CIVIL AIR REGULATIONS

PART 41—CERTIFICATION AND OPERATION RULES FOR SCHEDULED AIR CARRIER OPERATIONS OUTSIDE THE CONTINENTAL LIMITS OF THE UNITED STATES

As amended to July 20, 1948

CIVIL AERONAUTICS BOARD

Washington, D. C.

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41.0 Certificate.
- 41.00 Issuance.
- 41.000 Alaskan air carriers.
- 41.01 Compliance.
- 41.02 Duration.
- 41.03 Display.
- 41.04 Inspection.

Passenger Operation Rules

41.1 Route requirements.
- 41.10 Airport spacing.
- 41.11 Communications facilities.
- 41.12 Weather reporting services.
- 41.13 Navigational facilities.
- 41.14 Airport lighting facilities.

41.2 Aircraft requirements.
- 41.20 General.
- 41.21 Radio equipment.
- 41.22 First-aid and emergency equipment.
- 41.23 Oxygen apparatus.
- 41.24 Flight recorder.
- 41.25 Instruments and equipment required for continuance of flight.
- 41.26 Aircraft certification limitations.
- 41.27 Operating limitations upon airplanes certificated under transport category requirements.
- 41.28 Maintenance.
- 41.29 Cockpit check list.

41.3 Airman rules.
- 41.30 Pilot.
- 41.300 Certificate.
- 41.301 Number of pilots required.
- 41.302 Pilot route competency.
- 41.303 Maintenance of pilot technique.
- 41.304 Flight time limitations for pilots.
- 41.305 Logging flight time.
- 41.306 Pilots at controls.
- 41.307 First pilot rules.
- 41.308 Compliance with foreign air traffic rules and local airport rules.
- 41.309 Composition of flight crew.
- 41.31 Flight radio operator.
- 41.32 Flight engineer.
- 41.33 Flight navigator.
- 41.34 Dispatcher.

41.4 Flight operation rules.
- 41.40 Dispatching rules.
- 41.41 Flight preparation and take-off rules.
- 41.42 Flight course and en route rules.
- 41.43 Instrument approach and landing rules.

41.5 Miscellaneous operation rules.

Cargo Operation Rules

41.6–41.9 (In preparation.)
- 41.99 Definitions.

GENERAL

The following regulations are prescribed for scheduled air transportation operations conducted by air carriers between a place in any State of the United States, or the District of Columbia, and any place in a territory or possession of the United States; or between any place in a Territory or possession and a place in any other Territory or possession of the United States; or between places within a Territory or possession, except the Philippine Islands; or between any place in the United States and any place outside thereof; or between any two places outside the United States.

41.0 CERTIFICATE

41.00 Issuance. An air carrier operating certificate prescribing the type of operation, the routes over which such operation may be conducted, the airports which may be used, and such other specifications and restrictions as may be reasonably required in the interest of safety shall be issued by the Administrator to an applicant who demonstrates that he is capable of conducting the proposed operations in accordance with the applicable regulations hereinafter specified.

41.000 Alaskan air carriers. Whenever, upon investigation, the Administrator finds that the general standards of safety required for air carrier operations within the Territory of Alaska require or permit a deviation from any specific requirement of Part 41 for a particular operation or a class of operations for which an application for an air carrier operating certificate has been made, he may issue an air carrier operating certificate with appropriate changes, specifying therein the period during which such deviations may be permitted. The Administrator shall

promptly notify the Board of any deviations included in the air carrier operating certificates and the reasons therefor. All certificates issued under the authority of this section shall terminate not later than October 31, 1948.

41.01 Compliance. All operations shall be conducted in accordance with the specifications of the air carrier operating certificate and the rules contained in this Part.

41.02 Duration. An air carrier operating certificate will continue in effect until canceled, suspended, or revoked, after which it shall be surrendered to any officer or employee of the Administrator upon request.

41.03 Display. The air carrier operating certificate shall be available at the appropriate operations office for inspection by any authorized representative of the Administrator or Board.

41.04 Inspection. An authorized representative of the Administrator shall be permitted at any time and place to make inspections or examinations to determine the operator's compliance with the appropriate requirements of the Civil Air Regulations and the Civil Aeronautics Act of 1938, as amended.

PASSENGER OPERATION RULES

41.1 ROUTE REQUIREMENTS

41.10 Airport spacing. In the case of operations employing aircraft having 2 engines, airports adequate for the aircraft used shall be located so that the aircraft, when flying along the route, will at no time be at a greater distance therefrom than 45 minutes flying at normal cruising speed, except where the Administrator finds that because of the character of the terrain, the type of operation, and the performance of aircraft used adequate safety will be provided with airports spaced at greater distances.

41.11 Communications facilities. A two-way ground-to-aircraft radio communications system shall be available at such points as are necessary to insure adequate communication between plane and ground over the entire route.

41.12 Weather reporting services. Weather reporting services shall be available at such points along the route as are necessary to insure sufficient weather reports prepared from observations made and released by a source acceptable to the Administrator.

41.13 Navigational facilities.

(**a**) **Short distance operation.** Except in the case of a day contact operation where the characteristics of the terrain are such that navigation can be accomplished by reference to landmarks, each route shall be equipped with radio navigational facilities so located as to permit navigation by such facilities over the entire route. For instrument operation a facility shall be so located with respect to each scheduled stop and required alternate airport as to provide adequate means for making an instrument approach. In day instrument operation such a facility is not required at an alternate used only when the weather conditions are as good as or better than: broken clouds, ceiling 1,000 feet, visibility 2 miles, with conditions stable or improving.

(**b**) **Long distance operation.** Each route shall be equipped with radio navigational facilities so located as to permit the obtaining of reliable radio bearings when within 200 miles of any regular or approved alternate airport and a facility shall be so located with respect to each such airport as to provide adequate means for making an instrument approach: *Provided,* That the Administrator, at particular airports, may approve facilities which provide less coverage than that required herein if he finds that adequate safety is provided.

41.14 Airport lighting facilities. For night operation each scheduled stop and required alternate airport shall be equipped with adequate lighting facilities.

41.2 AIRCRAFT REQUIREMENTS

41.20 General.

(**a**) Aircraft shall be certificated and equipped in accordance with the airworthiness requirements of the Civil Air Regulations applicable to the type of operation conducted.

(**b**) Airplanes not certificated under the transport category requirements shall have such characteristics as to permit safe operation over the routes on which such airplanes will be operated.

(**c**) Land aircraft operated over water beyond gliding distance from shore without the aid of power shall be equipped with retractable landing gear.

(**d**) Multiengine airplanes shall be so equipped that engine rotation may be promptly stopped during flight.

(e) Operations which do not comply with the requirements of this Part will be permitted to continue for the duration of the war and 12 months thereafter if the Administrator finds that such continuation is necessary to the maintenance of an established service and that it will create no undue hazard under the particular conditions existing.

(f) Irrespective of the basis for certification, all aircraft possessing engine(s) rated at more than 600 hp. (each) for maximum continuous operation shall comply with the following, except that, if the Administrator finds that in particular models of existing aircraft 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: *Provided,* That compliance with the provisions of this section shall not be required in those instances where the air carrier notifies the Administrator and shows that there exists a lack of equipment or parts necessary for compliance with specific provisions contained in this section. However, when such equipment or parts become available the air carrier shall comply with the pertinent provisions as soon thereafter as practicable. This proviso and the privileges granted thereby shall not be effective after November 1, 1948.

