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Civil Aeronautics Manual 41

Certification and Operation Rules for Scheduled Air Carrier Operations Outside the Continental Limits of the United States

Supplement No. 1, CAM 41 dated Nov. 10, 1959 — June 15, 1960

SUBJECT: Revisions to CAM 41.

This supplement is issued to incorporate in CAM 41 Civil Air Regulations Amendments and Special Civil Air Regulations SR–425B, SR–436 and SR–440 issued since the manual was last printed. Amendments 41–29 through 41–32 have been incorporated in the revised pages transmitted with this supplement. Amendment 41–33 is incorporated in Amendment 41–28 which, except as provided in section 41.53h, does not become effective until January 1, 1961. Therefore, Amendment 41–28 is attached as appendix B.

With the discontinuance of the distribution of individual amendments to the Civil Air Regulations, it is believed that the preamble material contained in the amendments should be reproduced in the manuals. Therefore, we are preparing the preambles of amendments to CAR Part 41 beginning with Amendment 41–1 adopted May 9, 1955, as an addendum to CAM 41. In addition to the preamble, the date of adoption, the effective date, Federal Register citation, and the sections affected will be given for each amendment. It is anticipated that this will be issued as a Supplement to CAM 41 in the near future.

New or revised material is enclosed in black brackets on the pages submitted with this supplement. However, because Special Civil Air Regulations SR–425B, SR–436, and SR–440 in Appendix A and Amendment 41–28 in Appendix B are new in their entirety, they are not so marked.

Remove the following pages:	*Insert the following new pages:*
VII and VIII	VII and VIII
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41 and 42	41 through 42–1
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000 feet, sufficient oxygen shall be provided for 10 percent of the number of passengers for the duration of flight between such cabin pressure altitudes. When the cabin pressure altitude is above 14,000 feet to and including 15,000 feet, sufficient oxygen shall be provided for 30 percent of the number of passengers for the duration of flight between such cabin pressure altitudes. When the cabin pressure altitude is above 15,000 feet, sufficient oxygen shall be provided for each passenger for the duration of flight above such a cabin pressure altitude. In addition to the above supply of oxygen, in order to provide for loss of cabin pressure, the supplementary oxygen required by whatever portions of section 41.24a(b) are applicable, shall be provided except that in no case will it be necessary to furnish a supply of oxygen in excess of that necessary to supply oxygen to 100 percent of the passengers for the maximum possible duration of flight at the maximum cabin altitude which could be attained under either of the normal operating or emergency conditions whichever is greater.

(Published in 19 F.R. 547, February 2, 1954, effective February 15, 1954.)

41.24a–3 *Oxygen requirements for clinical purposes (FAA policies which apply to sec. 41.24a(b)).* The regulations do not require that oxygen be provided for clinical purposes; hence, if the air carrier believes that such oxygen is to be desired, he should provide oxygen for this purpose. It is suggested that portable units of any size the air carrier desires be used for this purpose in order that the minimum supply required for supplementary breathing purposes will be preserved. If, however, the operator wishes to use a common source of supply for the oxygen required by the regulations and for clinical purposes, he may do so if he provides an amount of oxygen sufficiently greater than that required by the regulations. It is suggested that a quantity of 300 liters may be considered as satisfying reasonable needs.

(Published in 19 F.R. 547, February 2, 1954, effective February 15, 1954.)

41.24a–4 *Oxygen requirements for infants-in-arms (FAA policies which apply to sec. 41.24a(b)).* Provisions should be made for administering oxygen to infants-in-arms, and additional oxygen over that required by section 41.24a(b) should be carried whenever an unusually large number of infants is carried. This additional oxygen is needed only when there is a passenger or infant for each seat position and the number of infants not provided for exceeds 50 percent of the seat positions. Acceptable methods of administering the oxygen to infants and now used by many operators are: (a) A disposable plastic mask which can be fitted to the face; (b) an infant size BLB oronasal mask and (c) semirigid paper cups, specifically reserved for the purpose, which can be fitted over the infant's nose and mouth, with a hole punched through the bottom through which an oxygen tube or Y-connector can be inserted. Any other acceptable method may also be used.

(Published in 19 F.R. 547, February 2, 1954, effective February 15, 1954.)

41.24a–T *Supplemental oxygen for emergency descent and for first aid; turbine-powered airplanes with pressurized cabins.*

(a) *General.* Prior to November 30, 1959, turbine-powered airplanes with pressurized cabins shall comply with the provisions of section 41.24a, with the additional requirement that, when operating at flight altitudes above 25,000 feet, all flight crew members on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be immediately available for use; or, alternatively, with the provisions of this section except that effective November 30, 1959, all such turbine-powered airplanes shall comply with the provisions of this section. When operating pressurized cabin airplanes, the air carrier shall furnish oxygen and dispensing equipment necessary to permit compliance with the requirements set forth in this section in the event of cabin pressurization failure.

