PROPERTY

ESSENTIAL CIVIL AIR REGULATIONS

FOR THE CONTROL TOWER OPERATOR (PARTS 26 AND 60)

FOR THE AIRCRAFT DISPATCHER (PARTS 27, 40, AND 60)

CIVIL AIR REGULATIONS

PART 26—AIR-TRAFFIC CONTROL TOWER OPERATOR CERTIFICATES



WASHINGTON, D. C.

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AUTHORITY: §§ 26.1 to 26.36 issued under sec. 205, 52 Stat. 984; 49 U. S. C. 425. Interpret or apply secs. 601, 602, 52 Stat. 1007, 1008; 49 U. S. C. 551, 552.

QUALIFICATIONS FOR CERTIFICATE

§ 26.1 *Control-tower operator certificate requirements.* To be eligible for an air-traffic control-tower operator certificate an applicant shall comply with the following requirements:

(a) *Age.* 21 years is the minimum age for the issuance of a control-tower operator certificate; except that in the case of a person serving as a member of the military services of the United States, 18 years is the minimum age for the issuance of such a certificate: *Provided,* That certificates issued to members of the military services who are less than 21 years of age shall, until the holder thereof reaches the age of 21, be valid only when the holder is serving as a member of the military services in a control tower operated by such services.

(b) *Character.* An applicant shall be a person of good moral character.

(c) *Education.* An applicant shall be able to read, write, and understand the English language and to speak the English language without any accent or impediment of speech which would interfere with two-way radio conversation.

(d) *Citizenship.* An applicant for a control-tower operator certificate may be a citizen of any country or a person without nationality.

§ 26.2 *Physical condition.* Applicant shall meet the physical standards of the Second Class prescribed in Part 29 of this subchapter.

§ 26.3 *Knowledge.* An applicant must pass an examination on the following subjects:

NOTE: Lists of source material covering the subject matter of these examinations can be obtained from any Regional Manager of the Civil Aeronautics Administration.

(a) Air traffic rules set forth in Part 60 of this subchapter;

(b) Airport traffic control procedures, and this part;

(c) Airway traffic control procedures;

(d) Radio frequencies and procedures used for airport traffic control;

(e) Use of radio aids to air navigation;

(f) The making of weather observations; and

(g) Pertinent rules and regulations of the Federal Communications Commission. An applicant who presents satisfactory evidence that he possesses a restricted radiotelephone operator permit or higher grade of radiotelephone operator license issued by the Federal Communications Commission will not be required to take the examinations prescribed in this paragraph.

QUALIFICATIONS FOR RATINGS

§ 26.6 *Character of ratings.* The holder of an air-traffic control-tower operator certificate (hereinafter referred to as "certificate") may receive a junior or senior rating, depending upon his qualifications to perform the duties of an air-traffic control-tower operator (hereinafter referred to as "operator") at a particular airport.

§ 26.7 *Qualifications for junior rating.* An applicant must pass an examination on the following subjects:

(a) Local airport rules and characteristics of local air traffic of the airport for which the rating is sought;

(b) Local aircraft operations and such other aircraft operations as may affect conditions at the airport for which the rating is sought;

(c) Teletype symbols and weather sequences of the airways converging on the airport and other pertinent data regarding meteorological reports available within a circular area of a radius of 125 miles measured from the airport for which the rating is sought; and

(d) Any other subject or subjects in which the Administrator may deem an examination necessary. The applicant will be given adequate notice of the subject of the examination.

§ 26.8 *Qualifications for senior rating*—(a) *Knowledge.* An applicant must pass an examination on the subjects required for a junior rating and, in addition, the following subjects:

(1) Air navigation facilities within a radius of 200 miles of the airport for which the rating is sought;

(2) Airway traffic control procedures in the area in which the airport for which the rating is sought is located;

(3) Instrument approach and departure procedures at the airport for which the rating is sought; and

(4) Any other subject or subjects in which the Administrator may deem an examination necessary. The applicant

will be given adequate notice of the subject of the examination.

(b) *Experience.* An applicant must have performed satisfactory service:

(1) As an operator with a senior rating for at least 6 months; or

(2) As an operator with a junior rating at the airport for which the rating is sought for the 6 months immediately preceding application; or

(3) As an air-traffic control trainee in Federal service for at least 6 months; or

(4) For 1 year of the 2 years immediately preceding application as:

(i) An operator with a junior rating at an airport other than that at which the rating is sought; or

(ii) An operator at a landing area under military or naval jurisdiction.

(c) *Other requirements.* The applicant must demonstrate his ability to supervise and manage all activities of the airport control tower or airport control station, which shall at least include the preparation of such reports as may be required from time to time by the airport manager or the Administrator.

EXAMINATIONS

§ 26.12 *General.* The prescribed examinations will be conducted by representatives of the Administrator at a designated time and place.

§ 26.13 *Physical examinations.* (a) The prescribed physical requirements must be met before any practical or theoretical examination will be given and must be completed within the 12 months immediately preceding application for a certificate.

(b) In lieu of a physical examination conducted by an authorized medical examiner of the Administrator, a form acceptable to the Administrator, signed by a medical officer on duty with the Army, Navy, Marine Corps, or Coast Guard who is authorized to conduct physical examinations for flying, stating that the applicant is an active member of his service and has met within the preceding 12 months the physical requirements prescribed by § 26.2.

§ 26.14 *Re-examination after failure.* An applicant who has failed any prescribed written or practical examination or test may not apply for re-examination within a 30-day period unless he presents a statement signed by a certificated air-traffic control-tower operator, a certificated ground instructor, or an equally qualified individual acceptable to the Administrator, which attests that the applicant has received an additional 5 hours of instruction in each of the subjects failed and that the applicant is considered competent for re-examination.

ISSUANCE AND EXPIRATION OF CERTIFICATES

§ 26.18 *Duration.* (a) An air-traffic control-tower operator certificate issued to a United States citizen shall remain in effect until surrendered, suspended, revoked, or otherwise terminated by order of the Board. A certificate issued to an applicant other than a United States citizen shall remain in effect for a period no longer than 12 months after the date of issuance, but it may be reissued without further demonstration of technical competence.

(b) After revocation, and upon request after suspension, the certificate shall be returned to the Administrator.

(c) Nothing in this section shall be construed to deny or defeat the jurisdiction of the Federal courts, the Administrator, or the Board to impose any authorized sanction, including revocation of the certificate, for a violation of the act or of the Civil Air Regulations occurring during the effective period of the certificate.

§ 26.19 *Temporary certificates.* The Administrator or his authorized representative may issue a temporary air-traffic control-tower operator certificate for a period of not to exceed 90 days, subject to the terms and conditions specified therein by the Administrator.

§ 26.20 *Change of address.* Within 30 days after any change in the permanent mailing address of the holder of an air-traffic conrol-tower operator certificate, he shall notify the Administrator in writing of his new address. This notice shall be mailed to the Administrator of Civil Aeronautics, attention Airman Records Branch, Washington 25, D. C.

REGULATIONS

§ 26.25 *Rating record.* A certificated operator shall not serve as such unless there is attached to his certificate the appropriate rating record prescribed and issued by the Administrator, nor serve otherwise than in accordance with the limitations prescribed by the Administrator in his certificate or rating record.

NOTE: The rating record is a sheet which will be attached to all certificates when they are issued and will prescribe the airports at which the holder is authorized to serve and the class of rating held.

§ 26.26 *Exercise of authority.* A certificated air-traffic control-tower operator shall control traffic in accordance with the procedures and practices prescribed by the Administrator to provide for the safe, orderly, and expeditious flow of air traffic and in accordance with the following requirements:

(a) When weather conditions are equal to or better than the basic minimums prescribed for VFR flight by Part 60 of this subchapter, air traffic may be controlled by an operator with either a junior or senior rating for the airport involved: *Provided,* That where the Administrator finds the volume or character of the air traffic, the type and equipment of aircraft utilizing the airport, or the airport facilities require that an operator with a junior rating be supervised, he may require all air traffic at such airport to be controlled under the supervision of an operator with a senior rating.

(b) When weather conditions are below the basic minimums prescribed for VFR flight by Part 60 of this subchapter, air traffic shall be controlled by an operator with a senior rating, and such operator shall not issue an air traffic clearance for flight without prior authorization from the appropriate air-traffic control center.

(c) In an emergency an operator with a senior rating may delegate his authority to an operator with a junior rating.

§ 26.27 *Relaying information.* An operator shall not relay information or instructions received from airway traffic control personnel, airway communications, or United States Weather Bureau airport stations, otherwise than in the manner approved by the Administrator.

§ 26.28 *Maximum hours.* Except in case of an emergency, a certificated operator shall be relieved of all duty for not less than 24 consecutive hours at least once during each 7 consecutive days, and shall not serve, nor be required to serve as such:

(a) In excess of 10 consecutive hours;

(b) In excess of 10 hours during a period of 24 consecutive hours unless the operator is given a rest period of not less than 8 hours at or before the termination of such 10 hours of duty.

§ 26.29 *Display of certificate.* An operator shall keep his certificate readily available when he is on duty and shall present it for inspection upon request of any officer or employee of the Administrator or Board and of any State, municipal official charged with the duty of enforcing local laws or regulations involving Federal compliance.

§ 26.30 *Medical certificate.* A medical certificate issued by an authorized medical examiner of the Administrator or other evidence satisfactory to the Administrator that the air-traffic control-tower operator has met the physical requirements prescribed in this part shall be carried by such airman while on duty.

§ 26.31 *Equipment standards.* A certificated air-traffic control-tower operator shall not control air traffic with facilities which the Administrator has determined to be inadequate.

§ 26.32 *Inspection.* An applicant or a holder of a certificate or rating, upon reasonable request by any representative of the Administrator, shall cooperate fully in any examination which may be made of him.

§ 26.34 *Periodic physical examination.* The holder of an air-traffic control-tower operator certificate shall not exercise the privileges thereunder unless within the preceding 12 calendar months he has met the physical standards of the Second Class prescribed in Part 29 of this subchapter by passing an examination conducted by an authorized medical examiner of the Administrator.

§ 26.35 *Operation during physical deficiency.* A certificated air-traffic control-tower operator shall not serve as such during the period of any known physical deficiency which would render him unable to meet the physical requirements prescribed for the original issuance of his certificate: *Provided,* That if the deficiency is of a temporary nature, he may perform any duties not affected thereby when there is present and on duty another certificated and properly qualified air-traffic control-tower operator.

PART 27—AIRCRAFT DISPATCHER CERTIFICATES

WASHINGTON, D. C.

TITLE 14—CIVIL AVIATION

Subchapter A—Civil Air Regulations

PART 27—AIRCRAFT DISPATCHER CERTIFICATES

REVISION OF PART

Adopted by the Civil Aeronautics Board at its office in Washington, D. C. on the 29th day of July 1958.

Part 27, adopted December 22, 1939, effective July 15, 1940, as amended, establishes the current requirements for the issuance of aircraft dispatcher certificates. Since that time other airman parts have been revised and are now different from Part 27 in format and terminology. It is, therefore, desirable to revise Part 27 to make it conform more closely to the newer airman parts.

Two Civil Air Regulations Draft Releases were issued entitled "Proposed Revision of Part 27 of the Civil Air Regulations—Aircraft Dispatcher Certificates." The first was Draft Release 55–22, dated October 31, 1955. The second was Draft Release 57–22, dated October 2, 1957, which was published in the FEDERAL REGISTER on October 8, 1957. Both draft releases proposed changes to clarify the section pertaining to skill, to make changes in the experience requirements, and to delete the recent experience requirements.

The more significant changes are as follows:

1. *Experience.* The current aeronautical experience requirements preclude the possibility of a person's securing an aircraft dispatcher certificate when serving in other than scheduled air carrier or scheduled military operations. This revision broadens the base of experience which may be credited toward qualification for a certificate by recognizing the fact that some operators other than scheduled air carriers have established well-organized dispatch organizations through which they exercise dispatch control over the operation of their aircraft, even though not required to do so by the Civil Air Regulations. It is hoped that the recognition of this experience will serve to encourage the voluntary establishment of dispatch organizations in aircraft operations other than scheduled air carrier operations.

2. *Knowledge.* The paragraph in the present aeronautical knowledge section dealing with the characteristics of an aircraft used in air carrier operations has been moved to the section pertaining to skill. This has been done because an applicant's competence in this regard can better be determined from the practical rather than the written examination.

3. *Skill.* This section has been rewritten to present clearly the aircraft characteristics with respect to which the applicant will be required to take a practical examination. The specific reference to the Morse code has been deleted since an applicant in complying with the knowledge requirements would demonstrate sufficiently his familiarity with the code.

4. *Recent experience requirements.* Airman training and recent experience requirements applicable to aircraft dispatchers are contained in certain of the air carrier operating parts of the Civil Air Regulations. It is appropriate that these requirements should continue to be contained in the air carrier operating parts since specialized recent experience with respect to the carrier's authorized routes and the particular types of aircraft used is needed by the dispatcher so that he can perform his assigned duties in a competent manner. On the other hand, the recent experience requirements contained in present Part 27 are general in nature and may not be pertinent to the specific duties to which dispatchers are assigned. Furthermore, they are not considered necessary in view of the more specialized requirements contained in the operating parts of the Civil Air Regulations. Therefore, the current recent experience requirements are deleted from this part. This deletion will in no way affect the training program and recent experience requirements prescribed in the operating parts.

Interested persons have been afforded an opportunity to participate in the revision of this part (22 F. R. 8006), and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, the Civil Aeronautics Board hereby revises Part 27 of the Civil Air Regulations (14 CFR Part 27, as amended) as follows, effective November 1, 1958.

APPLICABILITY AND DEFINITIONS

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27.1 Applicability of this part.
27.2 Definitions.

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27.7 Duration.
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27.23 Education.
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27.31 Experience.
27.32 Knowledge.
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OPERATING RULES

Sec.
27.41 Certificate required.
27.42 Display.

AUTHORITY: §§ 27.1 to 27.42 issued under sec. 205, 52 Stat. 984, as amended; 49 U. S. C. 425. Interpret or apply secs. 601, 602, 52 Stat. 1007, 1008, as amended; 49 U. S. C. 551, 552.

APPLICABILITY AND DEFINITIONS

§ 27.1 *Applicability of this part.* This part establishes certification and general operating rules for aircraft dispatchers.

§ 27.2 *Definitions.* As used in this part, terms are defined as follows:

Administrator. The "Administrator" is the Administrator of Civil Aeronautics.

Air carrier. An "air carrier" is any citizen of the United States who undertakes directly, or by lease or by other arrangement, the carriage by aircraft of persons or property as a common carrier for compensation or hire, or the carriage of mail by aircraft.

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.

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

Authorized representative of the Administrator. An "authorized representative of the Administrator" is any employee of the Civil Aeronautics Administrator or any private person, authorized by the Administrator to perform particular duties of the Administrator under the provisions of this part.

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).

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

Pilot in command. The "pilot in command" is the pilot responsible for the operation and safety of the aircraft during the time defined as flight time.

CERTIFICATION RULES

§ 27.5 *Application for certificate.* An application for a certificate shall be made on a form and in a manner prescribed by the Administrator.

§ 27.6 *Issuance.* (a) An aircraft dispatcher certificate shall be issued by the Administrator to an applicant who meets the requirements of this part.

(b) Pending a review of an applicant's application and supplementary documents and the issuance of a certificate by the Administrator, an authorized representative of the Administrator may, subject to such conditions and limitations as the Administrator may prescribe, issue a temporary aircraft dispatcher certificate to an applicant who meets the requirements of this part.

§ 27.7 *Duration.* (a) An aircraft dispatcher certificate issued to a United States citizen shall remain in effect until surrendered, suspended, revoked, or otherwise terminated by order of the Board. A certificate issued to an applicant other than a United States citizen shall remain in effect for a period no longer than 12 months after the date of issuance; however, it may be reissued without further demonstration of technical competence.