(*1*) §§ 04b.075 and 04b.3824 (a) of the Civil Air Regulations;

(*2*) at the first major fuselage overhaul subsequent to May 1, 1947, but in any case not later than November 1, 1948, §§ 04b.38210, 04b.38230, 04b.3824 (b), (c), (d), 04b.38251, and 04b.38252 of the Civil Air Regulations;

(*3*) at the first major wing center-section overhaul subsequent to May 1, 1947, but in any case not later than November 1, 1948, §§ 04b.4113, 04b.4211, 04b.4231 (c), 04b.425 through 04b.4251, 04b.4320, 04b.4321, 04b.433, 04b.434, 04b.441 and subsections, 04b.470 through 04b.472, 04b.49 through 04b.4902, 04b.491 (a) and (c), and 04b.4910 through 04b.493 of the Civil Air Regulations.

41.21 Radio equipment.

41.210 Short distance operation.

(a) For day contact operations over routes on which navigation can be accomplished by visual reference to landmarks, each aircraft shall be equipped with such radio facilities as are necessary to accomplish the following:

(*1*) Transmit communications and meteorological information to at least one ground station from any point on the route and transmit, from a distance of not less than 25 miles, to airport traffic control towers located at airports approved for the route;

(*2*) Receive communications at any point on the route;

(*3*) By either of two independent means, receive meteorological information at any point on the route and receive instructions from airport traffic control towers located at airports approved for the route.

If appropriate, one of the means provided for compliance with paragraph (a) (3) may be employed for compliance with paragraph (a) (2).

(b) For day contact operations over routes on which navigation cannot be accomplished by visual reference to landmarks and for night contact, day or night instrument operations, each aircraft shall be equipped with such radio facilities as are necessary to accomplish the following:

(*1*) Transmit communications and meteorological information to at least one ground station from any point on the route and transmit, from a distance of not less than 25 miles, to airport traffic control towers located at airports approved for the route;

(*2*) Receive communications at any point on the route;

(*3*) By either of two independent means, receive meteorological information at any point on the route and receive instructions from airport traffic control towers located at airports approved for the route;

(*4*) By either of the two independent means, satisfactorily receive radio navigational signals from any radio aid to navigation required by § 41.13 (a).

If appropriate, one of the means provided for compliance with paragraph (b) (3) may be employed for compliance with paragraph (b) (2) or the means provided for compliance with paragraph (b) (4) may be employed for compliance with paragraph (b) (3).

41.211 Long distance operation. Each aircraft shall be equipped with such radio facilities as are necessary to accomplish the following:

(a) By either of two independent means, transmit communications and meteorological information to at least one ground station from any point on the route and transmit, from a distance of not less than 25 miles, to airport traffic control towers located at airports approved for the route;

(b) By either of two independent means, receive communications at any point on the route;

(c) By either of two independent means, receive meteorological information at any point on the route and receive instructions from airport traffic control towers located at airports approved for the route;

(d) By either of two independent means, satisfactorily receive radio navigational signals from any radio aid to navigation required by § 41.13 (b).

If appropriate, equipment provided for compliance with paragraph (c) may be employed for compliance with either paragraph (b) or paragraph (d).

41.22 First-aid and emergency equipment. Each aircraft shall be equipped with a conveniently accessible first-aid kit adequate for the type of operation involved. Aircraft scheduled over routes requiring flights for long distances over uninhabited terrain must carry such additional emergency equipment as the Administrator designates for the particular operation involved. All aircraft operated over water shall be equipped with life preservers or flotation devices readily available for each person aboard and with a Very pistol or equivalent signal equipment, except that this requirement will not apply when such operations consist only of landings, take-offs, or flights for short distances over water and the Administrator finds in each case that such equipment is not necessary. In addition, all aircraft operated for long distances over water shall be equipped with a sufficient number of life rafts to accommodate adequately all occupants and such additional emergency equipment as may be required by the Administrator.

41.23 Oxygen apparatus.

(a) Aircraft not having pressurized cabins and operated at an altitude exceeding 10,000 feet above sea level continuously for more than 30 minutes or at an altitude exceeding 12,000 feet above sea level for any length of time shall be equipped with effective oxygen apparatus and an adequate supply of oxygen available for the use of the operating crew. Such aircraft shall also be equipped with an adequate separate supply of oxygen available for the use of passengers when operated at an altitude exceeding 12,000 feet above sea level.

(b) Unless oxygen is supplied in accordance with paragraph (a), aircraft having pressurized cabins shall not be operated with a pressure within the cabin less than that corresponding to a pressure altitude of 10,000 feet. Aircraft having pressurized cabins and operated at altitudes in excess of 18,000 feet above sea level shall be equipped with an adequate emergency supply of oxygen available for the use of the flight crew.

41.25 Instruments and equipment required for continuance of flight. If any required instrument or item of equipment in an aircraft becomes unserviceable in flight, a landing must be made at either the nearest suitable landing area or at the next point of intended landing whichever, in the opinion of the pilot, is the safer procedure, unless the equipment specified below for the type of operation indicated is in serviceable condition, in which case the flight may continue as scheduled to the nearest point where repairs or replacements can be made.

The items listed below are required for all types of operation unless otherwise specified:

(a) one air-speed indicator and one sensitive type altimeter (contact operation); two air-speed indicators and two sensitive type altimeters (instrument operation),

(b) one approved compass,

(c) a tachometer for one engine, one fuel-pressure gage with warning indicator, one oil-pressure gage with warning indicator, and one oil-temperature or cylinder-temperature gage for each engine,

(d) a manifold pressure gage for one engine,

(e) in addition to fire detecting and fire extinguishing equipment necessitated as a result of compliance with § 41.20 (f) (2) and (3), a minimum of two hand fire extinguishers of an approved type with an approved extinguishing agent, one of which installed in the crew compartment, others readily accessible to the passengers. Such additional hand fire extinguishers as the Administrator finds necessary for compliance with § 41.20 (f) (2).

(f) one landing-gear position indicator or equivalent facility, if equipment includes a retractable landing gear,

(g) one or more storage batteries or other source of electrical supply sufficient to operate all radio and electrical equipment necessary for the flight,

(h) two of the following three units of radio equipment:

(*1*) one transmitter for two-way communication,

(*2*) one receiver for two-way communication,

(*3*) one receiver capable of receiving navigational signals.

In addition to the above, one of the radio navigational systems required by § 41.210 (b), if navigational facilities on the route are required by § 41.13.

(i) all radio equipment required by these regulations (night and instrument operation),

(j) forward position and tail lights, two landing lights, one set of instrument lights, and two landing flares each rated for at least 3-minute duration (night operation),

(k) fuel quantity indicators indicating the amount of fuel in each tank to be used for the remainder of the flight (night and instrument operation),

(l) an electrically heated pitot tube serving each pilot's air-speed indicator (night and instrument operation),

(m) one gyro rate-of-turn indicator combined with a bank indicator, one artificial horizon indicator, and one gyro direction indicator (night and instrument operation),

(n) one outside air temperature gage with indicating dial in the pilot compartment and one carburetor air temperature indicator or equivalent approved device (night and instrument operation),

(o) if vacuum system is used, one vacuum gage with warning indicator on the instrument panel installed in lines leading to the rate-of-turn and artificial horizon indicators and the gyro direction indicator (night and instrument operation),

(p) one clock with sweep-second hand (night and instrument operation),

(q) three spare fuses of each capacity, or 25 percent of the number of each capacity, whichever is the greater.