(b) *Crew members.* When operating at flight altitudes above 10,000 feet, oxygen shall be provided to permit compliance with section 41.24–T except that not less than a 2-hour supply shall be provided for the flight crew members on flight deck duty. The oxygen required by section 41.24c 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.

[(Amendment 41–30, published in 24 F.R. 9840, Dec. 8, 1959, effective Nov. 30, 1959. Superseded by Amendment 41–32, published in 25 F.R. 798, Jan. 30, 1960, effective Feb. 1, 1960.)]

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

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

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

(2) When an airplane is operated at flight altitudes to and including 25,000 feet and cannot descend safely to a flight altitude of 14,000 feet within 4 minutes, or when an airplane is operated at flight altitudes above 25,000 feet, oxygen shall be available at the rate prescribed by this part for not less than 10 percent of the number of passenger cabin occupants carried for the duration of flight following cabin depressurization at cabin pressure altitudes above 10,000 feet to and including 14,000 feet and, as applicable, to permit compliance with section 41.24–T (b) (2) and (3), except that not less than a 10-minute supply for all passenger cabin occupants shall be provided.

(3) For first-aid treatment of occupants who for physiological reasons might require undiluted oxygen following descent from cabin pressure altitudes above 25,000 feet, a supply of oxygen in accordance with the requirements of section 4b.651(b)(4) (see section 41.24b) shall be provided for 2 percent of the occupants for the duration of flight following cabin depressurization at cabin pressure altitudes above 8,000 feet, but in no case to less than one person. An appropriate number of acceptable dispensing units, but in no case less than 2, shall be provided. Means shall be provided to enable the cabin attendants to use this supply.

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

41.24b *Equipment standards.*

(a) *Reciprocating-engine-powered airplanes.* The oxygen apparatus, the minimum rates of oxygen flow, and the supply of oxygen necessary to comply with the requirements of section 41.24 shall meet the standards established in section 4b.651 of this sub-

chapter effective July 20, 1950: *Provided*, That where full compliance with such standards is found by the Administrator to be impracticable, he may authorize such changes in these standards as he finds will provide an equivalent level of safety.

(b) *Turbine-powered airplanes.* Prior to November 30, 1959, turbine-powered airplanes shall comply with the provisions of paragraph (a) of this section or, alternatively, with the provisions of this paragraph except that effective November

41.45 ***Airspeed indicators, limitations, and related information.***

(a) 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.

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

(c) 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.

(d) 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.

41.45–1 *Airspeed limitations and related information contained in the Airplane Flight Manual (FAA policies which apply to sec. 41.45(d)).* The airspeeds shown in the Performance Information Section only, of an Airplane Flight Manual approved prior to April 1, 1956, may continue to be expressed in statute miles per hour, provided that a table converting statute miles to knots is incorporated therein, and a cautionary note is placed on each page and chart where airspeeds are denoted indicating that the statute miles shown must be converted to knots when determining performance information. A similar note should be placed in the Operations Limitations Section, indicating that airspeeds shown in the Performance Information Section are in statute miles and must be converted to knots when determining performance information.

(Published in 21 F.R. 4312, June 20, 1956, effective July 1, 1956.)

Airman Rules

Pilot

41.48 *Certificate.*

(a) Any pilot serving as pilot in command 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 in command 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 in command in an aircraft requiring three or more pilots shall meet the requirements of paragraph (a) of this section.

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

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

[(Amendment 41–29, published in 24 F.R. 9772, Dec. 5, 1959, effective Mar. 15, 1960.)]

41.49 ***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.**

41.49–1 *Crew complement; number of pilots required (FAA rules which apply to secs. 41.49 and 41.65).* The number of pilots required on aircraft certificated in accordance with T-category requirements shall not be less than the pilot personnel specified in the minimum crew as set forth in the airplane flight manual of the particular aircraft. In the case of aircraft certificated in accordance with non T-category requirements, not less than two pilots shall be required when (a) the aircraft incorporates multiengine features combined with retractable landing gear or wing flaps, or (b) in the conduct

of a flight, the duties of a pilot serving as pilot in command would be unduly interfered with through the necessity of performing other duties usually performed by the second in command.

(Published in 15 F.R. 9232, December 23, 1950, effective upon publication; amended in 18 F.R. 6753, October 24, 1953, effective December 1, 1953.)

41.50 *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 the provisions 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 such 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. Such entry shall include a landing and take-off. The qualifying pilot shall occupy a seat in the pilot compartment and he shall be accompanied by a pilot who is qualified at the airport.

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

(1) The initial entry is made under VFR weather conditions at the particular airport involved; or

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

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

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

41.51 *Maintenance and re-establishment of pilot route and airport qualification 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 section 41.50(e), if applicable.

(b) In order to re-establish 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 section 41.50.