(b) A temporary aircraft dispatcher certificate shall remain in effect for a period no longer than 90 days after the date of issuance.

(c) After revocation, and upon request after suspension, the certificate shall be returned to the Administrator.

§ 27.8 *Change of address.* Within 30 days after any change in the permanent mailing address of a certificated aircraft dispatcher, he shall notify the Administrator in writing of his new address. This notice shall be mailed to the Administrator of Civil Aeronautics, attention Airman Records Branch, Washington 25, D. C.

GENERAL CERTIFICATE REQUIREMENTS

§ 27.21 *Citizenship.* An applicant for an aircraft dispatcher certificate may be a citizen of any country or a person without nationality.

§ 27.22 *Age.* 23 years is the minimum age for the issuance of an aircraft dispatcher certificate.

§ 27.23 *Education.* An applicant shall be able to read, speak, and understand the English language, or an appropriate operation limitation shall be placed on his aircraft dispatcher certificate.

§ 27.24 *Examinations and tests.* Examinations and tests shall be conducted by an authorized representative of the Administrator at such times and places as the Administrator may designate. The passing grade for such examinations and tests shall be at least 70 percent.

§ 27.25 *Re-examination after failure.* An applicant who has failed any prescribed written or practical examination or test may not apply for re-examination within a 30-day period from the date of such failure unless he presents a statement signed by a certificated aircraft dispatcher, an appropriately rated and certificated ground instructor, or an authorized representative of the Administrator, which attests that the applicant has received an additional 5 hours of instruction in each of the subjects failed and that the applicant is considered competent for re-examination.

§ 27.26 *Substantiation of experience.* An applicant shall present to the Administrator satisfactory documentary evidence to substantiate the experience qualifications for an aircraft dispatcher certificate.

QUALIFICATIONS FOR A CERTIFICATE

§ 27.31 *Experience.* (a) An applicant shall have served for a total of 2 of the 3 years immediately preceding the date of application in scheduled air carrier operations, scheduled military operations, or in other aircraft operations which the Administrator finds provides equivalent experience as:

(1) A pilot member of the crew, or

(2) A flight radio operator or ground radio operator, or

(3) A flight navigator, or

(4) A meteorologist, or

(5) An individual or an assistant performing the functions of an aircraft dispatcher, or

(6) An individual performing other functions which the Administrator finds provides equivalent experience; or

(b) An applicant shall have served for at least 2 of the 3 years immediately preceding the date of application as an air route traffic controller or as a certificated air-traffic control-tower operator; or

(c) An applicant shall have served for at least one of the 2 years immediately preceding the date of application as an assistant in the dispatching of scheduled air carrier aircraft performing all the duties of an aircraft dispatcher under the direct supervision of a certificated aircraft dispatcher; or

(d) An applicant, within 90 days immediately preceding the date of application, shall have completed successfully a course of instruction which the Administrator approves as adequate for the training of an aircraft dispatcher.

(e) An applicant may credit any combination of experience in paragraph (a) or in paragraphs (a) and (b) of this section provided that the aggregate of such experience is at least 2 years.

§ 27.32 *Knowledge.* An applicant shall satisfactorily pass a written examination on the following subjects:

(a) The provisions of the Civil Air Regulations applicable to the duties of an aircraft dispatcher;

(b) The general system of collection and dissemination of weather information;

(c) The interpretation of aviation weather reports, including the abbreviations and symbols employed therein, as prescribed in Department of Commerce Weather Bureau Circular N (Instructions for Airway Meteorological Service), as amended;

(d) The fundamentals of meteorology as applied to aircraft operations, with particular reference to:

(1) Surface and upper air weather maps and the general characteristics of air masses, pressure systems, and frontal systems, including the symbols and nomenclature pertaining thereto,

(2) Cloud forms and their significance,

(3) Icing,

(4) Turbulence,

(5) Thunderstorms,

(6) Fog and low ceilings,

(7) Winds aloft,

(8) Pressure pattern flying,

(9) Influence of terrain on meteorological conditions, and

(10) General principles of forecasting and analysis;

(e) Principles of aircraft navigation with particular respect to instrument operation and procedures;

(f) Communications facilities and procedures;

(g) Air navigation facilities and procedures; and

(h) Air traffic control procedures.

§ 27.33 *Skill.* An applicant shall satisfactorily pass a practical examination on at least the following:

(a) With respect to one type of large aircraft used in air carrier operations:

(1) Weight and balance limitations;

(2) Performance operating limitations;

(3) Use of cruise control charts; and

(4) Fuel and oil capacities and rates of consumption.

(b) The characteristics of air routes and airports with particular reference to:

(1) Landing areas;

(2) Lighting facilities; and

(3) Approach and landing facilities and procedures.

(c) The use and limitations of sensitive type altimeters.

(d) The application of available weather forecasts and reports for purposes of determining whether a flight can be made with safety.

(e) The dispatch and assistance of a flight under adverse weather conditions.

(f) Emergency procedures.

OPERATING RULES

§ 27.41 *Certificate required.* No individual shall serve as an aircraft dispatcher in connection with any civil aircraft used in air commerce without, or in violation of the terms of, a certificate required by the Civil Air Regulations and issued in accordance with the provisions of this part. He shall have his certificate in his personal possession when performing his duties.

§ 27.42 *Display.* An aircraft dispatcher shall, upon request, present his airman certificate for examination by any authorized representative of the Civil Aeronautics Board or the Administrator, or by any State or local law enforcement officer.

PART 40

SCHEDULED INTERSTATE AIR CARRIER CERTIFICATION AND OPERATION RULES

New amendments to Part 40 are on pages 26 and 27 of this supplement. An asterisk (*) indicates paragraphs which have been amended. Material with a dashed line through it has been made obsolete or eliminated by the new amendments on pages 26 and 27.

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40.1 Applicability of this part.
40.2 Applicability of Parts 43 and 60 of this subchapter.
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12 Application for certificate.
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REQUIRED RECORDS AND REPORTS

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40.501 Crew member and dispatcher records.
40.502 List of airplanes.
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40.505 Disposition of load manifest, dispatch release form, and flight plans.
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40.511 Maintenance release.

AUTHORITY: §§ 40.1 to 40.511 issued under sec. 205, 52 Stat. 984; 49 U. S. C. 425. Interpret or apply secs. 601, 604, 605, 52 Stat. 1007, 1010, as amended; 49 U. S. C. 551, 554, 555.

APPLICABILITY AND DEFINITIONS

§ 40.1 *Applicability of this part.* The provisions of this part are applicable to air carriers holding certificates of public convenience and necessity issued in accordance with Title IV of the Civil Aeronautics Act of 1938, as amended, when they engage in scheduled interstate air transportation within the continental limits of the United States: *Provided,* That the provisions of this part shall not apply to operations conducted pursuant to economic exemption authority issued by the Board for a period of 90 days or less: *And provided further,* That the Administrator may authorize any air carrier holding authority to engage in scheduled cargo operations pursuant to Title IV of the Civil Aeronautics Act of 1938, as amended, to conduct such operations in accordance with the air carrier certification and operations rules prescribed in Part 42 of this subchapter: *And provided further,* That in the case of segments of routes extending beyond the continental limits of the United States the Administrator may authorize an air carrier to conduct operations over such route segments pursuant to provisions of this part.

§ 40.2 *Applicability of Parts 43 and 60 of this subchapter.* The provisions of Parts 43 and 60 of this subchapter shall be applicable to all air carrier operations conducted under the provisions of this part unless otherwise specified in this part.

§ 40.5 *Definitions.* As used in this part terms shall be 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 Civil Aeronautics.

Air carrier. An air carrier is any citizen of the United States who undertakes directly, or by lease or by other arrangement, the carriage by airplane of persons or property as a common carrier for compensation or hire, or the carriage of mail by airplane.

Air traffic clearance. An air traffic clearance is an authorization issued by air traffic control for an airplane to proceed under specified conditions.

Air traffic control. Air traffic control is a service provided for the purpose of: (1) Preventing collisions between airplanes, and, on the airport ground maneuvering area, between airplanes and obstructions; and (2) expediting and maintaining an orderly flow of air traffic.

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

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

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

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

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

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

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

Authorized representative of the Administrator. An authorized representative of the Administrator is any employee of the Civil Aeronautics Administration or any private person, authorized by the Administrator to perform particular duties of the Administrator under the provisions of this part.

Ceiling. Ceiling is the height above the ground or water of the lowest layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration" and not classified as "thin" or "partial."

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

Control area. Control area is airspace having defined dimensions, designated by the Administrator, which extends upward from an altitude of 700 feet above the surface, within which air traffic control is exercised. In the case of operations conducted in the airspace of a foreign country, control area shall mean the airspace designated by the appropriate authority of such country.

Control zone. A control zone is airspace having defined dimensions, designated by the Administrator, which extends upward from the surface, which

includes one or more airports, and within which rules additional to those governing control areas apply for the protection of air traffic. In the case of control zones located in foreign countries, the control zone shall be designated by the appropriate authority of such country.

Crew member. A crew member is any individual assigned by an air carrier for the performance of duty on an airplane in flight.

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

Critical-engine-failure speed, V_1 (transport category airplanes). The critical-engine-failure speed is the airplane speed used in the determination of the take-off 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 release. A dispatch release is an authorization issued by an air carrier specifying the conditions for the origination or continuance of a particular flight.

Duty aloft. Duty aloft includes the entire period during which an individual is assigned as a member of an airplane crew during flight time.

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

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

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

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

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 crew member. A flight crew member is a crew member assigned to duty on an airplane as a pilot or flight engineer.

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

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

High-altitude operation. High-altitude operation is flight conducted at or above 12,500 feet above sea level east of longitude 100° W. and at or above 14,500 feet above sea level west of longitude 100° W.

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

Interstate air transportation. Interstate air transportation is the carriage by airplane of persons or property as a common carrier for compensation or hire or the carriage of mail by airplane, in commerce between a place in any State of the United States, or the District of Columbia, and a place in any other State of the United States, or the District of Columbia; or between places in the same State of the United States, or the District of Columbia; whether such commerce moves wholly by airplane or partly by airplane and partly by other forms of transportation.

Maximum certificated take-off weight. Maximum certificated take-off weight is the maximum take-off weight authorized by the terms of the airplane airworthiness certificate.

NOTE: The airplane airworthiness certificate incorporates as a part thereof the airplane operating record or that portion of an Airplane Flight Manual which contains the pertinent limitation.

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 Civil Aeronautics Administration or the United States Weather Bureau.

Obstruction clearance area—(1) *Take-off.* A take-off obstruction clearance area as used in the take-off operating limitations for nontransport category airplanes is an area on the earth's surface defined as follows: The center line of the obstruction clearance area in plan view shall coincide with and prolong the center line of the runway, beginning at the point where the obstruction clearance plane intersects the center line of the runway and proceeding to a point not less than 1,500 feet from the beginning point. Thereafter the center line shall proceed in a path consistent with the take-off 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 center line 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 center line 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 center line.

(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 center line of the obstruction clearance area in plan view shall coincide with and prolong the center line of the runway, beginning at the point where the obstruction clearance plane intersects the center line of the runway and proceeding to a point not less than 1,500 feet from the beginning point. Thereafter the center line 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 center line 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 center line 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 center line.

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

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

Operations Specifications. Operations specifications are rules of particular applicability issued by the Administrator under delegated authority from the Board and are not part of the air carrier operating certificate.

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

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

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

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

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

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

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

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

Route. A route is the airspace on either side of a course joining those points on the surface of the earth between which an air carrier provides air transportation in accordance with the terms of its certificate of public convenience and necessity issued by the Board.

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

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

Scheduled for duty aloft. Scheduled for duty aloft means the assignment of a flight crew member on the basis of the flight time established in the operations schedules rather than the actual flight time.

Show. Show means to demonstrate or prove to the satisfaction of the Administrator prior to the issuance of the air carrier operating certificate and at any time thereafter required by the Administrator.

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

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

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

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

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

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

V_{s_0}, V_{s_0} is the symbol used to designate the true indicated stalling speed or the minimum steady flight speed in the landing configuration.

Visibility. Visibility is the greatest distance at which conspicuous objects can be seen and identified.

(1) *Flight visibility.* Flight visibility is the average range of visibility forward from the cockpit of an airplane in flight to see and identify prominent unlighted objects by day and prominent lighted objects by night.

(2) *Ground visibility.* Ground visibility is the visibility at the earth's surface as reported by the United States Weather Bureau or by a source approved by the Weather Bureau.

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

§ 40.10 *Certificate required.* No person subject to the provisions of this part shall operate an airplane in scheduled interstate air transportation without, or in violation of the terms of, an air carrier operating certificate issued by the Administrator.

§ 40.11 *Contents of certificate.* An air carrier operating certificate shall specify the points to and from which, and the routes over which, an air carrier is authorized to operate.

§ 40.12 *Application for certificate.* An application for an air carrier operating certificate shall be made in the form and manner and contain information prescribed by the Administrator.

§ 40.13 *Issuance of certificate.* (a) An air carrier operating certificate shall be issued by the Administrator to an applicant having a certificate of public convenience and necessity issued by the Civil Aeronautics Board when the Administrator finds, after investigation, that such person is properly and adequately equipped and able to conduct a safe operation in accordance with the requirements of this part and with the operations specifications authorized in this part.

(b) Whenever, upon investigation, the Administrator finds that the general standards of safety required for air carrier operations in airplanes of 12,500 pounds or less maximum certificated take-off weight, or for air carrier operations conducted pursuant to a temporary authorization issued under Title IV of the Civil Aeronautics Act of 1938, as amended, require or permit a deviation from any specific requirement for particular operation or class of operations for which an application for an air carrier operating certificate has been made, he may issue operations specifications prescribing requirements which deviate from the requirements of this part. The Administrator shall promptly notify the Board of such deviations in the operations specifications and the reasons therefor.

§ 40.14 *Amendment of certificate.* (a) The Administrator shall, after notice and opportunity for hearing to the carrier concerned, amend an air carrier operating certificate when he finds that such amendment is reasonably required in the interest of safety.

(b) Upon application by an air carrier the Administrator shall amend an air carrier operating certificate when he finds that the general standards of safety permit such an amendment.

§ 40.15 *Display of certificate.* The air carrier operating certificate shall be available at the principal operations office of an air carrier for inspection by any authorized representative of the Board or the Administrator.

§ 40.16 *Duration of certificate.* (a) An air carrier operating certificate shall remain in effect until termination of the certificate of public convenience and necessity or other economic authorization issued by the Board held by the air carrier, or until surrendered, suspended, revoked, or otherwise terminated by order of the Board. After suspension or revocation it shall be returned to the Administrator.

(b) Nothing in this section shall be construed to deny or to defeat the jurisdiction of the Federal courts, the Administrator, or the Board to impose any authorized sanction, including revocation of the certificate, for a violation of the Civil Aeronautics Act of 1938, as amended, regulations in this subchapter, or the air carrier operating certificate occurring during the effective period of such certificate.

§ 40.17 *Transferability of certificate.* An air carrier operating certificate is not transferable, except with the written consent of the Administrator.

§ 40.18 *Operations specifications required.* (a) No person subject to the provisions of this part shall operate as an air carrier without, or in violation of, operations specifications issued by the Administrator.

(b) New or amended specifications shall be issued by the Administrator for operations subject to this part in a form and manner prescribed by him and in accordance with the provisions of this part.

§ 40.19 *Contents of specifications.* The operations specifications shall contain the following:

(a) Types of operations authorized;

(b) Types of airplanes authorized for use;

(c) En route authorizations and limitations;

(d) Airport authorizations and limitations;

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

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

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

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

§ 40.20 *Utilization of operations specifications.* The air carrier shall keep its personnel informed with respect to the contents of the operations specifications and all amendments thereto applicable to the individual's duties and responsibilities. A set of specifications shall be maintained by the air carrier as a separate and complete document. Pertinent excerpts from the specifications or references thereto shall be inserted in the manual issued by the air carrier.