41.26 Aircraft certification limitations.

(a) Aircraft certificated as a basic type after June 30, 1942, shall be certificated in accordance with Part 04b, or the transport category requirements of Part 04a, and shall meet the requirements of § 41.27 over each route to be flown.

(b) Aircraft certificated as a basic type prior to June 30, 1942, shall either:

(*1*) retain their present airworthiness certification status and shall be operated in accordance with such operating limitations as the Administrator finds will provide a safe relation between the performance of the aircraft and the dimensions of airports and terrain; or

(*2*) qualify by showing compliance with either the performance requirements contained in §§ 04a.75–T through 04a.7533–T, or the requirements contained in Part 04b, and when so qualified shall meet the requirements of § 41.27 over each route to be flown: *Provided,* That should any model be so qualified all aircraft of any one operator of the same or related models shall be similarly qualified and operated.

(c) Aircraft used after December 31, 1953, shall comply with all of the requirements of Part 04b or the transport category requirements of Part 04a, and shall meet the requirements of § 41.27 over each route to be flown.

41.27 Operating limitations upon airplanes certificated under transport category requirements. When operating any airplane certificated in accordance with the provisions of § 04b.1 or of § 04a.75–T the provisions of §§ 41.270 to 41.2731, inclusive, shall apply unless deviations therefrom are specifically authorized by the Administrator when he finds that, due to a peculiarity of a specific case, such application is unnecessary for safety.

In determining compliance with these provisions the data obtained in testing the airplane for type certification may be applied, by interpolation or by computation of the effects of changes in specific variables, to conditions differing from those for which specific tests were made, where such interpolations or computations will give results substantially equalling in accuracy the results of a direct test.

41.270 General limitations.

(a) Airplanes shall be operated only from airports at altitudes within the altitude range for which maximum take-off weights have been determined and set forth in the airplane operating manual and shall be dispatched only to airports of intended destination, or to airports specified as alternates, which are at altitudes within the range for which maximum landing weights have been determined and set forth in the airplane operating manual.

(b) The weight of an airplane at take-off shall not exceed the certificated maximum take-off weight for the altitude of the airport from which the take-off is made.

(c) The weight at take-off shall be such that, allowing for the consumption of the amount of fuel and oil which would normally be consumed in flight to the intended destination, the weight on arrival at the destination will not exceed the certificated maximum landing weight for the altitude of the airport of intended destination.

41.271 Take-off limitations to provide for engine failure. Take-offs shall be made only from such airports, in such directions, and under such weight limitations that the following condi-

tions are fulfilled as shown by the performance data determined under § 04b.12 or § 04a.7532–T and set forth in the airplane operating manual:

(**a**) From any point on the take-off up to the time of attaining the critical-engine-failure speed set forth in the airplane operating manual it shall be possible to bring the airplane to a safe stop within the landing area, as shown by the accelerate-and-stop distance data.

(**b**) If the critical engine should fail at any instant after the airplane attains the critical-engine-failure speed, it shall be possible 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 take-off area. Thereafter it must 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 300 feet horizontally after passing beyond such boundaries.

In determining the allowable deviation of the flight path in order to avoid obstacles, it is assumed that the airplane is not banked before reaching a height of 50 feet, as shown by the take-off path data, and that the maximum bank thereafter does not exceed 15°.

(**c**) In applying the requirements of paragraphs (a) and (b) correction shall be made for any gradient of the take-off surface. Take-off data based on still air may be corrected to allow for the effect of a favorable wind which is equal to not more than 50 percent of the component along the take-off runway due to the reported wind condition.

41.272 En route limitations.

41.2720 All airplanes—all engines operating. Airplanes shall be dispatched only at such take-off weights that, in proceeding along the intended track with the weight of the airplane progressively reduced by the anticipated consumption of fuel and oil, the rate of climb with all engines operating (as set forth in the airplane operating manual) shall be, in feet per minute, $6V_{s_0}$ at an altitude at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles of either side of the intended track; except that this requirement need not apply to airplanes certificated under the performance requirements of Part 04a.

41.2721 All airplanes—one engine inoperative. Airplanes shall be dispatched only at such take-off weights that in proceeding along the intended track with the weight of the airplane progressively reduced by the anticipated consumption of fuel and oil, the rate of climb with one engine inoperative (as set forth in the airplane operating manual) shall be, in feet per minute, $0.02V_{s_0}^2$ for airplanes having maximum take-off weights up to 40,000 pounds, increasing linearly to $0.04V_{s_0}^2$ at 60,000 pounds, and $0.04V_{s_0}^2$ for maximum take-off weights above 60,000 pounds at an altitude at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles of either side of the intended track; except that for airplanes certificated under the performance requirements of Part 04a, the above rate-of-climb value may be $0.02V_{s_0}^2$ irrespective of maximum take-off weight.

41.2722 Airplanes with four or more engines—two engines inoperative. If from any point along the track flown, more than 90 minutes at "all engines operating" cruising speed is required to reach an available landing area where the provisions of § 41.273 as modified by § 41.2730 can be met at the airplane weight estimated to exist upon arrival there, an aircraft with four or more engines shall not be dispatched over such track unless its weight is such as to permit a rate of climb with two engines inoperative (as set forth in the airplane operating manual), in feet per minute, of $0.01V_{s_0}^2$ 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 to the landing area; or at 5,000 feet, whichever is higher, except that this requirement need not apply to airplanes certificated under the performance requirements of Part 04a. This specified rate of climb shall correspond to the airplane's weight attained at the moment of failure of the second engine (assumed to occur 90 minutes from time of departure), or to the weight which may be attained by dumping fuel at the moment of failure of the second engine, provided that sufficient fuel is retained aboard the airplane to reach a point 1,000 feet directly above the landing area.

41.2723 Special air navigation facilities. Where special air navigation facilities provide for reliable and accurate identification of high ground or obstruction extending for less than 20 miles along the track, the lateral distance of 10 miles specified in § 41.2720 through § 41.2722 may be reduced to 5 miles.

41.273 Landing distance limitations.

(**a**) An airplane shall be dispatched only under such conditions that it would be possible, as shown by the still-air landing data obtained in § 04b.124 or § 04a.7533–T and set forth in the airplane operating manual, at a weight corresponding to the maximum weight expected to exist at the time of arrival at the airport of intended destination, and under standard air

conditions for the altitude of such airport, to bring the airplane to rest from a point 50 feet directly above the intersection of the obstruction clearance line (as defined in § 41.2731) and the landing surface, within a total distance not in excess of 60 percent of the effective length of the landing area (as defined in § 41.2731) most suitable for landing in still air.

(b) For every anticipated condition of wind velocity and direction and the corresponding landing direction required at the airport of intended destination by the ground handling characteristics of the airplane type involved the ratio of landing distance to effective length of landing area shall not be greater than that as specified in paragraph (a), after allowing for the effect on the landing path and roll of not more than 50 percent of the favorable wind component due to a particular wind condition.

(c) If the requirement of paragraph (a) can be met, but the requirement of paragraph (b) cannot be fully met, at an airport of intended destination, a flight to such airport may be dispatched if at least one approved alternate airport is designated in the flight plan at which the requirements of paragraphs (a) and (b) of this section, as modified by § 41.2730, are met.

41.2730 Landing distance at alternate fields. The conditions of § 41.2731 will apply with respect to alternate airports specified in the flight plan, except that in the case of alternate airports the landing distance as defined in that section shall not exceed 70 percent of the effective length of the landing area.

41.2731 Definition of effective length of landing area. The effective length of the landing area is the distance from the point where the obstruction clearance line, as defined below, intersects the landing surface to the far end of the landing area.

The obstruction clearance line is a line drawn tangent to or clearing all obstructions showing in a profile of the approach area as defined below. The obstruction clearance line is further limited by having a slope to the horizontal of 1/20 as it approaches the landing area.

The approach area, as used in this section, shall be an area symmetrical about a center line coinciding with and prolonging the center line of the runway, except that where there is a multiplicity of parallel runways or a large area continuously available for landing, the center line of the approach area shall coincide with the most probable landing path for instrument approaches. The approach area shall be considered as extending longitudinally from the landing area out to the most remote obstacle touched by the obstruction clearance line, assuming the center line of the approach area in plan view to be straight for at least 1,500 feet from the intersection of the obstruction clearance line with the landing surface, and thereafter continuing in a path consistent with the instrument approach procedures for the runway in question, or, where such procedures are not specified, consistent with turns of at least 4,000 feet in radius; and as extending laterally to a distance of 200 feet on either side of its center line at the point of intersection of the obstruction clearance line with the landing surface, with this distance increasing uniformly to 500 feet on either side of the center line of the area at a longitudinal distance of 1,500 feet from the intersection of the obstruction clearance line with the landing surface, and maintaining a distance of 500 feet from the center line thereafter.

41.28 Maintenance.

41.280 Maintenance organization. The air carrier is responsible for the continuous airworthiness of all aircraft, engines, propellers, and appliances. Unless maintenance is performed by another agency under a contract approved by the Administrator, it is responsible for maintaining adequate maintenance facilities, the adequacy and competence of maintenance personnel, and for the preparation of such maintenance reports as are required by the Administrator.

41.281 Alterations and repairs. Aircraft, engines, propellers, and appliances must be altered or repaired only in conformity with the procedures and, insofar as they apply, the methods provided for in Part 18. Reports of such alterations or repairs must be submitted promptly to the Administrator.

41.282 Inspection. The air carrier shall maintain an inspection organization which is responsible for determining that all maintenance conforms to at least the minimum standards prescribed by the Administrator as to workmanship, methods employed, and materials used. Each inspector must hold a valid mechanic certificate and rating for the type of inspection involved.

41.283 Maintenance manual. The air carrier shall prepare and maintain a manual for the use and guidance of maintenance personnel which contains full information pertaining to the repair and service of flight equipment and clearly outlines the responsibilities of maintenance personnel. It must be in a form approved by the Administrator and copies furnished to all persons designated by the Administrator or Board. All copies in the hands of designated company personnel must be kept up to date.

41.2830 Changes. The extension of any overhaul, check, or inspection period must have the written approval of the Administrator. Other changes in the maintenance manual may be made without the prior approval of the Administrator, if such changes are not inconsistent with any Federal regulation, the air carrier operating certificate, or safe maintenance practice.

41.284 Training program. The air carrier must provide for the proper and periodic instruction of all maintenance personnel, particularly in connection with the introduction into service of new or unfamiliar equipment.

41.285 Records. Current records shall be kept of the total time in service, the time since last overhaul, and the time since last inspection on all aircraft components, engines, propellers, and, where practicable, on instruments, equipment, and accessories.

41.29 Cockpit check list.

(a) The air carrier shall provide for each make and model aircraft a cockpit check list, approved by the Administrator, adapted to each operation in which the aircraft is to be utilized. An approved check list shall be installed in a readily accessible location in the cockpit of each aircraft and shall be appropriately used by the flight crew for each flight.

(b) The cockpit check list shall include procedures prior to starting engines, prior to take-off, prior to landing, and for powerplant emergencies.

41.3 AIRMAN RULES

41.30 Pilot.

41.300 Certificate.

(a) Any pilot serving as first pilot shall hold a valid airline transport pilot certificate and a rating for the aircraft in which he is to serve.

(b) Any pilot serving as second pilot in an aircraft requiring two pilots shall hold at least a commercial pilot certificate and instrument rating and must have demonstrated to an air carrier inspector of the Administrator, or to an authorized check pilot of the air carrier, his ability to take off and land aircraft in which he is to serve.

(c) Any pilot serving as second pilot in an aircraft requiring three or more pilots shall meet the requirements of paragraph (a) of this section: *Provided,* That until June 1, 1946, any pilot may serve as second pilot in an aircraft requiring three or more pilots, if he holds at least a commercial pilot certificate and instrument rating and has demonstrated to an air carrier inspector of the Administrator or to an authorized check pilot of the air carrier his ability to take off and land aircraft in which he is to serve.

(d) Any pilot serving in a pilot capacity other than as first or second pilot shall meet the requirements of paragraph (b) of this section.

41.301 Number of pilots required. The number of pilots required shall be sufficient to provide adequate safety. The type of aircraft used, the type of operation involved, and the duration of flights between points where flight crews are changed shall be the basis for making this determination.

41.302 Pilot route competency.

41.3020 Requirements for pilot route qualification. A pilot qualifying on any route must be certified by a check pilot as qualified for the route and shall have accomplished at least the applicable procedures prescribed below:

(a) A pilot who has served as first pilot for less than 1,000 hours shall have made, within the preceding 12 calendar months, 4 one-way trips over the route as pilot without passengers or as copilot with or without passengers. One of the above trips must have been completed within the preceding 60 days, and the pilot qualifying must have been accompanied on this trip by a check pilot.

(b) A first pilot who has served as such on any route or routes for at least 1,000 hours, in order to qualify for any other route, shall have made, within the preceding 12 calendar months, 2 one-way trips as pilot without passengers or as copilot with or without passengers. One of the above trips must have been completed within the preceding 60 days, and the pilot qualifying must have been accompanied on this trip by a check pilot.

(c) In complying with the requirements of paragraphs (a) and (b), the qualifying pilot shall have performed in flight, under actual or simulated instrument conditions, all of the approved instrument approach procedures at each regular, provisional, and refueling and holding airport approved for the route. In the case of airports used only as alternates, the pilot may demonstrate his ability by other means approved by the Administrator.

(d) In the case of minor extensions or modifications of existing routes the provisions of paragraphs (a) and (b) will not apply, unless found necessary by the Administrator in the interest of safety.

(e) In the case of new regular, provisional, or refueling and holding airports approved

for a route, a first pilot currently qualified for the route need not be required to perform the approach procedures specified in paragraph (c) if the Administrator finds in each case that such procedure is unnecessary in the interest of safety.