§ 40.21 *Amendment of operations specifications.* Any operations specification may be amended by the Administrator if he finds that safety in air transportation so requires or permits. Except in the case of an emergency requiring immediate action in respect to safety in air transportation or upon consent of the air carrier concerned, no amendment shall become effective prior to thirty days after the date the air carrier has been notified of such amendment. Within thirty days after either the receipt of such notice or the refusal of the Administrator to approve an air carrier's application for amendment, the air carrier may petition the Board to review the action of the Administrator. Except with regard to emergency amendments by the Administrator, the effectiveness of any amendment concerning which the carrier has petitioned for review shall be stayed pending the Board's decision.

§ 40.22 *Inspection authority.* An authorized representative of the Board or the Administrator shall be permitted at any time and place to make inspections or examinations to determine an air carrier's compliance with the requirements of the Civil Aeronautics Act of 1938, as amended, the regulations in this subchapter, the provisions of the air carrier's operating certificate, and the operations specifications.

§ 40.23 *Operations and maintenance base and office.* Each air carrier shall give written notice to the Administrator of his principal business office, his principal operations base, and his principal maintenance base. Thereafter, prior to any change in any such office or base, he shall give written notice to the Administrator.

REQUIREMENTS FOR SERVICES AND FACILITIES

* § 40.30 *Route requirements; demonstration of competence.* The air carrier shall show that it is competent to conduct scheduled operations over any route or route segment between any regular, provisional, or refueling airport and that the facilities and services available are adequate for the type of operation proposed. The Administrator shall not require actual flight over a route or route segment, if the air carrier shows that such flight is not essential to safety. The air carrier may thereafter conduct operations between regular, provisional, or refueling airports on any approved route or routes on which the operational facilities and procedures are substantially similar: *Provided,* That high-altitude operations may be conducted over any route.

* § 40.31 *Width of routes.* A route or route segment shall include the navigable airspace on each side of an approved course or courses, and it shall have a width designated by the Administrator consistent with terrain, available navigational aids, traffic density, and air traffic control procedures: *Provided,* That for high-altitude operations, courses need not be approved, and the width of navigable airspace on each side thereof need not be designated by the Administrator.

* § 40.32 *IFR routes outside of control areas.* IFR routes outside of control areas shall be approved if the air carrier shows that the navigational and communications facilities are adequate for the operations proposed, unless the Administrator finds that because of traffic density an adequate level of safety cannot be insured in a particular area: *Provided,* That for high-altitude operations IFR routes need not be approved.

§ 40.33 *Airports.* The air carrier shall show that each route has sufficient airports found by the Administrator to be properly equipped and adequate for the type of operations to be conducted. Consideration shall be given to items such as size, surface, obstructions, facilities, public protection, lighting, navigational and communications aids, and traffic control.

§ 40.34 *Communications facilities.* The air carrier shall show that a two-way air/ground radio communication system is available at such points as will insure reliable and rapid communications under normal operating conditions over the entire route, either direct or via approved point-to-point circuits for the following purposes:

(a) Communications between airplanes and the appropriate dispatch office, in which case such systems shall be independent of systems operated by the Federal Government, and

(b) Communications between airplanes and the appropriate air traffic control unit, in which case the Administrator may permit the use of communications systems operated by the Federal Government.

* § 40.35 *Weather reporting facilities.* The air carrier shall show that sufficient weather reporting services are available along the route to insure weather reports and forecasts necessary for the operation. Weather reports used to control flight movements shall be those prepared and released by the U. S. Weather Bureau, or by a source approved by the Weather Bureau. Forecasts used to control flight movements shall be prepared from such weather reports.

§ 40.36 *En route navigational facilities.* The air carrier shall show that nonvisual ground aids to air navigation are available along each route, that they are so located as to permit navigation to any regular, provisional, refueling, or alternate airport within the degree of accuracy necessary for the operation involved, and that they are available for the navigation of airplanes within the degree of accuracy required for air traffic control: *Provided,* That no nonvisual ground aids to navigation are required for day VFR operations where the characteristics of the terrain are such that navigation can be conducted by pilotage, or for night VFR operations along lighted airways or on routes where the Administrator has determined that reliably lighted landmarks are adequate for safe operations.

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

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

MANUAL REQUIREMENTS

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

§ 40.51 *Contents of manual.* (a) The manual shall contain instructions, information, and data necessary for the per-

sonnel 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, operations specifications, or the operating certificate. The manual may be in two or more separate parts (e. g., flight operations, ground operations, maintenance, communications, etc.) to facilitate use by the personnel concerned, but each part shall contain so much of the information listed below as is appropriate for each group of personnel:

(1) General policies;

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

(3) Reference to appropriate regulations in this subchapter and Civil Aeronautics Manuals;

(4) Flight dispatching and control;

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

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

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

(8) Take-off, en route, and landing weight limitations;

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

(10) Emergency procedures and equipment;

(11) The method of designating succession of command of flight crew members;

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

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

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

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

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

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

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

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

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

(21) Accident notification procedures; and

(22) Other data or instructions related to safety.

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

§ 40.52 *Distribution of manual.* (a) Copies of the entire manual, or appropriate portions thereof, together with revisions thereto shall be furnished to the following:

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

(2) Flight crew members; and

(3) Authorized representatives of the Administrator assigned to the air carrier to act as aviation safety agents.

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

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

(b) An approved Airplane Flight Manual or a manual complying with § 40.50 and containing information required for the Airplane Flight Manual shall be carried in each transport category airplane.

AIRPLANE REQUIREMENTS

* § 40.60 *General.* Airplanes shall be identified, certificated, and equipped in accordance with the applicable airworthiness requirements of the regulations in this subchapter. No air carrier shall operate any airplane in scheduled operation unless such airplane meets the requirements of this part and is in an airworthy condition.

§ 40.61 *Airplane certification requirements*—(a) *Airplanes certificated on or before June 30, 1942.* Airplanes certificated as a basic type on or before June 30, 1942, shall either:

(1) Retain their present airworthiness certification status and meet the requirements of § 40.90, or

(2) Comply with either the performance requirements of §§ 4a.737–T through 4a.750–T of this subchapter or the performance requirements of §§ 4b.110 through 4b.125 of this subchapter and in addition shall meet the requirements of § 40.70: *Provided,* That should any type be so qualified, all airplanes of any one operator of the same or related types shall be similarly qualified and operated.

(b) *Airplanes certificated after June 30, 1942.* Airplanes certificated as a basic type after June 30, 1942, and used in passenger operation shall be certificated as transport category airplanes and shall meet the requirements of § 40.70.

§ 40.62 *Airplane limitation for type of route.* All airplanes used in passenger air transportation shall be multiengine airplanes and shall comply with the following requirements:

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

(b) *Land airplanes on extended overwater routes.* Land airplanes operated on flights involving extended overwater operations shall be certificated as adequate for ditching in accordance with the ditching provisions of Part 4b of this subchapter.

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

(b) A type of airplane which has been previously proved shall be tested for at least 50 hours, of which at least 25 hours shall be flown over authorized routes, unless deviations are specifically authorized by the 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 airplane:

(1) Is materially altered in design, or

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

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

AIRPLANE PERFORMANCE OPERATING LIMITATIONS; TRANSPORT CATEGORY

§ 40.70 *Transport category airplane operating limitations.* (a) In operating any passenger-carrying transport category airplane the provisions of §§ 40.71 through 40.78 shall be complied with, unless deviations therefrom are specifically authorized by the Administrator on the ground that the special circumstances of a particular case make a literal observance of the requirements unnecessary for safety.

(b) For transport category airplanes 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.

(c) No airplane shall be taken off at a weight which exceeds the allowable weight for the runway being used as determined in accordance with the take-off 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 subchapter, and set forth in the Airplane Flight Manual for the airplane.

§ 40.71 *Weight limitations.* (a) No airplane shall be taken off from any airport located at an elevation outside of the altitude range for which maximum take-off 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 take-off shall not exceed the authorized maximum take-off weight for the elevation of the airport from which the take-off is to be made.

(c) The weight at take-off 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.

§ 40.72 *Take-off limitations to provide for engine failure.* No take-off shall be made except under conditions which will permit compliance with the following requirements:

(a) It shall be possible, from any point in the take-off 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 take-off and attain a height of 50 feet, as indicated by the take-off 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 take-off 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 take-off 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 take-off surface. To allow for wind effect, take-off data based on still air may be corrected by not more than 50 percent of the reported wind component along the take-off path if opposite to the direction of take-off, and shall be corrected by not less than 150 percent of the reported wind component if in the direction of take-off.

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

§ 40.74 *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 subchapter, the rate of climb shall be $0.02\ V_{s_0}{}^2$.

(b) As an alternative to the provisions of paragraph (a) of this section, an air carrier may utilize an approved procedure whereby its airplanes are operated at an all-engine-operating altitude such that in the event of an engine failure the airplane can continue flight to an alternate airport where a landing can be made in accordance with the provisions of § 40.78, 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 subchapter and by $0.02\ V_{s_0}{}^2$ for airplanes certificated under Part 4a of this subchapter.

(2) The all-engine-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 take-off 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 the Administrator may authorize a procedure established on a different basis where adequate operational safeguards are found to 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 shall be permitted if the Administrator finds that the air carrier has an adequate training program, proper instructions are given to the flight crew, and all other precautions are taken to insure a safe procedure.

(6) The alternate airport shall be specified in the dispatch release and shall meet the provisions of § 40.390.

(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.

✻ § 40.75 *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 subchapter. No airplane having four or more engines shall be flown along an intended track except under the conditions of either paragraph (a) or paragraph (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 § 40.78, assuming all engines to be operating at cruising power.

(b) The take-off 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 take-off weight. In showing compliance with this prescribed rate of climb, the following shall apply:

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

engines are assumed to fail and with two engines operating beyond that point.

(2) Where the engines are assumed to fail at an altitude above the prescribed minimum altitude, compliance with the prescribed rate of climb at the prescribed minimum altitude need not be shown during the descent from the cruising altitude to an altitude at which the rate of descent becomes zero, if the latter is sufficiently above the prescribed minimum altitude to assure compliance with the prescribed rate of climb at the prescribed minimum altitudes during the subsequent portion of the flight.

(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 § 40.78 and to arrive there at an altitude of at least 1,000 feet directly over the landing area.

§ 40.76 *Special en route limitations.* The 10-mile lateral distance specified in §§ 40.73 through 40.75 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.

§ 40.77 *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 take-off 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 most favorable runway and direction in still air.

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

(c) If the airport of intended destination will not permit full compliance with paragraph (b) of this section, the airplane may be taken off if an alternate airport is designated which permits compliance with § 40.78.

§ 40.78 *Landing distance limitations; alternate airports.* No airport shall be designated as an alternate airport in a dispatch release unless the airplane at the weight anticipated at the time of arrival at such airport can comply with the requirements of § 40.77: *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

§ 40.90 *Nontransport category airplane operating limitations.* In operating any large, nontransport category airplane in passenger service, the provisions of §§ 40.91 through 40.94 shall be complied with, unless deviations therefrom are specifically authorized by the Administrator on the ground that the special circumstances of a particular case make a literal observance of the requirements unnecessary for safety. Performance data published or approved by the Administrator for each such nontransport category airplane shall be used in determining compliance with the provisions of §§ 40.91 through 40.94.

§ 40.91 *Take-off limitations.* No take-off 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 take-off up to the time of attaining 105 percent of minimum control speed or 115 percent of the power-off stalling speed in the take-off configuration, whichever is the greater. In applying the requirements of this section:

(a) It may be assumed that take-off 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 take-off path if opposite to the direction of take-off, and account shall be taken of not less than 150 percent of the reported wind component if in the direction of the take-off;

(c) Account shall be taken of the average runway gradient when the average gradient is greater than ½ percent. The average runway gradient is the difference between the elevations of the end points of the runway divided by the total length;

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

§ 40.92 *En route limitations; one engine inoperative.* (a) No take-off shall be made at a weight in excess of that which will permit the airplane to climb at a rate of at least 50 feet per minute with the critical engine inoperative at an altitude of at least 1,000 feet above the elevation of the highest obstacle within 5 miles on either side of the intended track or at an altitude of 5,000 feet, whichever is the higher: *Provided,* That in the alternative an air carrier may utilize a procedure whereby the airplane is operated at an altitude such that, in event of an engine failure, the airplane can clear the obstacles within 5 miles on either side of the intended track by 1,000 feet, if the air carrier can demonstrate to the satisfaction of the Administrator 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 performance information published or approved by the Administrator. Before approving such a procedure, 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 wing flaps and landing gear are in the most favorable positions;

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

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

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

§ 40.93 *Landing distance limitations; airport of intended destination.* No take-off 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 tail-wind 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.

§ 40.94 *Landing distance limitations; alternate airports.* No airport shall be designated as an alternate airport in a dispatch release unless the airplane at the weight anticipated at the time of arrival at such airport can comply with the requirements of § 40.93: *Provided,* That the airplane can be brought to rest within 70 percent of the effective length of the runway.

§ 40.110 *Fire prevention.* All airplanes used in passenger service, powered by engines rated at more than 600 horsepower each for maximum continuous operation and which have not been certificated in accordance with the provisions of Part 4b of this subchapter in effect on or after November 1, 1946, shall comply with the requirements contained in §§ 40.111 through 40.143: *Provided,* That if the Administrator finds that in particular models of existing airplanes literal compliance with specific items of these requirements might be extremely difficult of accomplishment and that such compliance would not contribute materially to the objective sought, he may accept such measures of compliance as he finds will effectively accomplish the basic objectives of these regulations.

§ 40.111 *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, me-resistant, flash-resistant, and nmable.

§ 40.112 *Cabin interiors.* All compartments occupied or used by the crew or passengers shall comply with the following provisions:

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

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

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

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

§ 40.113 *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.

§ 40.114 *Ventilation.* All passenger and crew compartments shall be suitably ventilated. Carbon monoxide concentration shall not exceed one part in 0,000 parts of air, and fuel fumes shall ot 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.

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

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

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

§ 40.116 *Proof of compliance.* Compliance with those provisions of § 40.115 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.

§ 40.117 *Propeller de-icing fluid.* If combustible fluid is used for propeller de-icing, the provisions of § 40.131 shall be complied with.

§ 40.118 *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.

§ 40.119 *Location of fuel tanks.* Location of fuel tanks shall comply with the provisions of § 40.132. 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.

§ 40.120 *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.

§ 40.121 *Fuel lines and fittings in designated fire zones.* Fuel lines and fittings in all designated fire zones (see § 40.131) shall comply with the provisions of § 40.134.

§ 40.122 *Fuel valves.* In addition to the requirements contained in § 40.133

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.

§ 40.123 *Oil lines and fittings in designated fire zones.* Oil lines and fittings in all designated fire zones (see § 40.131) shall comply with the provisions of § 40.134.

§ 40.124 *Oil valves.* Requirements of § 40.133 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.

§ 40.125 *Oil system drains.* Accessible drains shall be provided to permit safe drainage of the entire oil system and shall incorporate means for positive or automatic locking in the closed position. (See also § 40.135.)

§ 40.126 *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 § 40.135.)

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

§ 40.128 *Fire-wall construction.* Fire walls and shrouds shall be constructed in such a manner that no hazardous quantity of air, fluids, or flame can pass from the engine compartment to other portions of the airplane. All openings in the fire wall or shroud shall be sealed with close-fitting fireproof grommets, bushings, or fire-wall fittings. Fire walls and shrouds shall be constructed of fireproof material and shall be protected against corrosion. The following materials have been found to comply with this requirement:

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

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

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

§ 40.130 *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 § 40.128.

§ 40.131 *Powerplant fire protection.* Engine accessory sections, installations where no isolation is provided between the engine and accessory compartment, also regions wherein lie auxiliary power units, fuel-burning heaters, and other combustion equipment shall be referred to as designated fire zones. Such zones shall be protected from fire by compliance with §§ 40.132 through 40.135.

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

§ 40.133 *Shutoff means.* Means for each individual engine shall be provided for shutting off or otherwise preventing hazardous quantities of fuel, oil, de-icer, and other flammable fluids from flowing into, within, or through any designated fire zone, except that means need not be provided to shut off flow in lines forming an integral part of an engine. In order to facilitate rapid and effective control of fires, such shutoff means shall permit an emergency operating sequence which is compatible with the emergency operation of other equipment, such as feathering the propeller. Shutoff means shall be located outside of designated fire zones, unless equivalent safety is provided (see § 40.132), 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.

§ 40.134 *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.

§ 40.135 *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 § 40.134, if the Administrator finds that rupture or breakage of a particular drain or vent line may result in a fire hazard.

§ 40.136 *Fire-extinguishing systems.* (a) Unless it can be demonstrated 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.

§ 40.137 *Fire-extinguishing agent.* Extinguishing agents employed shall be methyl bromide, carbon dioxide, or any other agent which has been demonstrated to provide equivalent extinguishing action. If methyl bromide or any other toxic extinguishing agent is employed, provisions shall be made to prevent the entrance of harmful concentrations of fluid or fluid vapors into any personnel compartment either due to leakage during normal operation of the airplane or as a result of discharging the fire extinguisher on the ground or in flight when a defect exists in the extinguishing system. If a methyl bromide system is provided, the containers shall be charged with dry agent and shall be sealed by the fire-extinguisher manufacturer or any other party employing 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.

§ 40.138 *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.

§ 40.139 *Extinguishing agent container compartment temperature.* Precautions shall be taken to assure that the extinguishing agent containers are installed in locations where reasonable temperatures can be maintained for effective use of the extinguishing system.

§ 40.140 *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.

§ 40.141 *Fire-detector systems.* Quick-acting fire detectors shall be provided in all designated fire zones and shall be sufficient in number and location to assure the detection of fire which may occur in such zones.

§ 40.142 *Fire detectors.* Fire detectors shall be constructed and installed in such a manner as to assure 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.

§ 40.143 *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 center line 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.

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

§ 40.151 *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 Administrator finds that the fuel system incorporates features which provide equivalent safety.

§ 40.152 *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.

§ 40.153 *Carriage of cargo in passenger compartments.* When operating conditions require the carriage of cargo which cannot be loaded in approved cargo racks, bins, or compartments which are separate from passenger compartments, such cargo may be carried in a passenger compartment if the following requirements are complied with: *Provided,* That the Administrator, under a particular set of circumstances, may authorize deviations from these requirements when he finds that safety will not be adversely affected and that it is in the public interest to carry such cargo:

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

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

(c) It shall not be carried aft of or directly above seated passengers.

(d) It shall not impose any loads on seats or on the floor structure which exceed the designed loads for those components.

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

INSTRUMENTS AND EQUIPMENT FOR ALL OPERATIONS

§ 40.170 *Aircraft instruments and equipment for all operations.* (a) Instruments and equipment required by §§ 40.171 through 40.232 shall be approved and shall be installed in accordance with the provisions of the airworthiness requirements applicable to the instruments or equipment concerned.

(b) The following provisions apply to air-speed limitations, air-speed indicators, and related information:

(1) Air-speed limitations and related information contained in the Airplane Flight Manual and pertinent placards shall be expressed in the same units as used on the air-speed indicator.

(2) When more than one air-speed indicator is required, all such indicators shall be calibrated to read in the same units.

(3) When an air-speed indicator is calibrated in statute miles per hour, a readily usable means shall be provided for the flight crew to convert statute miles per hour to knots.

(4) On and after April 1, 1956, all air-speed indicators shall be calibrated in knots, and all air-speed 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 take-off, except as provided in § 40.391 (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 § 40.110 and §§ 40.150 through 40.153,

(2) Instruments and equipment specified in §§ 40.171 through 40.178 for all operations, and the instruments and equipment specified in §§ 40.200 through 40.232 for the type of operation indicated, wherever these items are not already provided in accordance with subparagraph (1) of this paragraph.

§ 40.171 *Flight and navigational equipment for all operations.* The following flight and navigational instruments and equipment are required for all operations:

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

(b) Sensitive altimeter;

(c) Clock (sweep-second);

(d) Free-air temperature indicator;

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

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

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

(h) Magnetic compass; and

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

§ 40.172 *Engine instruments for all operations.* The following engine instruments are required for all operations, except that 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 not equipped with an automatic altitude mixture control;

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

(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) Effective July 1, 1956, 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.

✱ § 40.173 *Emergency equipment for all operations*—(a) *General.* The emergency equipment specified in paragraphs (b), (c), and (d) of this section is required for all operations. Such 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 so marked as to be readily identifiable.

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

accordance with the following requirements:

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

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

(3) At least one hand fire extinguisher shall be conveniently located in the passenger compartment of airplanes accommodating more than six but less than 31 passengers. On airplanes accommodating more than 30 passengers, at least two fire extinguishers shall be provided. None need be provided in passenger compartments of airplanes accommodating six or less persons.

(c) *First-aid equipment.* First-aid equipment suitable for treatment of injuries likely to occur in flight or in minor accidents shall be provided in a quantity appropriate to the number of passengers and crew accommodated in the airplane.

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

(e) *Means for emergency evacuation.* After May 31, 1957, on all passenger-carrying airplanes, at all emergency exits which are more than 6 feet from the ground with the airplane on the ground and with the landing gear extended, means shall be provided to assist the occupants in descending from the airplane. At floor level exits approved as emergency exits, such means shall be a chute or equivalent device suitable for the rapid evacuation of passengers. During flight time this means shall be in a position for ready use: *Provided,* That the requirements of this paragraph do not apply to emergency exits over the wing where the greatest distance from the lower sill of the exit to the wing surface does not exceed 36 inches.

(f) *Interior emergency exit marking.* (1) After May 31, 1957, all 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) After May 31, 1957, for night operations, a source or sources of light, with an energy supply independent of the main lighting system, shall be installed to illuminate all emergency exit markings. Such lights shall be designed to function automatically in a crash landing and to continue to function thereafter and shall also be operable manually, or shall be designed only for manual operation and also to continue to function following a crash landing. When such lights require manual operation to function, they shall be turned on prior to each night take-off and landing.

§ 40.174 *Seats and safety belts for all occupants.* A seat and an individual safety belt are required for each passenger and crew member, excluding infants, who are in other than a recumbent position during take-off and landing. One safety belt only is required in a berth for one or two persons in a recumbent position during take-off and landing. During flight between take-off and landing, one safety belt is sufficient for two persons occupying a multiple lounge or divan seat.

§ 40.175 *Miscellaneous equipment for all operations.* All airplanes shall have installed the following equipment:

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

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

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

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

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

(f) Means for locking all companionway doors which separate passenger compartments from flight crew compartments. Keys for all doors which separate passenger compartments from other compartments having emergency exit provisions shall be readily available to all crew members. 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 take-off and landing. All doors which lead to compartments normally accessible to passengers and which are capable of being locked by passengers shall be provided with means for unlocking by the crew in the event of an emergency.

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

§ 40.176 *Cockpit check procedure.* The air carrier shall provide for each type of airplane a cockpit check procedure. This procedure shall include all items necessary for flight crew members to check for safety prior to starting engines, prior to taking off, prior to landing, and in engine emergencies. It shall be so designed as to obviate the necessity for a flight crew member to rely upon his memory for items to be checked and shall be readily usable in the cockpit of each airplane.

§ 40.177 *Passenger information for all operations.* All airplanes shall be equipped with signs visible to passengers and cabin attendants to notify such persons when smoking is prohibited and when safety belts should be fastened. These signs shall be capable of on-off operation by the crew.

§ 40.178 *Exterior exit and evacuation markings for all operations.* Effective January 1, 1956, 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.

INSTRUMENTS AND EQUIPMENT FOR SPECIAL OPERATIONS

* § 40.200 *Instruments and equipment for operations at night.* Each airplane operated at night shall be equipped with the following instruments and equipment in addition to those required by §§ 40.171 through 40.178:

(a) ~~Flashing~~ position lights;

(b) ~~After May 01, 1960,~~ an anti-collision light for airplanes having a maximum certificated weight of more than 12,500 pounds;

(c) Two landing lights;

(d) Two class 1 or class 1A landing flares;

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

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

(g) A sensitive altimeter.

§ 40.201 *Instruments and equipment for operations under IFR or over-the-top.* Each airplane operated under IFR or over-the-top shall be equipped with the following instruments and equipment in addition to those required by §§ 40.171 through 40.178:

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

(b) A sensitive altimeter; and

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

nondimming instrument lights are satisfactory.

§ 40.202 *Supplemental oxygen*—(a) *General.* Except where supplemental oxygen is provided in accordance with the requirements of § 40.203, 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, "altitude" shall mean the pressure altitude corresponding with the pressure in the cabin of the airplane, and "flight altitude" shall mean the altitude above sea level at which the airplane is operated.

(b) *Crew members.* (1) At 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 crew members during the portion of the flight in excess of 30 minutes within this range of altitudes.

(2) At 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 crew members during the entire flight time at such altitudes.

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

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

(3) For flights at 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.

* § 40.203 *Supplemental oxygen requirements for pressurized cabin airplanes.* When operating pressurized cabin airplanes, the air carrier shall so equip such airplanes as to permit compliance with the following requirements in the event of cabin pressurization failure:

(a) *For crew members.* When operating such airplanes at flight altitudes above 10,000 feet, the air carrier shall provide sufficient oxygen for all crew members 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 crew members on flight deck duty. The oxygen supply required by § 40.205 may be considered in determining the supplemental breathing supply required for flight crew members on flight deck duty in the event of cabin pressurization failure.

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

(1) When an airplane is not flown at a flight altitude of over 25,000 feet, a supply of oxygen sufficient to furnish oxygen for 30 minutes to 10 percent of the number of passengers carried shall be considered adequate, if at any point along the route to be flown the airplane can safely descend to a flight altitude of 14,000 feet or less within 4 minutes.

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

(i) For the duration of the flight in excess of 4 minutes at flight altitudes above 15,000 feet, a supply sufficient to comply with § 40.202 (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 § 40.202 (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 § 40.202 (c) (2) and (c) (3) for flight above 14,000 feet.

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

§ 40.204 *Equipment standards.* The oxygen apparatus, the minimum rates of oxygen flow, and the supply of oxygen necessary to comply with the requirements of § 40.202 shall meet the standards established in § 4b.651 of this subchapter, effective July 20, 1950: *Provided,* That where full compliance with such standards is found by the Administrator to be impractical, he may authorize such changes in these standards as he finds will provide an equivalent level of safety.

§ 40.205 *Protective breathing equipment for the flight crew*—(a) *Pressurized cabin airplanes.* Each required flight crew member 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 crew member on flight deck duty shall be provided for this purpose.

(b) *Nonpressurized cabin airplanes.* The requirement stated in paragraph (a) of this section shall apply to nonpressurized cabin airplanes, if the 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 the normal or emergency procedures approved by the Administrator.

§ 40.206 *Equipment for overwater operations.* (a) The following equipment shall be required for all extended overwater operations:

(1) Life vest or other adequate individual flotation device for each occupant of the airplane;

(2) Life rafts 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 life rafts, life vests, and signaling devices shall be easily accessible in the event of a ditching without appreciable time for preparatory procedures. After May 31, 1957, this equipment shall be installed in conspicuously marked approved locations.

(c) After May 31, 1957, a survival kit, appropriately equipped for the route to be flown, shall be attached to each required life raft.

§ 40.207 *Equipment for operations in icing conditions.* (a) For all operations in icing conditions each airplane shall be equipped with means for the prevention or removal of ice on windshields, wings, empennage, propellers, and other parts of the airplane where ice formation will adversely affect the safety of the airplane.

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

RADIO EQUIPMENT

§ 40.230 *Radio equipment.* Each airplane used in scheduled air transportation shall be equipped with radio equipment specified for the type of operation in which it is engaged. Where two independent radio systems are required by §§ 40.231 and 40.232, each system shall have an independent antenna

installation: *Provided,* That where rigidly supported nonwire antennas or other antenna installations of equivalent reliability are used, only one such antenna need be provided.

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

(1) Communicate with at least one appropriate ground station (as specified in § 40.34) from any point on the route and other airplanes operated by the air carrier;

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

(3) Receive meteorological information from any point en route by either of two independent systems.

(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 flown except that no marker beacon receiver or ILS receiver need be provided.

§ 40.232 *Radio equipment for operations under VFR over routes not navigated by pilotage or for operations under IFR or over-the-top.* (a) For operations conducted under VFR over routes on which navigation cannot be accomplished by pilotage or for operations conducted under IFR or over-the-top each airplane shall be equipped with such radio equipment as is necessary under normal operating conditions to fulfill the functions specified in § 40.231 (a) and to receive satisfactorily by either of two independent systems, radio navigational signals from all primary en route and approach navigational facilities intended to be used, except that only one marker beacon receiver which provides visual and aural signals and one ILS receiver need be provided. Equipment provided to receive signals en route may be used to receive signals on approach, if it is capable of receiving both signals.

(b) In the case of operation on routes using procedures based on automatic direction finding, only one automatic direction finding system need be installed: *Provided,* That ground facilities are so located and the airplane is so fueled that, in case of failure of the automatic direction finding equipment, the flight may proceed safely to a suitable airport which has ground radio navigational facilities whose signals may be received by the use of the remaining airplane radio systems.

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

MAINTENANCE AND INSPECTION REQUIREMENTS

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

§ 40.241 *Maintenance and inspection requirements.* (a) The air carrier, or the person with whom arrangements have been made for the performance of maintenance and inspection functions, shall establish an adequate inspection organization responsible for determining that workmanship, methods employed, and material used are in conformity with the requirements of the regulations of this subchapter, with accepted standards and good practices, and that any airframe, engine, propeller, or appliance released for flight is airworthy.

(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 license or airman certificate.

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

§ 40.243 *Maintenance and inspection personnel duty time limitations.* All maintenance and inspection personnel shall be relieved of all duty for a period of at least 24 consecutive hours during any 7 consecutive days or equivalent thereof within any one month.

AIRMAN AND CREW MEMBER REQUIREMENTS

§ 40.260 *Utilization of airman.* No air carrier shall utilize an individual as an airman unless he holds a valid appropriate airman certificate issued by the Administrator and is otherwise qualified for the particular operation in which he is to be utilized.

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

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

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

(d) On flights requiring a flight engineer, at least one other flight crew member 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.

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

§ 40.265 *Flight attendant.* At least one flight attendant shall be provided by the air carrier on all flights carrying passengers in airplanes of 10-passenger capacity or more.

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

§ 40.267 *Assignment of emergency evacuation functions for each crew member.* After May 31, 1956, each air carrier shall assign all necessary emergency functions for each crew member to perform in the event of circumstances requiring emergency evacuation. The air carrier shall show that functions so assigned are practicable of accomplishment. These functions shall be described in the air carrier manual.

TRAINING PROGRAM

§ 40.280 *Training requirements.* (a) Each air carrier shall establish a training program sufficient to insure that each crew member and dispatcher used by the air carrier is adequately trained to perform the duties to which he is to be assigned. The initial training phases shall be satisfactorily completed prior to serving in scheduled operations.

(b) Each air carrier shall be responsible for providing 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 are required for the airman being checked.

(c) The training program for each flight crew member shall consist of appropriate ground and flight training including proper flight crew coordination. Procedures for each flight crew function shall be standardized to the extent that each flight crew member will know the functions for which he is responsible and the relation of those functions to those of other flight crew members. The initial program shall include at least the appropriate requirements specified in §§ 40.281 through 40.286.

(d) The crew member emergency procedures training program shall include at least the requirements specified in § 40.286.