41.3021 Maintenance of pilot route qualification. A first pilot shall not serve as such over a particular route unless he has either:

(a) made at least one one-way trip over the route as first or second pilot within the preceding 12 calendar months, or

(b) after an absence from the route of more than 12 consecutive months, requalified in accordance with the appropriate provisions of § 41.3020.

41.303 Maintenance of pilot technique. If within any 90-day period a first or second pilot has not made at least three take-offs and landings in aircraft of a particular make and model, such person shall not thereafter serve as a first or second pilot in aircraft of that make and model in scheduled air transportation without having made at least three take-offs, and landings in such aircraft with not less than one-half the maximum useful load. If he is to serve in air transportation at night at least one of the three take-offs and landings specified above must have been made at night.

41.3030 Periodic flight checks and instruction. Each air carrier must provide a sufficient number of check pilots to insure that each first pilot employed continues to meet the minimum requirements both with regard to route competency and technique. Each of these checks must be accomplished twice each year at intervals of not less than 4 months. Periodic instruction must be given all pilots. In the case of first pilots, instruction must include the obtaining of optimum performance under simulated maximum authorized weight conditions with one engine inoperative and instrument approach procedures and landings under the same conditions in the make and model aircraft in which such pilots serve in scheduled air transportation. In the case of all pilots other than first pilots, instruction must include familiarization with the operations manual, with the types of equipment used, and with the duties of a second pilot.

41.304 Flight time limitations for pilots.

41.3040 Aircraft having a crew of one or two pilots.

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

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

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

(d) A pilot shall not fly as a member of the crew more than 100 hours during any one month: *Provided,* That the Administrator is authorized, during the present war and until 6 months after the termination thereof, to permit the maximum of 100 hours to be exceeded to the extent necessary to complete a particular flight for military purposes.

(e) A pilot shall not fly as a member of the crew more than 1,000 hours in any 12-month period: *Provided,* That this limitation will not be effective during the present war and until 6 months after the termination thereof, and that during this period the maximum flying hours permitted in any 12-month period will be controlled by the provisions of paragraph (d) of this section.

41.3041 Aircraft having two pilots and one additional flight crew member.

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

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

(c) A pilot shall not fly as a member of the flight crew more than 120 hours in any 30 consecutive days or 300 hours in any 90 consecutive days: *Provided,* That the Administrator is authorized, during the present war and until 6 months after the termination thereof, to permit the above maximums of 120 or 300 hours to be exceeded to the extent necessary to complete a particular flight for military purposes.

787171—48—2

(d) A pilot shall not fly as a member of the flight crew more than 1,000 hours in any 12-month period: *Provided,* That this limitation will not be effective during the present war and until 6 months after the termination thereof and that during this period a maximum of 1,200 flying hours will be permitted.

41.3042 Aircraft having three or more pilots and an additional flight crew member.

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

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

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

(d) A pilot shall not fly as a member of the flight crew more than 1,000 hours in any 12-month period: *Provided,* That this limitation will not be effective during the present war and until 6 months after the termination thereof and that during this period a maximum of 1,200 flying hours will be permitted.

41.3043 Pilots not regularly assigned. A pilot not regularly assigned as a flight crew member for an entire month under the provisions of §§ 41.3041 or 41.3042 must not fly in excess of 100 hours in any 30 consecutive days.

41.3044 Deadhead transportation. The time spent in deadhead transportation to or from duty assignment will not be considered a part of any rest period.

41.3045 Other commercial flying. A pilot shall not do other commercial flying while employed by an air carrier when such flying, in addition to that in scheduled air transportation service, will exceed any flight time limitations specified herein.

41.305 Logging flight time.

(a) A first pilot may log the total flight time elapsing during his command of the aircraft.

(b) A second pilot holding an airline transport pilot certificate and rating for the aircraft flown may log the total time during which he serves as second pilot.

(c) A second pilot not holding an airline transport pilot certificate and rating for the aircraft flown may log 50 percent of the total flight time.

(d) Additional pilots when required, and serving as such, may log 50 percent of the total flight time.

41.3050 Logging instrument flight time. Instrument flight time may be logged as such by the pilot actually manipulating the controls only when the aircraft is flown solely by reference to instruments either under actual or properly simulated flight conditions.

41.306 Pilots at controls. In the case of aircraft requiring two or mor more pilots, two pilots shall remain at the controls at all times while the aircraft is taking off, landing, and while en route, except when the absence of one is necessary in connection with his regular duties or when he is replaced by a person authorized under the provisions of § 41.501.

41.307. First pilot rules.

(a) **Pilot in command.** The first pilot is in command of the aircraft at all times during flight and is responsible for the safety of persons and goods carried and for the conduct and safety of members of the crew.

(b) **Emergency decisions.**

(*1*) The first pilot is authorized to follow any course of action which appears necessary in emergency situations which, in the interest of safety, require immediate decision and action. He may, in such situations, deviate from prescribed methods, procedures, or minimums to the extent required by considerations of safety. When such emergency authority is exercised the pilot shall keep the proper control station fully informed regarding the progress of the flight. He shall submit a written report of any such deviation to the Administrator of Civil Aeronautics within 7 days after the completion of the trip.

(*2*) In an emergency requiring either the dumping of fuel or a landing at a weight in excess of the authorized landing weight the first pilot may elect to follow whichever procedure he considers safer.

(c) **Flight equipment.** Before any flight is started the first pilot shall have readily available in the aircraft appropriate and current flight and navigational facility maps, including

instrument procedures when instrument flight is authorized, and such other equipment as may be necessary to properly conduct the proposed flight.

41.308 Compliance with foreign air traffic rules and local airport rules. Pilots flying in the airspace of any foreign country shall, at all times, comply with the air traffic rules of the foreign government and with local airport rules except where any rule prescribed herein is more restrictive and may be followed without violating the laws or rules of such country.

41.309 Composition of flight crew. The minimum flight crew shall be determined by the Administrator on the proving flights by applying the standards hereinafter prescribed for each route or segment thereof to be flown. Where such flights already have been accomplished the Administrator shall make the determination by review of the proving flights and such other inspection as he finds necessary. The kind and number of crew members thus determined shall be specified in the air carrier operating certificate.

41.31 Flight radio operator.

41.310 When required. An airman holding a flight radio operator certificate shall be required solely for communication for that route or segment thereof over which the Administrator has determined that radiotelegraphy is necessary for communication with ground stations during flight.

41.311 Certificate. Effective November 15, 1947, each flight radio operator shall hold a valid flight radio operator certificate issued in accordance with the provisions of Part 33.

41.312 Flight time limitations. When one flight radio operator is required the flight time limitations prescribed in § 41.3041 apply. When two or more flight radio operators are required the flight time limitations of § 41.3042 apply.

41.313 Other flight crew members to be qualified. In all flights requiring only one flight radio operator, one other flight crew member must be capable of operating the equipment in an emergency.

41.314 Qualification for duty. A certificated flight radio operator shall not be assigned to nor perform duties for which he is required to be certificated unless, within the preceding 12-month period, he has had at least 4 months of satisfactory experience as a radiotelegraph operator and 25 hours of experience in the operation of aircraft radio during flight; or until the air carrier has checked the airman and has determined that he is (1) familiar with all current radio information pertaining to the routes to be flown and (2) competent with respect to the operating procedures and radio equipment to be used.