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

§ 40.281 *Initial pilot ground training.* Ground training for all pilots shall include instruction in at least the following:

(a) The appropriate provisions of the air carrier operations specifications and appropriate provisions of the regulations of this subchapter with particular emphasis on the operation and dispatching rules and airplane operating limitations;

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

(c) The duties and responsibilities of crew members;

(d) 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;

(e) The principles and methods of determining weight and balance limitations for take-off and landing;

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

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

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

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

§ 40.282 *Initial pilot flight training.* (a) Flight training for each pilot shall include at least take-offs and landings, during day and night, and normal and emergency flight maneuvers in each type of airplane to be flown by him in scheduled operations, and flight under simulated instrument flight conditions.

(b) Flight training for a pilot qualifying to serve as pilot in command shall include flight instruction and practice in at least the following maneuvers and procedures:

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

(i) At the authorized maximum take-off weight, take-off using maximum take-off 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_2), and climb-out shall be accomplished at a speed as close as possible to the take-off safety speed (V_2). Each pilot shall ascertain the proper values for speeds V_2 and V_2;

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

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

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

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

§ 40.284 *Initial flight engineer training.* (a) The training for flight engineers shall include at least the instruction specified in § 40.281 (a) through (e).

(b) Flight engineers shall be given sufficient training in flight to become proficient in those duties assigned them by the air carrier. Except for emergency procedures, this training may be accomplished during scheduled flight under the supervision of a qualified flight engineer.

§ 40.286 *Initial crew member emergency training.* (a) The training in emergency procedures shall be designed to give each crew member appropriate individual instruction in all emergency procedures, including assignments in the event of an emergency, and proper coordination between crew members. At least the following subjects as appropriate to the individual crew member 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) Synthetic trainers may be used for training of crew members in emergency procedures where the trainers sufficiently simulate flight operating emergency conditions for the equipment to be used.

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

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

(1) Contents of the air carrier operating certificate;

(2) Appropriate provisions of the air carrier operations specifications, manual, and regulations of this subchapter;

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

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

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

(6) Air carrier radio facilities;

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

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

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

(10) Prevailing weather phenomena;

(11) Sources of weather information available;

(12) Pertinent air traffic control procedures; and

(13) Emergency procedures.

§ 40.289 *Recurrent training.* (a) Each air carrier shall provide such training as is necessary to insure the continued competence of each crew member and dispatcher and to insure that each possesses adequate knowledge of and familiarity with all new equipment and procedures to be used by him.

(b) Each air carrier shall, at intervals established as part of the training program, but not to exceed 12 months, check the competence of each crew member and dispatcher with respect to procedures, techniques, and information essential to the satisfactory performance of his duties. Where the check of the pilot in command requires actual flight, such check shall be considered to have been met by the checks accomplished in accordance with § 40.302.

(c) The appropriate instructor, supervisor, or check airman shall certify as to the proficiency demonstrated, and such certification shall become a part of the individual's record. In the case of pilots other than pilots in command,

a pilot in command may make such certification.

FLIGHT CREW MEMBER AND DISPATCHER QUALIFICATION

§ 40.300 *Qualification requirements.* (a) No air carrier shall utilize any flight crew member or dispatcher, nor shall any such airman perform the duties authorized by his airman certificate, unless he satisfactorily meets the appropriate requirements of § 40.280 or § 40.289, and §§ 40.301 through 40.310. All pilots serving as pilot in command shall hold appropriate airline transport pilot certificates and ratings. All other pilots shall hold at least commercial pilot certificates and instrument ratings.

(b) Check airmen shall certify as to the proficiency of the pilot in command being examined, as required by §§ 40.302 and 40.303, and such certification shall become a part of the airman's records.

§ 40.301 *Pilot recent experience.* No air carrier shall schedule a pilot to serve as such in scheduled air transportation unless within the preceding 90 days he has made at least 3 take-offs and 3 landings in the airplane of the particular type on which he is to serve.

§ 40.302 *Pilot checks*—(a) *Line check.* Prior to serving as pilot in command, and at least once each 12 months thereafter, a pilot shall satisfactorily accomplish a line check in one of the types of airplanes normally to be flown by him. This check shall be given by a check pilot who is qualified for the route. It shall consist of at least a scheduled flight between terminals over a route to which the pilot is normally assigned during which the check pilot shall determine whether the individual being checked satisfactorily exercises the duties and responsibilities of pilot in command.

(b) *Proficiency check.* (1) An air carrier shall not utilize a pilot as pilot in command until he has satisfactorily demonstrated to a check pilot or a representative of the Administrator his ability to pilot and navigate airplanes to be flown by him. Thereafter, at least twice each 12 months at intervals of not less than 4 months or more than 8 months, a similar pilot proficiency check shall be given each such pilot. Where such pilots serve in more than one airplane type, the pilot proficiency check shall be given in the larger airplane type at least once each 12 months.

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

(i) The flight maneuvers specified in § 40.282 (b) (1), except that the simulated engine failure during take-off need not be accomplished at speed V_2.

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

(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.

§ 40.303 *Pilot route and airport qualification requirements.* (a) An air carrier shall not utilize a pilot as pilot in command until he has been qualified for the route on which he is to serve in accordance with paragraphs (b), (c), and (d) of this section and the appropriate instructor or check pilot has so certified.

(b) Each such pilot shall demonstrate adequate knowledge concerning the subjects listed below with respect to each route to be flown. 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 navigational and letdown procedures approved for use by the air carrier.

(1) Weather characteristics,
(2) Navigational facilities,
(3) Communication procedures,
(4) Type of en route terrain and obstruction hazards,
(5) Minimum safe flight levels,
(6) Position reporting points,
(7) Holding procedures,
(8) Pertinent traffic control procedures, and
(9) Congested areas, obstructions, physical layout, and all instrument approach procedures for each regular, provisional, and refueling airport approved for the route.

(c) Each pilot shall make an entry as a member of the flight crew at each regular, provisional, and refueling airport into which he is scheduled to fly. Unless impracticable, such entry shall include a landing and take-off under day VFR to permit the qualifying pilot to observe the airport and surrounding terrain, including any obstructions to landing and take-off. The qualifying pilot shall occupy a seat in the pilot compartment and shall be accompanied by a pilot who is qualified at the airport.

(d) On routes on which navigation must be accomplished by pilotage and on which flight is to be conducted at or below the level of the adjacent terrain which is within a horizontal distance of 25 miles on either side of the center line of the route to be flown, the pilot shall be familiarized with such route by not less than two one-way trips as pilot or additional member of the crew over the route under VFR to permit the qualifying pilot to observe terrain along the route.

§ 40.304 *Maintenance and reestablishment of pilot route and airport qualifications for particular trips.* (a) To maintain pilot route and airport qualifications, each pilot being utilized as pilot in command, within the preceding 12-month period, shall have made at least one trip as pilot or other member of the flight crew between terminals into which he is scheduled to fly and shall have complied with the provisions of § 40.303 (d), if applicable.

(b) In order to reestablish pilot route and airport qualifications after absence from a route for a period in excess of 12 months, a pilot shall comply with the appropriate provisions of § 40.303.

§ 40.305 *Competence check; other pilots.* Prior to serving as pilot, and at least twice each 12 months thereafter at intervals of not less than 4 months nor more than 8 months, each pilot not being utilized as pilot in command shall demonstrate that he is capable of flying by instruments. This demonstration may be made to a pilot serving as pilot in command or a check pilot of the air carrier during scheduled flight.

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

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

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

FLIGHT TIME LIMITATIONS

§ 40.320 *Flight time limitations.* (a) An air carrier shall not schedule any flight crew member for duty aloft in scheduled air transportation or in other commercial flying if his total flight time in all commercial flying will exceed the following flight time limitations:

(1) 1,000 hours in any year,
(2) 100 hours in any month,
(3) 30 hours in any seven consecutive days.

(b) An air carrier shall not schedule any flight crew member for duty aloft for more than 8 hours during any 24 consecutive hours, unless he is given an intervening rest period at or before the termination of 8 scheduled hours of duty aloft. Such rest period shall equal twice the number of hours of duty aloft since the last preceding rest period, and in no case shall the rest period be less than 8 hours.

(c) When a flight crew member has been on duty aloft in excess of 8 hours in any 24 consecutive hours he shall, upon completion of his assigned flight or series of flights, be given at least 16 hours for rest before being assigned any further duty with the air carrier.

(d) Time involved in transportation, not local in character, required of a flight crew member by an air carrier and provided by the air carrier for the purpose of transporting the flight crew member to an airport at which he is required to serve on a flight as a crew member, or from the airport at which he was relieved from duty as a crew member to return to his home station, shall not be considered as part of any required rest period.

(e) Each flight crew member engaged in scheduled air transportation shall be relieved from all duty with the air carrier for at least 24 consecutive hours during any seven consecutive days.

(f) No flight crew member shall be assigned any duty with an air carrier during any rest period prescribed by this part.

(g) A flight crew member shall not be considered to be scheduled for duty in excess of prescribed limitations, if the flights to which he is assigned are scheduled and normally terminate within such limitations, but due to exigencies beyond the air carrier's control, such as adverse weather conditions, are not at the time of departure expected to reach their destination within the scheduled time.

DUTY TIME LIMITATIONS; AIRCRAFT DISPATCHER

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

(b) The following rules will govern the hours of duty for an aircraft dispatcher, except when circumstances or emergency conditions beyond the control of the air carrier require otherwise:

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

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

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

FLIGHT OPERATIONS

§ 40.351 *Operational control.* The air carrier shall be responsible for operational control.

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

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

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

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

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

NOTE: Interpretation No. 1, 19 F. R. 1758, Mar. 31, 1954, provides as follows:

The Board interprets and construes § 40.351 (c) as conferring on the pilot in command, with respect to matters concerning the operation of the airplane, full control and authority without limitation over all other crew members and their duties during flight time, whether or not he holds a valid certificate authorizing him to perform the duties and functions of such other crew member.

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

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

* § 40.354 *Flight crew members at controls.* All required flight crew members shall remain at their respective stations when the airplane is taking off or landing, and while en route except when the absence of one such flight crew member is necessary in connection with his regular duties. All flight crew members shall keep their seat belts fastened when at their respective stations.

§ 40.355 *Manipulation of controls.* No person other than a qualified pilot of the air carrier 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) Authorized pilot safety representatives of the Administrator or the Board who are qualified on the airplane and are engaged in checking flight operations, or

(b) Pilot personnel of another air carrier properly qualified on the airplane and authorized by the operating carrier.

§ 40.356 *Admission to flight deck.* For purposes of this section the Administrator shall determine what constitutes the flight deck of an airplane.

(a) In addition to the crew members assigned to a particular airplane, CAA Aviation Safety agents and authorized representatives of the Board while in the performance of official duties shall be admitted to the flight deck of an airplane.

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

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

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

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

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

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

(1) CAA Aviation Safety agents or other authorized representatives of the Civil Aeronautics Administration or the Civil Aeronautics Board engaged in checking flight operations;

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

(3) Certificated airmen of the air carrier; and

(4) Certificated airmen of another air carrier who have been authorized by the air carrier concerned to make specific trips over the route.

§ 40.357 *Use of cockpit check procedure.* The cockpit check procedure shall be used by the flight crew for each procedure as set forth in § 40.176.

§ 40.358 *Personal flying equipment.* The pilot in command shall insure that the following equipment is aboard the airplane for each flight:

(a) Appropriate aeronautical charts containing adequate information concerning navigational aids and instrument approach procedures, and

(b) A flashlight in good working order in the possession of each crew member.

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

§ 40.360 *Emergency decisions; pilot in command and aircraft dispatcher.* (a) In emergency situations which require immediate decision and action, the pilot in command may follow any course of action which he considers necessary under the circumstances. In such 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 regulations of this subchapter.

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

(c) When emergency authority is exercised by the pilot in command or by the dispatcher, the appropriate dispatch center shall be kept fully informed regarding the progress of the flight, and within 10 days after the completion of the particular flight a written report of any deviation shall be submitted by the individual declaring the emergency to the Administrator through the air carrier operations manager.

§ 40.361 *Reporting potentially hazardous meteorological conditions and irregularities of ground and navigational facilities.* When any meteorological condition or irregularity of ground or navigational facilities is encountered in flight, the knowledge of which the pilot in command considers essential to the safety of other flights, he shall notify an appropriate ground radio station as soon as practicable. Such information shall thereupon be relayed by that station to the appropriate governmental agency.

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

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

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

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

(2) The availability of the inoperative engine for use;

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

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

(5) The air traffic congestion;

(6) The type of terrain; and

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

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

(d) In cases where the pilot in command selects an airport other than the nearest suitable airport in point of time, he shall, upon completion of the trip, submit a written report, in duplicate, to his operations manager setting forth his reasons for determining that the selection of an airport other than the nearest was as safe a course of action as landing at the nearest suitable airport. The operations manager shall, within 7 days after completion of the trip, furnish a copy of this report with his own comments thereon to the Administrator.

§ 40.364 *Instrument approach procedures.* When an instrument approach is necessary, the instrument approach procedures and weather minimums authorized in the operations specifications shall be adhered to.

§ 40.365 *Requirements for air carrier equipment interchange.* (a) Prior to conducting any operations pursuant to an interchange agreement authorized by the Civil Aeronautics Board, the air carrier shall show that:

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

(2) All operations personnel involved are familiar with the airplanes and equipment of the air carrier with whom interchange is to be effected, and with the communications and dispatching procedures to be used;

(3) All maintenance personnel involved are familiar with the airplanes and equipment, and the maintenance procedures of the air carrier with whom interchange is to be effected;

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

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

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

§ 40.370 *Briefing of passengers.* After May 31, 1956, each air carrier engaged in extended overwater operations shall assure that all passengers are briefed orally concerning the location and method of operation of life vests and and emergency exits and the location of life rafts. The procedure to be followed in presenting this briefing shall be described in the air carrier manual. Such a briefing shall include a demonstration of the method of donning and inflating a life vest. Where the airplane proceeds directly over water after take-off, the briefing on location of the life vests and emergency exists shall be accomplished prior to take-off, and the remainder of the briefing shall be accomplished as soon thereafter as practicable. Where the airplane does not proceed directly over water after take-off, no part of the briefing need be accomplished prior to take-off but the entire briefing shall be accomplished prior to reaching the overwater portion of the flight.

DISPATCHING RULES

§ 40.381 *Necessity for dispatching authority.* No flight shall be started without specific authority from an aircraft dispatcher, except when an airplane has landed at an intermediate airport specified in the original dispatch release and has remained there for one hour or less.

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

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

§ 40.384 *Airplane equipment required for dispatch.* All airplanes dispatched

shall be airworthy and shall be equipped in accordance with the provisions of § 40.170.

§ 40.385 *Communications and navigational facilities required for dispatch.* No airplane shall be dispatched over any route or route segment unless the communications and navigational facilities required by §§ 40.34 and 40.36 are in satisfactory operating condition.

§ 40.386 *Dispatching under VFR.* Airplanes shall be dispatched for operation under VFR only if the appropriate weather reports and forecasts, or a combination thereof, indicate that the ceilings and visibilities along the route to be flown are, and will remain, at or above the minimums required for flight under VFR until the flight arrives at the airport or airports of intended landing specified in the dispatch release.

§ 40.387 *Dispatching under IFR or over-the-top.* Airplanes shall be dispatched for operation under IFR or over-the-top only if the appropriate weather reports and forecasts, or a combination thereof, pertaining to the airport or airports to which dispatched indicate that the ceilings and visibilities will be at or above the minimums approved by the Administrator at the estimated time of arrival thereat.

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

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

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

(b) The alternate airport weather requirements shall be those specified in § 40.390.

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

§ 40.389 *Alternate airport for destination; IFR or over-the-top.* (a) For all IFR or over-the-top operations there shall be at least one alternate airport designated for each airport of destination and, when the weather conditions forecast for the destination and first alternate are marginal, at least one additional alternate airport: *Provided,* That no alternate need be designated when, for the period two hours before to two hours after the estimated time of arrival, the ceiling at the airport to which the flight is dispatched is forecast to be at least 1,000 feet above the minimum initial approach altitude applicable to such airport and the visibility at such airport is forecast to be at least three miles.

(b) The alternate airport weather requirements shall be those specified in § 40.390.

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

§ 40.390 *Alternate airport weather minimums.* An airport shall not be specified in the dispatch release as an alternate airport unless the weather conditions existing there at the time of dispatch are equal to or above the ceiling and visibility minimums approved for such airport when using it as an alternate, and the appropriate weather reports and forecasts, or a combination thereof, indicate that the weather conditions will be at or above such minimums until the flight shall arrive thereat. The weather minimums at such alternate airport shall not be less than one of the following and in no event less than the corresponding minimums specified for the airport when used as a regular airport: *Provided,* That the Administrator may approve higher or lower minimums at particular airports where the safe conduct of flight requires or permits, considering the character of the terrain being traversed, the meteorological service and navigational facilities available, and other conditions affecting flight.

(a) An airport served by an approved radio navigational facility and either an instrument landing system or a ground control approach system which the carrier has been authorized to use: Ceiling 800 feet and visibility of one mile; or ceiling 700 feet and visibility of 1½ miles; or ceiling 600 feet and visibility of two miles;

(b) An airport served by an approved radio navigational facility: Ceiling 1,000 feet and visibility of one mile; or ceiling 900 feet and visibility of 1½ miles; or ceiling 800 feet and visibility of two miles;

(c) An airport not served by an approved radio navigational facility: If overcast, ceiling 1,000 feet above the minimum en route instrument altitude applicable to the route to such alternate airport and visibility of two miles; if broken clouds, ceiling 1,000 feet above the elevation of the airport and visibility of two miles.

§ 40.391 *Continuance of flight; flight hazards.* (a) No airplane shall be continued in flight toward any airport to which it has been dispatched when, in the opinion of the pilot in command or the aircraft dispatcher, the flight cannot be completed with safety, unless in the opinion of the pilot in command there is no safer procedure. In the latter event, continuation shall constitute an emergency situation as set forth in § 40.360.

(b) If any item of equipment required pursuant to the regulations of this subchapter for the particular operation being conducted becomes unserviceable en route, the pilot in command shall comply with the procedures specified in the manual for such occurrence: *Provided,* That the Administrator may authorize the incorporation in the air carrier manual of procedures for the continued operation of an airplane beyond a scheduled terminal where he finds that, in the particular circumstances of the case, literal compliance with this requirement is not necessary in the interest of safety.

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

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

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

(b) An airport specified as a destination or alternate for the purpose of original dispatch may be changed en route to another airport which is authorized for the type of airplane to be operated, provided that the appropriate requirements of §§ 40.381 through 40.409 and § 40.70 or § 40.90 are met at the time of redispatch.

(c) No flight shall be continued to any airport to which it has been dispatched unless the weather conditions at an alternate airport specified in the dispatch release remain at or above the minimums specified for such airport when used as an alternate: *Provided,* That the dispatch release may be amended en route to include any approved alternate airport lying within the fuel range of the airplane as specified in §§ 40.396 and 40.397.

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

§ 40.394 *Dispatch to and from provisional airport.* (a) No aircraft dispatcher shall dispatch an airplane to a provisional airport unless such airport complies with all of the requirements of this part pertinent to regular airports.

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

§ 40.395 *Take-offs from alternate airports or from airports not listed in the operations specifications.* No airplane shall take off from an alternate airport or from an airport which is not listed in the air carrier operations specifications unless:

(a) Such airport and related facilities are adequate for the operation of the airplane;

(b) In taking off it is possible to comply with the applicable airplane operating limitations;

(c) The weather conditions at that airport are equal to or better than those prescribed for such airport; and

(d) The airplane is dispatched in accordance with all dispatching rules applicable to operation from an approved airport.

§ 40.396 *Fuel supply for all operations.* No airplane shall be dispatched unless it carries sufficient fuel:

(a) To fly to the airport to which dispatched, and thereafter;

(b) To fly to and land at the most distant alternate for the airport to which dispatched where such alternate is required, and thereafter;

(c) To fly for a period of at least 45 minutes at normal cruising consumption.

§ 40.397 *Factors involved in computing fuel required.* In computing the fuel required, consideration shall be given to the wind and other weather conditions forecast, traffic delays anticipated, and any other conditions which might delay the landing of the airplane. Required fuel shall be additional to unusable fuel.

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

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

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

* § 40.406 *Take-off and landing weather minimums; IFR.* (a) Except as provided in paragraphs (c) and (d) of this section, irrespective of any clearance which may be obtained from air traffic control, no airplane shall take off or land under IFR when the reported ceiling or ground visibility is less than that approved for the airport when used as a regular airport.

(b) Except as provided in paragraphs (c) and (d) of this section, no instrument approach procedure shall be executed when the latest weather report furnished by a source authorized in accordance with the provisions of § 40.35 indicates the ceiling or visibility is less than the landing minimum approved for the airport when used as a regular airport.

(c) An instrument approach procedure may be executed when the weather report indicates that the ceiling or visibility is less than approved minimum for landing, if the airport is served by ILS and PAR in operative condition and both are used by the pilot, and thereafter a landing may be made, if weather conditions equal to or better than the prescribed minimums are found to exist by the pilot in command upon reaching the authorized landing minimum altitude.

(d) If an instrument approach procedure is initiated when the current U. S. Weather Bureau report indicates that the prescribed 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 GCA final approach and has been turned over to the final approach controller, such ILS, Range, or GCA approach may be continued and a landing may be made in the event weather conditions equal to or better than the prescribed minimums for the airport are found to exist by the pilot in command of the flight upon reaching the authorized landing minimum altitude.

§ 40.408 *Flight altitude rules.* Except when necessary for take-off and landing, the flight altitude rules prescribed in paragraphs (a) and (b) of this section, in addition to the applicable provisions of § 60.17 of this subchapter, shall govern air carrier operations: *Provided,* That other altitudes may be established by the Administrator 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 permits or requires such other altitudes.

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

(b) *Night VFR or IFR operations including over-the-top.* No airplane shall be flown at an altitude less than 1,000 feet above the highest obstacle located within a horizontal distance of five 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 five 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 a lighted civil airway at a minimum altitude of 1,000 feet above such obstacle: *And provided further,* That in the case of high-altitude operations, the minimum altitude shall be not less than 2,000 feet above the elevation of the highest ground within 25 miles of the intended track: *And provided further,* That adherence to a minimum 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 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 five 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.

§ 40.409 *Altitude maintenance on initial approach.* (a) When making an initial approach to a radio navigational facility under IFR (excluding over-the-top conducted in accordance with the provisions of § 40.408 (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 § 40.408 (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 or the minimum altitude specified by the Administrator for that portion of the instrument approach procedure being flo whichever is the lower.

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

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

REQUIRED RECORDS AND REPORTS

* § 40.500 *Records.* Each scheduled air carrier shall maintain records and submit reports in accordance with the requirements of §§ 40.501 through 40.511. All records shall be retained for the period specified in Part 249 of Subchapter B of this chapter (Economic Regulations), unless otherwise specified §§ 40.501 through 40.511.

§ 40.501 *Crew member and dispatcher records.* Each air carrier shall maintain current records of every crew member and aircraft dispatcher. These records shall contain such information concerning the qualifications of each such crew member and dispatcher as is necessary to show compliance with the appropriate requirements of the regulations of this subchapter, e. g., proficiency and route checks, airplane qualifications, training, physical examinations, and flight time records. The disposition of any flight crew member or aircraft dispatcher released from the employ of the air carrier, or who becomes physically or pro-

fessionally disqualified, shall be indicated in these records which shall be retained by the air carrier for at least three months.

§ 40.502 *List of airplanes.* Each air carrier shall maintain a current list of all airplanes being operated by it in scheduled air transportation: *Provided,* That airplanes of another air carrier being operated in accordance with an interchange agreement may be incorporated by reference.

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

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

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

(3) Minimum fuel supply; and

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

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

§ 40.504 *Load manifest.* (a) The load manifest shall contain at least the following information with respect to the loading of an airplane at the time of take-off:

(1) The weight of:

(i) Airplane,

(ii) Fuel and oil,

(iii) Cargo, including mail and baggage, and

(iv) Passengers;

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

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

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

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

✱ § 40.505 *Disposition of load manifest, dispatch release form, and flight plans.* Copies of the completed load manifest, or information therefrom except with respect to cargo and passenger distribution, the dispatch release form, and the flight plan shall be in the possession of the pilot in command and shall be carried in the airplane to its destination. Copies also shall be kept for at least 60 days.

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

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

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

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

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

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

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

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

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

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

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

§ 40.509 *Mechanical interruption summary report.* Each air carrier shall submit regularly and promptly to the Administrator a summary report containing information on the following occurrences:

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

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

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

§ 40.510 *Alteration and repair reports.* Reports of major alterations or repairs of airframes, engines, propellers, and appliances shall be made available to the Administrator promptly upon completion of such alterations or repairs.

✱ § 40.511 *Maintenance release.* When an airplane is released by the maintenance organization to flight operations, a maintenance release or appropriate entry into the maintenance log certifying that the airplane is in an airworthy condition shall be prepared and signed by a maintenance inspector or a person authorized by the inspection organization prior to release of such airplane. If a maintenance release form is prepared, a copy shall be given to the pilot in command. An appropriate record shall be kept for at least 60 days. ✱

AMENDMENTS TO CAR PART 40

SCHEDULED INTERSTATE AIR CARRIER CERTIFICATION AND OPERATION RULES

40.30 The proviso is to read as follows: *"Provided,* That high-altitude VFR operations may be conducted over any route."

40.31 The proviso is to read as follows: *"Provided,* That for high-altitude VFR operations courses need not be approved and the width of navigable airspace on each side thereof need not be designated by the Administrator."

40.32 The proviso is to read as follows: *"Provided,* That IFR routes outside of control areas shall not be approved for high-altitude operations."

40.35 *Weather reporting facilities.* The second sentence, beginning "Weather reports," is to read as follows: Forecasts used to control flight movements shall be prepared from weather reports furnished in accordance with paragraphs (a) and (b) of this section as appropriate.

(a) For operations within the continental limits of the United States, weather reports used to control flight movements shall be those prepared by the U.S. Weather Bureau, or by a source approved by the Weather Bureau.

(b) For operations authorized in accordance with 40.1 to be conducted outside the continental limits of the United States, weather reports used to control flight movements may be those prepared by any source approved by the Administrator."

40.60 *General.* Add a new sentence at end of paragraph to read as follows: 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.

40.75 *Enroute limitations; two engines inoperative.* Section (b) (2) is to read as follows: (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 Vs_0^2 greater than indicated by the performance information approved by the Administrator.

40.173 *Emergency equipment for all operations.* Section (f) (1) and (2): Insert in the first sentence of paragraphs (1) and (2) the word "passenger" between the words "all" and "emergency.

40.200 *Instruments and equipment for operations at night.* 40.200 (a) to read as follows: "(a) Position lights." 40.200 (b) delete the following: "After May 31, 1956." 40.200 (d) add after the word "flares" the words "for extended overwater operations."

40.203 The title of this paragraph is to read as follows: *"Supplemental oxygen requirements for pressurized cabin airplanes; reciprocating-engine powered airplanes."*

40.203-T This new section is to read as follows: *Supplemental oxygen for emergency descent and for first aid; turbine-powered airplanes with pressurized cabins.*

(a) *General.* Prior to July 31, 1959, turbine-powered airplanes with pressurized cabins shall comply with the provisions of 40.203 or, alternately, with the provisions of this section except that effective July 31, 1959, all such turbine-powered airplanes shall comply with the provisions of this section. When operating pressurized cabin airplanes, the aircarrier shall furnish oxygen and dispensing equipment necessary to permit compliance with the requirements set forth in this section in the event of cabin pressurization failure.

(b) *Crew members.* When operating at flight altitudes above 10,000 feet, oxygen shall be provided to permit compliance with 40.202-T except that not less than a two-hour supply shall be provided for the flight crew members on flight deck duty. The oxygen required by 40.205 may be included in determining the supply required for flight crew members on flight deck duty in the event of cabin pressurization failure.

(c) *Use of oxygen masks by flight crew members.* When operating at flight altitudes above 25,000 feet, one pilot at the controls of the airplane shall wear and use an oxygen mask at all times and all other flight crew members on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be worn in a manner that will permit immediate placing of the masks on their faces for use, properly secured and sealed: Provided, that the one pilot need not wear a mask at or below 30,000 feet if all flight crew members are equipped with a quick-donning type of oxygen mask which is demonstrated to be satisfactory to a representative of the Administrator.

(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.

(f) *Passenger briefing.* Before flight is conducted above 25,000 feet, a crew member 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 depressurization.

40.208 *Flight recorders.* This is a new paragraph, to read as follows: A flight recorder which records time, airspeed, altitude, vertical acceleration, and heading shall be installed on all airplanes of more than 12,500 pounds maximum gross certificated takeoff weight which are certificated for operations above 25,000 feet altitude, and shall be operating continuously during flight. The recorded information shall be retained by the air carrier for a period of at least 60 days. For a particular

flight or series of flights, the information shall be retained for a longer period if requested by an authorized representative of the Administrator or the Civil Aeronautics Board.

40.354 *Flight crew members at controls.* This paragraph is to read: All required flight crew members when on flight deck duty shall remain at their respective stations while the airplane is taking off or landing, and while enroute except when the absence of one such flight crew member is necessary for the performance of his duties in connection with the operation of the airplane. All flight crew members shall keep their seat belts fastened when at their respective stations.

40.406 *Takeoff and landing weather minimums; IFR.* This section is to read as follows:

(a) Except as provided in paragraphs (c) and (d) of this section, irrespective of any clearance which may be obtained from air traffic control, no airplane shall take off or land under IFR when the ceiling or ground visibility reported by the U.S. Weather Bureau or by a source approved by the Weather Bureau is less than the minimum approved for the airport when used as a regular airport.

(b) Except as provided in paragraphs (c) and (d) of this section, no instrument approach procedure shall be executed when the latest weather report prepared by the U.S. Weather Bureau or by a source approved by the Weather Bureau indicates the ceiling or visibility is less than the landing minimum approved for the airport when used as a regular airport.

(c) An instrument approach procedure may be executed when the weather report prepared by the U.S. Weather Bureau or by a source approved by the Weather Bureau indicates that the ceiling or visibility is less than the approved minimum for landing, if the airport is served by ILS and PAR in operative condition and both are used by the pilot, and thereafter a landing may be made, if weather conditions equal to or better than the prescribed minimums are found to exist by the pilot in command upon reaching the authorized landing minimum altitude.

(d) If an instrument approach procedure is initiated when the current report prepared by the U.S. Weather Bureau or by a source approved by the Weather Bureau indicates that the prescribed 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 a GCA final approach and has been turned over to the final approach controller, such ILS, Range, or GCA approach may be continued and a landing may be made in the event weather conditions equal to or better than the prescribed minimums for the airport are found to exist by the pilot in command of the flight upon reaching the authorized landing minimum altitude.

40.500 *Records.* This paragraph is deleted.

40.505 *Disposition of load manifest, dispatch release form, and flight plans.* At the end of the paragraph, delete the words "60 days" and substitute "3 months."

40.511 *Maintenance release.* At the end of the paragraph delete the words "60 days" and substitute "2 months."

40.512 *Communication records.* This is a new paragraph to read as follows: Each air carrier shall maintain, and retain for a period of 30 days, records of radio contacts by or with pilots enroute.

BASIC VFR MINIMUMS

	VISIBILITY	DISTANCE FROM CLOUDS	
CONTROL ZONE	3 miles[1]	500 feet under[1] 1,000 feet over[1] 2,000 feet horizontally[1] and 1,000-foot ceiling	
CONTROL AREA	3 miles	500 feet under 1,000 feet over 2,000 feet horizontally	
CONTINENTAL CONTROL AREA	5 miles	1,000 feet under 1,000 feet over 1 mile horizontally	
		700 feet or BELOW	ABOVE 700 feet
OUTSIDE CONTROLLED AIRSPACE	1 mile[2]	clear of clouds	500 feet under 1,000 feet over 2,000 feet horizontally

[1] If traffic conditions permit, air traffic control will issue an air traffic clearance for flight within a control zone when the weather conditions are less than the above. However, no person shall operate an aircraft VFR, irrespective of any clearance, unless the visibility is one mile and the flight can remain clear of clouds.