41.32 Flight engineer.

41.320 When required. After December 1, 1948, an airman holding a flight engineer certificate shall be required solely as a flight engineer on all aircraft certificated for more than 80,000 pounds maximum take-off weight, and on all other aircraft certificated for more than 30,000 pounds maximum take-off weight where the Administrator has found that the design of the aircraft used or the type of operation is such as to require engineer personnel for the safe operation of the aircraft.

41.321 Certificate. Effective November 15, 1947, each flight engineer shall hold a valid flight engineer certificate issued in accordance with the provisions of Part 35.

41.322 Qualification for duty. A certificated flight engineer shall not be assigned to nor perform duties for which he is required to be certificated unless, within the preceding 12-month period, he has had at least 50 hours of experience as a flight engineer on the make and model aircraft on which he is to serve; or until the air carrier has checked the airman and determined that he is (1) familiar with all current information and operating procedures relating to the make and model aircraft to which he is to be assigned and (2) competent with respect to such aircraft.

41.323 Flight time limitations. When one flight engineer is required, the flight time limitations prescribed in § 41.3041 apply. When two or more flight engineers are required, the flight time limitations prescribed in § 41.3042 apply.

41.324 Other flight crew members to be qualified. In all flights requiring the use of only one flight engineer, one other flight crew member must be capable of performing the duties of such engineer in an emergency during flight.

41.33 Flight navigator.

41.330 When required. An airman holding a flight navigator certificate shall be required solely for navigation for that route or segment thereof for which the Administrator has determined that:

(**a**) celestial navigation is necessary, or

(**b**) other specialized means of navigation necessary for the safe conduct of flight cannot be adequately accomplished from the pilot station.

41.331 Flight time limitations. The flight time limitations prescribed in § 41.3042 apply.

41.332 Qualification for duty. A certificated flight navigator shall not be assigned to nor perform duties for which he is required to be certificated unless, within the preceding 12-month period, he has had at least 50 hours of experience as a flight navigator; or until the air carrier has checked the airman and determined that he is (1) familiar with all current navigational information pertaining to the routes to be flown and (2) competent with respect to the operating procedures and navigational equipment to be used.

41.34. Dispatcher.

41.340 Number and location. The air carrier shall provide an adequate number of certificated aircraft dispatchers located at such points as may be necessary to insure safe operations.

41.341 Certificate. Each dispatcher shall hold a valid aircraft dispatcher certificate issued in accordance with the provisions of Part 27.

41.342 Qualification for route. Each dispatcher within 6 months immediately preceding his qualification for a route, or part thereof, shall have made at least one trip over the route on which he is to serve prior to dispatching any aircraft. In addition he must be familiar with:

(**a**) the contents of the air carrier operations manual;

(**b**) the radio facilities in the aircraft used; and

(**c**) with respect to the route, the following:

(*1*) the prevailing weather phenomena,

(*2*) the sources of weather information available.

(*3*) all phases of the air carrier operation,

(*4*) the maximum authorized loads for the aircraft used,

(*5*) the peculiarities and limitations of each radio navigational facility and similar information with regard to such additional facilities located off the route as are approved for use in obtaining fixes by means of cross bearings, and

(*6*) the effect of weather conditions on the radio reception of the aircraft used.

41.343 Maintenance of qualification. Each dispatcher shall maintain his familiarity with the route or routes on which he dispatches aircraft.

41.344 Route qualification expiration. After 24 consecutive months of absence from dispatching duty over a route, or part thereof, a dispatcher will no longer be considered qualified to dispatch aircraft over such route.

41.4 FLIGHT OPERATION RULES

41.40 Dispatching rules.

(**a**) **Short distance operation.** Flights may be dispatched over any approved route between two terminal points.

(**b**) **Long distance operation.** Flights may be dispatched over any track between two terminal points within the route approved by the Administrator for the operation.

41.400 Dispatching authorization. Flights shall be started only on the authority of an aircraft dispatcher qualified for the route. In short distance operation this authority is not required at intermediate points specified in the original clearance unless the flight is delayed more than 30 minutes at any such point. In long distance operation redispatch is not required unless the flight is delayed more than 6 hours.

41.401 Dispatcher duty period. A dispatcher may clear a flight only when he has been on duty at the station from which the clearance is effected for a period of time sufficient to become familiar with existing conditions. He must continue on duty until the aircraft has landed in completion of a trip, or has proceeded beyond his jurisdiction, or until he has been properly relieved by another qualified dispatcher.

41.402 Use of weather reports and forecasts in dispatch.

(**a**) Weather reports used to control flight movements shall be prepared from observations made and released by a source acceptable to the Administrator.

(**b**) Weather reports used shall be the latest reports available. Weather reports, other than off-course or on-call reports made a part of the clearance form, shall not be more than 1 hour and 30 minutes old at the time the aircraft departs.

(**c**) Weather forecasts made by the United States Weather Bureau, in the case of dispatch from points within the United States, or other sources acceptable to the Administrator, in the case of dispatch from points outside of the United States, shall be taken into account.

41.403 Weather minimums.

41.4030 Dispatch under contact flight rules, short distance operation. Aircraft may be dispatched only if current weather reports and forecasts show a trend indicating that the

intended landing and commence descent at approach time last authorized or, if not received and acknowledged, at the estimated time of arrival specified in the flight plan; or

(b) if weather conditions permit, proceed in accordance with contact flight rules; or

(c) land as soon as practicable.

41.43 Instrument approach and landing rules.

41.430 Altitude on initial approach. When making an initial approach to a radio station on instruments or on top of overcast, an aircraft shall not be operated below the initial approach altitude specified for such station until arrival over the station has been definitely established, except where a marker facility is available and a procedure for a straight-in approach is authorized.

41.431 Letting-down-through procedure. When instrument operation is authorized the standard instrument approach procedure, or the one authorized by the control tower if more than one procedure is specified for the airport, must be used for letting-down-through. The procedures and minimum altitudes of flight specified shall be strictly observed.

41.432 Approach and landing limitations. No instrument approach procedure shall be executed or landing made at an airport when the latest U. S. Weather Bureau weather report for that airport indicates the ceiling or visibility to be less than that prescribed by the Administrator for landing at such airport.

41.5 MISCELLANEOUS OPERATION RULES

41.500 Operations manual.

(a) The air carrier shall prepare and maintain a manual for the use and guidance of operations personnel which contains full information necessary to guide flight and ground personnel in the conduct of flight operations and to inform such personnel regarding their duties and responsibilities. It must be in a form approved by the Administrator and furnished to all persons designated by the Administrator or Board. All copies in the hands of company personnel must be kept up-to-date.

(b) Any changes issued by the Administrator shall be promptly incorporated in the manual. Other changes not inconsistent with any Federal regulation, the air carrier operating certificate, or safe operating practice may be made without the prior approval of the Administrator.

41.501 Admission to pilot compartment.

(a) No person except a member of the operating crew or an air carrier inspector of the Administrator may be admitted to the pilot compartment during flight unless his admission is approved by the first pilot after he has identified himself as one of the following:

(*1*) An employee of the Federal Government, or an air carrier, or other aeronautical enterprise whose duties are such that his presence in the compartment is necessary or advantageous to the conduct of safe air carrier operations or the improvement of the safety of such operations;

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 in the pilot compartment may be considered eligible for admission to the pilot compartment 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 § 41.501 (a) (2).