[2] Helicopters are excepted from the one mile requirement when operated at or below 700 feet and at reduced airspeed. (see 60.30.)

CIVIL AIR REGULATIONS

PART 60
AIR TRAFFIC RULES

CIVIL AERONAUTICS BOARD

WASHINGTON, D. C.

GENERAL

§ 60.1 *Scope.* The air traffic rules in this part shall apply to aircraft operated anywhere in the United States, including the several States, the District of Columbia, and the several Territories and possessions of the United States, including the territorial waters and the overlying airspace thereof, except:

(a) Military aircraft of the United States armed forces when appropriate military authority determines that noncompliance with this part is required and prior notice thereof is given to the Administrator, and

(b) Aircraft engaged in special flight operations, requiring deviation from this part, which are conducted in accordance with the terms and conditions of a certificate of waiver issued by the Administrator.

NOTE: Specific operations which cannot be conducted within the provisions of the regulations in this part, such as air races, air meets, acrobatic flights, or certain pest control or seeding operations require, prior to commencement of the operation, a certificate of waiver which may be obtained from the nearest office of CAA.

§ 60.1a *Operation over the high seas.* Aircraft of United States registry operated in air commerce shall while over the high seas comply with the provisions of Annex 2 (Rules of the Air) to the Convention on International Civil Aviation.

NOTE: An airman who complies fully with Part 60 while over the high seas will also be in compliance with Annex 2. Under Article 12 of the Convention on International Civil Aviation, the member states undertake to make their regulations conform to the greatest possible extent to the ICAO Annexes. It may therefore be expected that the provisions of Annex 2 will be generally applicable to flight over the territory of member states of the International Civil Aviation Organization.

§ 60.2 *Authority of the pilot.* The pilot in command of the aircraft shall be directly responsible for its operation and shall have final authority as to operation of the aircraft. In emergency situations which require immediate decision and action the pilot may deviate from the rules prescribed in this part to the extent required by consideration of safety. When such emergency authority is exercised, the pilot, upon request of the Administrator, shall file a written report of such deviation. In an emergency situation which results in no deviation from the rules prescribed in this part but which requires air traffic control to give priority to an aircraft, the pilot of such aircraft shall make a report within 48 hours of such emergency situation to the nearest regional office of the Administrator.

GENERAL FLIGHT RULES (GFR)

§ 60.10 *Application.* Aircraft shall be operated at all times in compliance with the following general flight rules and also in compliance with either the visual flight rules or the instrument flight rules, whichever are applicable.

§ 60.11 *Preflight action.* Before beginning a flight, the pilot in command of the aircraft shall familiarize himself with all available information appropriate to the intended operation. Preflight action for flights away from the vicinity of an airport, and for all IFR flights, shall include a careful study of available current weather reports and forecasts, taking into consideration fuel requirements, an alternate course of action if the flight cannot be completed as planned, and also any known traffic delays of which he has been advised by air traffic control.

§ 60.12 *Careless or reckless operation.* No person shall operate an aircraft in a careless or reckless manner so as to endanger the life or property of others.

NOTE: Examples of aircraft operations which may endanger the lives or property of others are:

(a) Any person who "buzzes", dives on, or flies in close proximity to a farm, home, any structure, vehicle, vessel, or group of persons on the ground. In rural districts the flight of aircraft at low altitude often causes injury to livestock. A pilot who engages in careless or reckless flying and who does not own the aircraft which he is flying unduly endangers the aircraft, the property of another.

(b) The operation of aircraft at an insufficient altitude endangers persons or property on the surface or passengers within the aircraft. Such a flight may also constitute a violation of § 60.17.

(c) Lack of vigilance by the pilot to observe and avoid other air traffic. This includes failure of the pilot to clear his position prior to starting any maneuver, either on the ground or in flight; and special flight activities which require such preoccupation by the pilot with cockpit duties as would prevent adequate vigilance outside the cockpit for the purpose of collision avoidance without compensation for such reduced degree of vigilance by the use of a competent observer in the aircraft, a chase aircraft, or other arrangements.

(d) Passing other aircraft too closely.

(e) An operation conducted above a cloud layer in accordance with VFR minimums which results in the pilot becoming involved in instrument flight, unless the pilot possesses a valid instrument rating, the aircraft is properly equipped for instrument flight, and all IFR requirements are observed.

§ 60.13 *Avoidance of prohibited and restricted areas.*—(a) *Prohibited area.* No person shall operate an aircraft within a prohibited area unless prior permission has been obtained from appropriate authority.

(b) *Restricted area.* No person shall operate an aircraft within a restricted area contrary to the restrictions imposed unless prior permission has been obtained from appropriate authority.

NOTE: Prohibited and restricted areas are established in order to conduct certain essential activities either on the ground or within the airspace area. Avoidance of prohibited areas and operation within restricted areas strictly in accordance with the published restrictions are imperative to the safety of flight or the protection of the activity on the ground. Any person desiring to secure permission to fly in such areas contrary to the prohibition or the restrictions imposed, should contact the agency controlling that area. Prohibited and restricted areas, indicating the prohibitions or restrictions to flight and the name of the using agency, are shown on aeronautical charts or in publications of aids to air navigation.

§ 60.13a *Authority for designation of restricted areas by the Administrator.* The Administrator is authorized to designate restricted areas when he finds that a hazard to aircraft in flight exists. (Areas previously designated as danger areas will hereafter be designated as restricted areas.)

§ 60.14 *Right-of-way.* An aircraft which is obliged by the following rules to keep out of the way of another shall avoid passing over or under the other, or crossing ahead of it, unless passing well clear:

NOTE: Right-of-way rules do not apply when, for reasons beyond the pilot's control, aircraft cannot be seen due to restrictions of visibility. The aircraft which has the right-of-way will normally maintain its course and speed, but nothing in this part relieves the pilot from the responsibility for taking such action as will best aid to avert collision.

(a) *Distress.* An aircraft in distress has the right-of-way over all other air traffic:

(b) *Converging.* Aircraft converging shall give way to other aircraft of a different category in the following order airplanes and rotorcraft shall give way to airships, gliders, and balloons; airships shall give way to gliders and balloons; gliders shall give way to balloons. When two or more aircraft of the same category are converging at approximately the same altitude, each aircraft shall give way to the other which is on its right. In any event, mechanically driven aircraft shall give way to aircraft which are seen to be towing other aircraft;

NOTE: In effect, an aircraft will give way to another of a different class which is less maneuverable and is unable to take as effec-

tive action to avoid collision. For this reason aircraft towing others are given the right-of-way.

(c) *Approaching head-on.* When two aircraft are approaching head-on, or approximately so, each shall alter its course to the right;

(d) *Overtaking.* An aircraft that is being overtaken has the right-of-way, and the overtaking aircraft, whether climbing, descending, or in horizontal flight, shall keep out of the way of the other aircraft by altering its course to the right, and no subsequent change in the relative positions of the two aircraft shall absolve the overtaking aircraft from this obligation until it is entirely past and clear;

NOTE: Passing an overtaken aircraft on the right is required because the pilot in side-by-side, dual-control aircraft is seated on the left and has a better view on that side. Further, in narrow traffic lanes, passing on the left of an overtaken aircraft would place the overtaking aircraft in the path of the oncoming traffic.

(e) *Landing.* Aircraft, while on final approach to land, or while landing, have right-of-way over other aircraft in flight or operating on the surface. When two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right-of-way, but it shall not take advantage of this rule to cut in in front of another which is on final approach to land, or to overtake that aircraft.

NOTE: Pilots must recognize that once committed to a landing in certain aircraft the pilot has little chance to avoid other aircraft which may interfere with that landing and, therefore, careful observance of this rule is important to the safety of all concerned.

§ 60.15 *Proximity of aircraft.* No person shall operate an aircraft in such proximity to other aircraft as to create a collision hazard. No person shall operate an aircraft in formation flight when passengers are carried for hire. No aircraft shall be operated in formation flight except by prearrangement between the pilots in command of such aircraft.

§ 60.16 *Acrobatic flight.* No person shall engage in acrobatic flight:

(a) Over congested areas of cities, towns, settlements, or over an open-air assembly of persons, or

(b) Within any civil airway or control zone, or

(c) When the flight visibility is less than 3 miles, or

(d) Below an altitude of 1,500 feet above the surface.

NOTE: Acrobatic maneuvers performed over a congested area or an open assembly of persons, or in areas where considerable air traffic exists, creates an undue hazard to persons or property. Flight visibility of at least 3 miles is believed to be a prerequisite to acrobatic flight in order that the pilot, after scanning the entire vicinity, may be reasonably assured that no other aircraft is within dangerous proximity prior to performing such maneuvers.

§ 60.17 *Minimum safe altitudes.* Except when necessary for take-off or landing, no person shall operate an aircraft below the following altitudes:

(a) *Anywhere.* An altitude which will permit, in the event of the failure of a power unit, an emergency landing without undue hazard to persons or property on the surface;

(b) *Over congested areas.* Over the congested areas of cities, towns or settlements, or over an open-air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet from the aircraft. Helicopters may be flown at less than the minimum prescribed herein if such operations are conducted without hazard to persons or property on the surface and in accordance with paragraph (a) of this section; however, the Administrator, in the interest of safety, may prescribe specific routes and altitudes for such operations, in which event helicopters shall conform thereto;

NOTE: The rule recognizes the special flight characteristics of the helicopter which can accomplish an emergency landing within a relatively small space. However, if a helicopter is flown over the congested area of a city, town or settlement, at less than 1,000 feet above the highest obstacle, the pilot is required to fly with due regard to places in which an emergency landing can be made with safety and, further, to maintain an altitude along the flight path thus selected from which such an emergency landing can be effected at any time.

(c) *Over other than congested areas.* An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In such event, the aircraft shall not be operated closer than 500 feet to any person, vessel, vehicle, or structure. Helicopters may be flown at less than the minimums prescribed herein if such operations are conducted without hazard to persons or property on the surface and in accordance with paragraph (a) of this section;

NOTE: When flight is necessary at an altitude of less than 500 feet above the surface, the pilot must avoid creating any hazard to persons or property on the surface which may result from such flight. In no event should the pilot expose his passengers to unnecessary hazard while engaging in flight at low altitude. The maneuverability of the helicopter permits safe flight below the minimums required in § 60.17, provided good judgment and caution are exercised by the pilot.

(d) *IFR operations.* The minimum IFR altitude established by the Administrator for that portion of the route over which the operation is conducted. Such altitude shall be that which the safe conduct of flight permits or requires considering the character of the terrain being traversed, the meteorological services and navigational facilities available, and other flight conditions. Where the Administrator has not established such a minimum, operations shall be conducted at not less than 1,000 feet above the highest obstacle within a horizontal distance of 5 miles from the center of the course intended to be flown.

NOTE: When minimum altitudes are established by the Administrator for particular routes, such altitudes will be published in Parts 609 and 610 of this title, and also may be found in the Approach and Landing Charts and Radio Facility Charts of the Coast and Geodetic Survey, and in the Airman's Guide.

NOTE: Civil Air Regulations, Interpretation 1, 19 F. R. 4602, July 27, 1954, provides in part as follows:

"The Board construes the words Except when necessary for take-off or landing, no person shall operate an aircraft below the following altitudes, where such words appear in § 60.17 of the Civil Air Regulations, as establishing a minimum altitude rule of specific applicability to aircraft taking off and landing. It is a rule based on the standard of necessity, and applies during every instant that the airplane climbs after take-off and throughout its approach to land. Since this provision does prescribe a series of minimum altitudes within the meaning of the act, it follows, through the application of section 3, that an aircraft pursuing a normal and necessary flight path in climb after take-off or in approaching to land is operating in the navigable airspace."

§ 60.18 *Operation on and in the vicinity of an airport.* Aircraft shall be operated on and in the vicinity of an airport in accordance with the following rules:

(a) When approaching for landing, all turns shall be made to the left unless the airport displays standard visual markings approved by the Administrator and which indicate that all turns are to be made to the right, or unless otherwise authorized by air traffic control;

NOTE: Where right-hand turns and clockwise flow of traffic are desirable in the interest of safety, airport markings visible from the air will inform the transient pilot of the necessity for making turns to the right.

(b) If air traffic control is in operation at the airport, contact shall be maintained with such control, either visually or by radio, to receive any air traffic control instructions which may be issued;

(c) Aircraft operating from an airport shall conform to the traffic patterns prescribed for that airport;

(d) The Administrator may, when necessary in the interest of safety, prescribe traffic patterns for an airport which shall supersede any other traffic patterns previously prescribed;

(e) When light signals are used for the control of air traffic, they shall be of the color and have the meaning prescribed by the Administrator.

(f) High density air traffic zone. In any area not above 3,000 feet above the surface in which the Administrator finds that the volume of traffic is such as to adversely affect safety, he shall designate such airspace as a high density air traffic zone in which the following rules shall apply:

(1) Speed. No person shall operate an aircraft within a high density air traffic zone at a speed in excess of 180 mph or 160 knots indicated airspeed unless operational limitations for a particular aircraft require greater airspeeds, in which case the aircraft shall not be flown in excess of the minimum speed consistent with the safe operational limitations of the aircraft.

(2) Communication requirements. No person shall take off or land an aircraft at or enter the traffic pattern of a desginated high density airport unless radio communication with the appropriate air traffic control facility has been established: Provided, That an aircraft not equipped with functioning two-way radio may take off or land at or enter the traffic pattern of such designated airport if prior authorization from the appropriate airport traffic control tower has been given.

§ 60.19 *Air traffic control instructions.* No person shall operate an aircraft contrary to air traffic control instructions in areas where air traffic control is exercised.

§ 60.20 *Notification of arrival.* If a flight plan has been filed, the pilot in command of the aircraft, upon landing or completion of the flight, shall file an arrival or completion notice with the nearest Civil Aeronautics Administration communications station or control tower.

§ 60.21 *Adherence to air traffic clearances.* When an air traffic clearance has been obtained under either the VFR or IFR rules, the pilot in command of the aircraft shall not deviate from the provisions thereof unless an amended clearance is obtained. In case emergency authority is used to deviate from the provision of an air traffic clearance, the pilot in command shall notify air traffic control as soon as possible and, if necessary, obtain an amended clearance. However, nothing in this section shall prevent a pilot, operating on an IFR traffic clearance, from notifying air traffic control that he is canceling his IFR flight plan and proceeding under VFR: *Provided,* That he is operating in VFR weather conditions when he takes such action.

§ 60.22 *Water operations.* An aircraft operated on the water shall, insofar as possible, keep clear of all vessels and avoid impeding their navigation. The following rules shall be observed with respect to other aircraft or vessels operated on the water:

(a) *Crossing.* The aircraft or vessel which has the other on its right shall give way so as to keep well clear;

(b) *Approaching head-on.* When aircraft, or an aircraft and vessel, approach head-on, or approximately so, each shall alter its course to the right to keep well clear;

(c) *Overtaking.* The aircraft or vessel which is being overtaken has the right-of-way, and the one overtaking shall alter its course to keep well clear;

(d) *Special circumstances.* When two aircraft, or an aircraft and vessel, approach so as to involve risk of collision, each shall proceed with careful regard to existing circumstances and conditions including the limitations of the respective craft.

NOTE: The rules for operating aircraft on the surface of the water conform to marine rules for the operation of vessels. The "Special circumstances" rule is provided for situations wherein it may be impracticable or hazardous for a vessel or another aircraft to bear to the right because of depth of a waterway, wind conditions, or other circumstances.

§ 60.23 *Aircraft lights.* Between sunset and sunrise:

(a) All aircraft in flight or operated on the ground or under way on the water shall display position lights;

(b) All aircraft parked or moved within or in dangerous proximity to that portion of any airport used for, or available to, night flight operations shall be clearly illuminated or lighted, unless the aircraft are parked or moved in an area marked with obstruction lights;

(c) All aircraft at anchor shall display anchor lights, unless in an area within which lights are not required for vessels at anchor; and

(d) Within the Territory of Alaska the lights required in paragraphs (a), (b), and (c) of this section shall be displayed during those hours specified and published by the Administrator.

60.24 Flight test. The following provisions shall apply to the flight testing of aircraft unless otherwise authorized by the Administrator under such conditions as he may prescribe:

(a) No person shall flight test an aircraft unless such flight test is conducted:

(1) Over open water or sparsely populated areas having light air traffic and approved by the Administrator; or

(2) Over an area designated by the Administrator.

(b) This section shall not apply to take-offs and landings and operations necessary for flights to and from approved flight areas of production aircraft and aircraft which have been subject to major alterations as defined in Part 18 of this subchapter.

(c) All flight tests shall be conducted in accordance with such traffic rules as the Administrator may from time to time prescribe.

VISUAL FLIGHT RULES (VFR)

§ 60.30 *Ceiling and distance from clouds.* Aircraft shall comply with the following requirements as to ceiling and distance from clouds:

(a) Within control zones. (1) Unless a clearance has been obtained from air traffic control, aircraft shall not be flown beneath the ceiling when the ceiling is less than 1,000 feet; or closer than 500 feet vertically under, 1,000 feet vertically over, or 2,000 feet horizontally from any cloud formation.

(2) When operating in accordance with a clearance issued by air traffic control, aircraft shall remain clear of clouds.

(b) *Elsewhere.* (1) when at an altitude of more than 700 feet above the surface, aircraft shall not be flown less than 500 feet vertically under, 1,000 feet vertically over, and 2,000 feet horizontally from any cloud formation;

(2) When at an altitude of 700 feet above the surface or less, aircraft shall not be flown unless clear of clouds.

60.31 Visibility. (a) Ground visibility within control zones. (1) Unless a clearance has been obtained from air traffic control, a pilot shall not take off or land an aircraft at an airport within a control zone or enter the traffic pattern of such an airport when the ground visibility is less than 3 miles.

(2) When operating in accordance with a clearance issued by air traffic control, a pilot shall not take off or land an aircraft, other than a helicopter, at an airport when the ground visibility is less than one mile: Provided, That where a local surface restriction to visibility exists, such as smoke, dust, or blowing snow or sand, the minimum visibility is one-half mile, if all turns after take-off and prior to landing and all flight beyond one mile from the airport boundary can be accomplished above or outside the area so restricted.

(b) Flight visibility within control zones. (1) Unless a clearance has been obtained from air traffic control, a pilot shall not operate an aircraft in flight within a control zone when the flight visibility is less than 3 miles.

(2) When operating in accordance with a clearance issued by air traffic control, a pilot shall not operate an aircraft, other than a helicopter, within a control zone when the flight visibility is less than one mile: Provided, That such aircraft may take off or land at an airport within a control zone or enter the traffic pattern of such an airport when the minimum visibility is one-half mile due to a local surface restriction such as smoke, dust, or blowing snow or sand, if all turns after take-off and prior to landing and all flight beyond one mile from the airport boundary can be accomplished above or outside the area so restricted.

(c) *Flight visibility within control areas.* When the flight visibility is less than 3 miles, no person shall operate an aircraft within a control area;

NOTE: When the flight visibility is less than 3 miles, operations within control areas are to be conducted in accordance with instrument flight rules. Flight below 700 feet above the surface is not within a control area. See definition of control area.

(d) *Flight visibility elsewhere.* When outside of control zones and control areas, no person shall operate an aircraft in flight when the flight visibility is less than one mile. However, helicopters may be flown at or below 700 feet above the surface when the flight visibility is less than one mile if operated at a reduced speed which will give the pilot of such helicopter adequate opportunity to see other air traffic or any obstruction

in time to avoid hazard of collision.

NOTE: When traffic conditions permit, air traffic control will issue an air traffic clearance for flights within, entering, or departing control zones when ground visibility or the flight visibility is less than 3 miles. The operator of any airport within a control zone, other than the airport upon which the control zone is centered, may secure continuing permission from air traffic control to conduct operations when the visibility is less than 3 miles: *Provided*, That such operations, at all times, remain 2,000 feet horizontally and 500 feet vertically from clouds, and traffic patterns are established and observed which avoid conflict with other operations. When outside of control zones and at an altitude of less than 700 feet above the surface, helicopters are permitted to fly when the flight visibility is less than one mile because of their special flight characteristics which allow them to proceed at low speed with safety.

New Amendment 60.32

60.32 VFR cruising altitudes. When an aircraft is operated in level cruising flight at 3,000 feet or more above the surface, the following cruising altitudes (Mean Sea Level) shall be observed:

(a) Below 29,000 feet. At an altitude appropriate to the magnetic course being flown as follows:

(1) 0° to 179° inclusive, at odd thousands plus 500 (3,500; 5,500; etc.).

(2) 180° to 359° inclusive, at even thousands plus 500 (4,500; 6,500; etc.).

(b) Above 29,000 feet. At an altitude appropriate to the magnetic course being flown as follows:

(1) 0° to 179° inclusive, at 4,000-foot intervals beginning at 30,000 (30,000; 34,000; etc.).

(2) 180° to 359° inclusive, at 4,000-foot intervals beginning at 32,000 (32,000; 36,000; etc.).

§ 60.33 *VFR flight plan.* If a VFR flight plan is filed, it shall contain such of the information listed in § 60.41 as air traffic control may require.

NOTE: Although flight plans are not required for VFR flight, air traffic control will accept such flight plans when desired by the pilot. Flights proceeding over sparsely populated areas or mountainous terrain may thus take advantage of any search and rescue facilities which may be available in emergencies. The information contained in such a flight plan is of importance to search and rescue operations.

INSTRUMENT FLIGHT RULES (IFR)

§ 60.40 *Application.* When aircraft are not flown in accordance with the distance-from-cloud and visibility rules prescribed in the visual flight rules, §§ 60.30–60.33, aircraft shall be flown in accordance with the rules prescribed in §§ 60.41–60.49.

60.41 IFR flight plan. Prior to operating in controlled airspace, a flight plan shall be filed with air traffic control. Such flight plan shall contain the following information unless otherwise authorized by air traffic control:

(a) Aircraft identification, and if necessary, radio call sign;

(b) Type of aircraft; or, in the case of a formation flight, the types and number of aircraft involved;

(c) Full name, address, and number of pilot certificate of pilot in command of the aircraft, or of the flight commander if a formation flight is involved;

(d) Point of departure;

(e) Cruising altitude, or altitudes, and the route to be followed;

(f) Point of first intended landing;

(g) Proposed true air speed at cruising altitude;

(h) Radio transmitting and receiving frequencies to be used;

(i) Proposed time of departure;

(j) Estimated elapsed time until arrival over the point of first intended landing;

(k) Alternate airport or airports, in accordance with the requirements of § 60.42;

(l) Amount of fuel on board expressed in hours;

(m) Any other information which the pilot in command of the aircraft, or air traffic control, deems necessary for air traffic control purposes;

(n) For international flights: The number of persons on board.

§ 60.42 *Alternate airport.* An airport shall not be listed in the flight plan as an alternate airport unless current weather reports and forecasts show a trend indicating that the ceiling and visibility at such airport will be at or above the following minimums at the time of arrival:

(a) *Airport served by radio directional facility.* Ceiling 1,000 feet, visibility one mile; or ceiling 900 feet, visibility 1½ miles; or, ceiling 800 feet, visibility 2 miles;

(b) *Airport not served by radio directional facility.* Ceiling 1,000 feet with broken clouds or better, visibility 2 miles;

(c) *Minimums at individual airports.* The Administrator may, in the interest of safety, prescribe higher ceiling and visibility minimums at individual airports than required by paragraph (a) or (b) of this section; and for individual operations at particular airports, may specify lower minimums if he shall find that such reduced minimums will not decrease safety.

NOTE: The minimums set forth in § 60.42 are required for clearance prior to take-off and are not intended to limit use of any alternate airport if weather conditions change while en route, in which event the published landing minimums shall apply. Minimums for particular airports which may be prescribed by the Administrator will be published in Parts 609 and 610 of this title, and also may be found in the Approach and Landing Charts of the Coast and Geodetic Survey, and in the Airman's Guide.

60.43 Air traffic clearance. Prior to operating in controlled airspace, an air traffic clearance shall be obtained from air traffic control.

New Amendment 60.44

60.44 IFR cruising altitudes. When an aircraft is operated in level cruising flight, it shall be operated in accordance with the following cruising altitudes:

(a) Within controlled airspace. At altitudes authorized by air traffic control. In absence of a specific altitude authorized by air traffic control, aircraft operating "on top" shall be flown at altitudes specified in 60.32.

(b) Outside controlled airspace—below 29,000 feet. At an altitude appropriate to the magnetic course being flown as follows:

(1) 0° to 179° inclusive, at odd thousands (1,000; 3,000; etc.).

(2) 180° to 359° inclusive, at even thousands (2,000; 4,000; etc.).

(c) Outside controlled airspace at and above 29,000 feet in Alaska and other territorial possessions of the United States. At an altitude appropriate to the magnetic course being flown as follows:

(1) 0° to 179° inclusive, at 4,000-foot intervals beginning at 29,000 (29,000; 33,000; etc.).

(2) 180° to 359° inclusive, at 4,000-foot intervals beginning at 31,000 (31,000; 35,000; etc.).

60.45 Course to be flown. Aircraft operating IFR in controlled airspace shall be flown as follows unless otherwise authorized by air traffic control:

(a) On civil airways. Along the center line of the airway.

(b) On other routes. Along the direct course between the navigational aids or fixes defining the route.

§ 60.46 *Instrument approach procedure.* When instrument let-down to an airport is necessary, a standard instrument approach procedure prescribed for that airport by the Administrator shall be used, unless:

(a) A different instrument approach procedure specifically authorized by the Administrator is used, or

(b) A different instrument approach procedure is authorized by air traffic control for the particular approach, provided such authorization is issued in accordance with procedures approved by the Administrator.

NOTE: Standard instrument approach procedures prescribed by the Administrator are published in Parts 609 and 610 of this title, and also may be found in the Approach and Landing Charts and Radio Facility Charts of the Coast and Geodetic Survey, and in the Airman's Guide. Such procedures have been carefully investigated with respect to pattern and terrain clearance. Safety would not permit several aircraft to make simultaneous use of more than one instrument approach procedure unless such operations were controlled.

§ 60.47 *Radio communications.* Within control zones and control areas the pilot in command of the aircraft shall ensure that a continuous watch is maintained on the appropriate radio frequencies and shall report by radio as soon as possible the time and altitude of passing each designated reporting point, or the reporting points specified by air traffic control, together with weather conditions which have not been forecast, and other information pertinent to the safety of flight.

NOTE: Designated reporting points are noted in publications of aids to air navigation. Control of air traffic is predicated on knowledge of the position of aircraft in flight. The reporting of unanticipated weather encountered en route such as icing or extreme turbulence may be of importance to the safety of other aircraft anticipating flight within the area.

§ 60.49 *Radio failure.* If unable to maintain two-way radio communications, the pilot in command of the aircraft shall:

(a) If operating under VFR conditions, proceed under VFR and land as soon as practicable, or

(b) Proceed according to the latest air traffic clearance to the radio facility serving the airport of intended landing, maintaining the minimum safe altitude or the last acknowledged assigned altitude whichever is higher. Descent shall start at the expected approach time last authorized or, if not received and acknowledged, at the estimated time of arrival indicated by the elapsed time specified in the flight plan.

DEFINITIONS

§ 60.60 *Definitions.* As used in this part, terms shall be defined as follows:

Acrobatic flight. Maneuvers intentionally performed by an aircraft involving an abrupt change in its altitude, an abnormal attitude, or an abnormal acceleration.

NOTE: The term "acrobatic flight" is not intended to include turns or maneuvers necessary to normal flight.

Air traffic. Aircraft in operation anywhere in the airspace and on that area of an airport normally used for the movement of aircraft.

Air traffic clearance. Authorization by air traffic control, for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within a control zone or control area.

Air traffic control. A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.

Aircraft. Any contrivance used or designed for navigation of or flight in the air, except a parachute or other contrivance designed for such navigation but used primarily as safety equipment.

Airplane. A mechanically propelled aircraft the support of which in flight is derived dynamically from the reaction on surfaces in a fixed position relative to the aircraft but in motion relative to the air.

Airport. A defined area on land or water, including any buildings and installations, normally used for the takeoff and landing of aircraft.

Airship. A mechanically propelled aircraft whose support is derived from lighter-than-air gas.

Alternate airport. An airport specified in the flight plan to which a flight may proceed when a landing at the point of first intended landing becomes inadvisable.

Balloon. An aircraft, excluding moored balloons, without mechanical means of propulsion, the support of which is derived from lighter-than-air gas.

Ceiling. The height above the ground or water of the lowest layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration" and not classified as "thin" or "partial."

Control area. An airspace of defined dimensions, designated by the Administrator, extending upwards from an altitude of 700 feet above the surface, within which air traffic control is exercised.

Control zone. An airspace of defined dimensions, designated by the Administrator, extending upwards from the surface, to include one or more airports, and within which rules additional to those governing flight in control areas apply for the protection of air traffic.

Cruising altitude. A constant altimeter indication, in relation to sea level, maintained during a flight or portion thereof.

Expected approach time. The time at which it is expected that an arriving aircraft will be cleared to commence approach for a landing.

Flight plan. Specified information filed either verbally or in writing with air traffic control relative to the intended flight of an aircraft.

Flight visibility. The average horizontal distance that prominent objects may be seen from the cockpit.

Glider. An aircraft without mechanical means of propulsion, the support of which in flight is derived dynamically from the reaction on surfaces in motion relative to the air.

Ground visibility. The average range of vision in the vicinity of an airport as reported by the U. S. Weather Bureau or, if unavailable, by an accredited observer.

Helicopter. A type of rotorcraft the support of which in the air is normally derived from airfoils mechanically rotated about an approximately vertical axis.

IFR. The symbol used to designate instrument flight rules.

IFR conditions. Weather conditions below the minimum prescribed for flights under VFR.

Magnetic course. The true course or track, corrected for magnetic variation, between two points on the surface of the earth.

Prohibited area. Airspace identified by an area on the surface of the earth within which the flight of aircraft is prohibited. A prohibited area may be established by the President of the United States or any State of the United States pursuant to the Air Commerce Act of 1926, or it may be established pursuant to the Civil Aeronautics Act of 1938, as amended.

Reporting point. A geographical cation in relation to which the posi of an aircraft is reported.

Restricted area. Airspace identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. A restricted area may be established by the President of the United States or by any State of the United States pursuant to the Air Commerce Act of 1926, or it may be established pursuant to the Civil Aeronautics Act of 1938, as amended, or it may be established by the Administrator of Civil Aeronautics pursuant to the provisions of § 60.13a.

Rotorcraft. An aircraft whose support in the air is chiefly derived from the vertical component of the force produced by rotating airfoils.

Sunset and sunrise. Sunset and sunrise are the mean solar times of sunset and sunrise as published in the Nautical Almanac converted to local standard time for the locality concerned, except within the Territory of Alaska.

NOTE: The Nautical Almanac containing sunshine tables may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Information is also available from the sunshine tables in the offices of the Civil Aeronautics Administration or the United States Weath Bureau.

Traffic pattern. The flow of aircraft operating on and in the vicinity of an airport during specified wind conditions as established by appropriate authority.

VFR. The symbol used to designate visual flight rules.

VFR conditions. Weather conditions equal to or above the minimum prescribed for flights under VFR.