(*2*) A person whose presence in such compartment has been specifically authorized by the management of the air carrier operating the aircraft and by the Administrator.

(b) No person may occupy a seat in the pilot compartment or the companionway thereto unless such seat is securely attached to the structure of the aircraft and is provided with a safety belt which shall be kept fastened by the occupant throughout his occupancy of such seat.

(c) Unless a seat is also available for his use in the passenger compartment, no person may be admitted to the pilot compartment during flight except:

(*1*) air carrier inspectors engaged in checking flight operations; and

(*2*) certificated airmen of the air carrier and certificated airmen of another air carrier who have been authorized by the air carrier concerned and the Administrator to make specific trips over the route.

(d) An air carrier inspector of the Administrator must be admitted to the pilot compartment of an air carrier aircraft at any time while performing his official duty.

41.502 Manipulation of controls. No person other than a qualified pilot of the air carrier may manipulate the flight controls of an air carrier aircraft while in scheduled flight, except

that at the discretion of the first pilot such restriction will not apply to other pilots as follows:

(a) authorized air carrier inspectors of the Administrator, or

(b) properly qualified pilot personnel of another air carrier, if the first pilot is at one set of controls.

41.503 Smoking rules. No smoking will be permitted in an aircraft:

(a) while on the ground or water,

(b) during take-offs and landings,

(c) in the berths of sleeper planes, or

(d) elsewhere, unless suitable ash containers are provided.

41.504 Passenger information signs. Aircraft shall be equipped with the following signs so located as to be plainly visible to passengers:

(a) "No smoking" signs located in the cabin and in individual berths,

(b) "Fasten seat belt" signs located in cabin.

(c) "Use oxygen equipment" signs located in the cabins of aircraft not having pressurized cabins when operated at altitudes in excess of 12,000 feet above sea level for any period of time, unless a competent cabin attendant is provided to care for passengers.

41.505 Marking door handles. The latched and unlatched positions of door handles shall be plainly marked.

41.506 Marking emergency exits. Emergency exits shall be clearly marked as such with luminous paint in letters not less than three-fourths of an inch high, such markings to be located either on or immediately adjacent to the pertinent exits and readily visible to passengers. The location and method of operation of the handles shall be marked with luminous paint.

41.507 Use of emergency equipment. The emergency equipment required by § 41.22 must be periodically inspected and tested in accordance with specifications issued by the Administrator. The crew of aircraft used in overwater flights shall be drilled periodically in "abandon ship" procedures. Passengers shall be acquainted with the location of emergency exits, with emergency equipment provided for individual use, and with the procedure to be followed in the case of an emergency landing on the water.

41.508 Route operation proving flights. Before passengers are carried on any new route or any extension of over 100 miles of a route previously authorized, the air carrier shall demonstrate ability to conduct a safe operation by making such flights over the route as the Administrator may require in the interest of safety.

41.509 Aircraft proving tests.

(a) A new make or model of air carrier aircraft shall have at least 100 hours of proving tests under the supervision of an authorized representative of the Administrator before authority for carrying passengers is issued. At least 50 hours of such tests shall be flown over authorized routes and shall include at least 10 hours of night operation.

(b) In a case of major changes on aircraft previously proved, or the use of the same aircraft on a substantially different operation, 50 hours of tests similar to those outlined in the preceding paragraph shall be required, of which at least 25 hours shall be flown over authorized routes.

(c) During the tests specified in paragraphs (a) and (b) no persons shall be carried other than those essential to the tests. Mail, express, and cargo may be carried at the discretion of the Administrator.

41.510 Reports. Each air carrier shall furnish the Administrator the following reports:

(a) A monthly operations report shall be submitted on and in accordance with the form supplied or approved by the Administrator for the purpose not later than the 20th day of the next succeeding month.

(b) A mechanical interruption report shall be submitted on the form supplied for the purpose not later than 10 days after the return of the aircraft to its operating base. Any partial or complete instrument or equipment mechanical failure which occurs during flight shall be reported. The records of such mechanical failure must be made available to any authorized representative of the Administrator or Board on request.

41.511 Irregularity report. All airmen, including flight and ground personnel, shall immediately report to the operations manager any irregularity or hazard which in their opinion makes for unsafe operation. If such report is found to be justified, notice of the irregularity or hazard must be submitted to the Administrator at once.

41.512 Communication priority. Where a communications channel serves point-to-point contacts in addition to ground-to-plane, priority shall be given to plane-to-ground and ground-to-plane communications.

41.513 Flight records. The air carrier shall maintain and make available to any authorized representative of the Administrator or Board, for not less than one year from the date of flight, the records pertaining to any flight which was interrupted because of weather conditions and failed to land at the point to which it was originally cleared. Such records shall include the flight plan, flight log, clearance, and any other data necessary to complete the record of the operation.

CARGO OPERATION RULES

41.6–41.9 (In preparation.)

41.99 Definitions.

(a) **Route.** A route is a path through the navigable airspace identified by an area on the surface of the earth, the boundaries of which are designated or approved by the Administrator.

(b) **Short distance operation.** A short distance operation is one which involves intermediate stops of sufficient frequency to permit the dispatch from each such stop to be based on spot weather reports or a combination of spot weather reports and forecasts.

(c) **Long distance operation.** A long distance operation is one in which the time interval between stops is of sufficient duration to require that the dispatch be based entirely on forecasts of weather expected at the intended destination and alternates.

(d) **Regular airport.** A regular airport is an airport used as a regular stop on a route.

(e) **Provisional airport.** A provisional airport is an airport approved for the purpose of providing adequate service to a community when the regular airport serving that community is not available.

(f) **Alternate airport.** An alternate airport is one listed in the clearance as a point to which a flight may be directed if, subsequent to departure, a landing at the point to which the flight is cleared becomes undesirable.

(g) **Refueling and holding airport.** A refueling and holding airport is an airport approved as a point to which flights may be cleared for refueling.

(h) **Check pilot.** A check pilot is a pilot authorized by the Administrator to check pilots of the air carrier for familiarity with route procedures and for piloting technique.

(i) **Flight crew member.** The term "flight crew member" means a pilot, flight radio operator, flight engineer, or flight navigator assigned to duty on the aircraft.

(j) **Crew member.** The term "crew member" means any company employee assigned to duty on the aircraft.

(k) **Contact operation.** A contact operation is an operation conducted under contact flight rules as prescribed in Part 60.

(l) **Instrument operation.** An instrument operation is an operation conducted under instrument flight rules as prescribed in Part 60.

(m) **Point-of-no-return.** The term "point-of-no-return" means that point at which the aircraft no longer has sufficient fuel, under existing conditions, to return to the point of departure or any alternate for that point.

(n) **Pilot compartment.** The term "pilot compartment" means that part of the aircraft designed for the use of the flight crew.

(o) **Ceiling.** The term "ceiling," as used in this Part, means the height of the base of the lowest cloud layer reported as "broken clouds" or "overcast."

(p) **Broken clouds.** The term "broken clouds" means a condition where more than 50 but less than 90 percent of the sky is covered by clouds.

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ceilings and visibilities along the route to be flown are, and will remain, at or above the minimums required for flight under contact flight rules until the flight arrives at the next point of intended landing specified in the clearance.

41.4031 Instrument or over-the-top dispatch, short distance operation. Aircraft may be dispatched only if the observed weather information and current weather forecasts pertaining to the next point of intended landing specified in the clearance show a trend indicating that the ceiling and visibility will be at or above the minimums specified when the flight is scheduled to arrive; and at least one alternate airport, meeting the minimum weather requirements for the airport when used as an alternate, is designated in the clearance.

41.4032 Dispatch, long distance operation. Aircraft may be dispatched only in compliance with the following conditions:

(**a**) The current weather forecasts must indicate that the ceiling and visibility either at the next point of intended landing or at any required alternate therefor will be at or above the approved minimums at the time the flight is estimated to arrive.

(**b**) In the case of overwater flights or any other flight where the point of intended landing has no available alternate, the current weather forecasts must also indicate that the ceiling and visibility either at the point of departure or at any required alternate therefor will be above the approved minimums at the time of arrival back to such point from any point along the route closer than the point-of-no-return.

41.404 Icing conditions. Aircraft shall not be dispatched or flown into known heavy icing conditions and may be dispatched or flown into any less serious icing condition only if the aircraft is equipped for deicing wings, propellers, and such other parts of the aircraft as are essential to safety.

41.405 Fuel supply.

(**a**) **Short distance contact operation.** An aircraft may be dispatched or take off only if it carries sufficient fuel, considering the wind and other weather conditions expected, to fly to the next point of landing specified in the clearance and thereafter for a period of at least 45 minutes at normal cruising consumption.

(**b**) **Short distance instrument or over-the-top operation.** An aircraft may be dispatched or take off only if it carries sufficient fuel, considering the wind and other weather conditions expected, to fly to the next point of landing specified in the clearance; and thereafter (1) to fly to and land at the most distant alternate airport designated for that point in the clearance; and thereafter (2) to fly for a period of at least 45 minutes at normal cruising consumption.

(**c**) **Long distance operation.** An aircraft may be dispatched or take off only if it carries sufficient fuel, considering the wind and other weather conditions expected, to fly to the next point of landing specified in the clearance; and thereafter (1) to fly to and land at the most distant alternate airport designated for that point in the clearance; and thereafter (2) to fly for a period of at least 2 hours at normal cruising consumption. An aircraft may be redispatched to return to the point of departure or to an alternate airport for that point only when such redispatch is accomplished while the aircraft has sufficient fuel to return to such point and thereafter to fly for a period of at least 2 hours at normal cruising consumption. In the case of a route approved without an available alternate for a particular stop, an aircraft dispatched to that point must carry sufficient fuel, considering wind and other weather conditions expected, to fly to that point and thereafter for at least 3 hours at normal cruising consumption. The Administrator may require fuel in excess of any of the minimums specified in this paragraph when he finds that additional fuel is necessary on a particular route in the interest of safety and, in the case of an overland operation, where adequate intermediate airports and navigational facilities are available, may permit the operation to be conducted with the fuel reserves specified in paragraph (b).

41.406 Maintenance release, clearance, and load manifest forms. All maintenance release, clearance, and load manifest forms used shall be approved by the Administrator. The original copies of such forms shall be given to the first pilot and duplicate copies kept in the station file for at least 90 days.

41.4060 Preparation of maintenance release form. A maintenance release form shall be prepared for each aircraft delivered by the maintenance department to the operations department. This form must be signed by personnel of the air carrier charged with the duty of supervising the maintenance of the aircraft.

41.4061 Preparation of clearance form. A clearance form shall be prepared for each flight between specified clearance points. The information for such clearance shall be prepared by the authorized aircraft dispatcher of the air carrier operating the aircraft. This

form shall be signed by the first pilot and by the authorized aircraft dispatcher only when both believe the flight may be made with safety. The authority to sign such clearance may be delegated for a particular flight by the authorized aircraft dispatcher, but the authority to dispatch cannot be delegated, and such dispatcher remains responsible for the dispatch and continued supervision of the flight.

41.4062 Preparation of load manifest form. A load manifest form showing the loading of the aircraft 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 aircraft and the preparation of the load manifest forms, or by qualified persons authorized by the air carrier. The aircraft when loaded shall not exceed the center of gravity limits or maximum allowable weight limits set forth in the aircraft certificate for the particular aircraft.

41.407 Traffic conditions. Immediately prior to departure it is the responsibility of the dispatcher, dispatching an instrument flight outside of an airway traffic control area, to ascertain from the best available information what other flights affecting the proposed flight are in progress over the route and to report this information to the first pilot.

41.408 Dispatcher emergency procedure. In the event of inability to maintain two-way communication with the aircraft while it is in flight the dispatcher is responsible for notifying all other known traffic in the area of such failure, giving the last approved flight plan and the expected time of arrival at the destination.

41.409 Redispatch from alternate airports. Aircraft may be redispatched from any alternate airport. In the case of an off-route alternate, the return to the authorized route must be made in accordance with conditions specified by the Administrator.

41.41 Flight preparation and take-off rules.

41.410 Tests and checks. Before departure the first pilot is responsible for the testing or checking of each item in the check list approved by the Administrator, at the time and to the extent specified.

41.411 View of traffic. The pilot shall maneuver the aircraft to a position from which incoming and outgoing aircraft can be observed until immediately prior to take-off.

41.42 Flight course and en route rules.

41.420 Continuance of flight, short distance operation. No flight shall be continued toward any point to which it is cleared unless the weather conditions at alternate airports specified in the clearance remain at or above the minimums specified for each such airport when used as an alternate.

41.421 Change in clearance en route. The clearance may be amended en route by the substitution of another alternate airport within the fuel range of the aircraft, as outlined in § 41.405 (b), where weather conditions are at or above the minimums for such airport when used as an alternate. If change in clearance is made while an aircraft is in flight, the two-way conversation shall be entered in the ground station radio log. After clearance for contact flight no aircraft shall be recleared en route for instrument flight, unless all instruments and items of equipment required by § 41.25 for the type of operation are in serviceable condition.

41.422 Deviation from route. No aircraft may deviate from the route over which it is dispatched except when circumstances render such deviation necessary as a safety measure. Any deviation from the route must be explained by the pilot in a written report dispatched to the Administrator within 7 days after return to his base.

41.423 Reporting unusual conditions. When an icing or other unusual meteorological condition is encountered in flight the pilot shall notify his company radio ground station as soon as practicable and such information shall be relayed to all flights which may be affected.

41.424 Flight altitude rules.

41.4240 Day contact operation. Except during take-offs and landings, no aircraft shall be flown at an altitude less than 500 feet above the ground or water, or within 500 feet of any mountain, hill, or other obstruction to flight, except in such cases as may be specifically approved.

41.4241 Night and instrument operation. Except during take-offs and landings or when operating in accordance with specific procedures for definite localities approved by the Administrator, no aircraft shall be flown at an altitude of less than 1,000 feet above the highest obstacle located within a horizontal distance of 5 miles from the center of the course intended to be flown.

41.425 Communication failure. In the event of inability to maintain two-way radio communication, the pilot in command shall observe one of the following procedures in the order listed:

(a) proceed according to current flight plan, maintaining the minimum instrument altitude or the last acknowledged assigned altitude, whichever is higher, to the airport of