41.52 *Initial pilot flight training and recent experience.*

(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) No air carrier shall schedule a pilot in command or second in command to serve as such in scheduled air transportation un-

chanical trouble, listed by make and model, and the number of propeller featherings for any reason indicating the flight attitude at the time of feathering, such as takeoff, climb, cruise, etc. A statement of cause is not required with the numerical report of engine removals and propeller featherings.

(3) *Submission.* The period covered by each daily summary shall be for the preceding 24 hours during which reports of pertinent occurrences are received by the air carrier's main base. No daily summary will be submitted for those periods during which no interruptions to schedule were experienced; however, engine removal and propeller feathering data should be included in the next summary submitted. Each summary should be identified numerically to maintain continuity.

(4) *Format.* The daily summary shall include as much as possible of the following data that apply to the individual occurrences reported:

(i) Identification of the daily summary, including a consecutive serial number of the summary, name of operator, and date of occurrence of the items reported.

(ii) Type and FAA identification of aircraft to which each item pertains.

(iii) Brief statement describing or identifying the difficulty experienced. This statement shall identify the parts and system involved and any available related information, where possible, which can reasonably be expected to add to the value of the report from an informative or analytic standpoint. Desirable information would include, where possible, such items as corrective action, extraordinary conditions, whether or not difficulty was induced by personnel error or other extraneous occurrence, and recommendations.

(Published in 18 F. R. 6753, October 24, 1953, effective December 1, 1953.)

41.131 *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.

41.132 *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.

41.133 *Communication records.* Each air carrier shall maintain, and retain for a period of 30 days, records of radio contacts by or with pilots en route.

41.134 *Flight crew members at controls.* 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 en route 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.

**[41.135 *Drinking and serving of alcoholic beverages.*

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

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

[(Amendment 41-31, published in 25 F.R. 169, Jan. 6, 1960, effective Mar. 10, 1960.)]

Definitions

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

***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.**

***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.**

***Category.* Category shall indicate a classification of aircraft such as airplane, helicopter, glider, etc.**

Ceiling. The term "ceiling" means the height of the base of the lowest cloud layer reported as "broken clouds" or "overcast."

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.

Class. Class shall indicate a difference in basic design of aircraft within a category, such as single-engine land, multiengine sea, etc.

Contact operation. A contact operation is an operation conducted under contact flight rules as prescribed in Part 60 of this subchapter.

Crew member. Crew member means any individual assigned by an air carrier for the performance of duty on the aircraft other than as flight crew member during flight time.

Extended overwater operation. An extended overwater operation shall be considered an operation over water conducted at a distance in excess of 50 miles from the nearest shoreline.

Flight crew member. Flight crew member means a pilot, flight radio operator, flight engineer, or flight navigator assigned to duty on the aircraft during flight time.

Flight time. Flight time shall mean the total time from the moment the aircraft first moves under its own power for the purpose of flight until the moment it comes to rest at the end of the flight (block to block).

Instrument operation. An instrument operation is an operation conducted under instrument flight rules as prescribed in Part 60 of this subchapter.

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.

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

Pilot in command. Pilot in command shall mean the pilot responsible for the operation and safety of the aircraft during the time defined as flight time.

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.

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.

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

Regular airport. A regular airport is an airport used as a regular stop on a route.

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.

Route segment. A route segment is a portion of a route, the boundaries of which are identified by:

(1) A continental or insular geographic location;

(2) A point at which some specialized aid to air navigation is located; or

(3) A point at which a definite radio fix is located.

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

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.

Type. Type shall mean all aircraft of the same basic design including all modifications thereto except those modifications which result in a change in handling or flight characteristics.

41.137–1 *Definitions; route segment (FAA interpretations which apply to sec. 41.137(q)).* The term "continental or insular geographic location" is a means for identifying a route segment where navigation can be accomplished by visual reference for the conduct of (a) day

VFR operations, and (b) night VFR operations provided the geographic landmarks afford adequate visual reference during the hours of darkness.

The terms "a point at which some specialized aid to air navigation is located" and "a point at which a definite radio fix is located" are means for identifying a route segment where adequate navigational aids are available for day or night IFR operations.

(Published in 15 F. R. 9232, December 23, 1950, effective upon publication in the Federal Register.)

SPECIAL CIVIL AIR REGULATION NO. SR–425B

Effective: April 7, 1960
Adopted: April 7, 1960

Provisional Certification and Operation of Aircraft

Special Civil Air Regulation No. SR–425A was adopted on July 22, 1958, to provide for provisional certification of turbine-powered transport category airplanes in order to permit certain air carriers and manufacturers to conduct crew training, service testing, and simulated air carrier operations prior to introduction of the airplanes into commercial service. The objective of this regulation was to provide a means whereby the air carriers and manufacturers could obtain as much experience as possible with turbine-powered airplanes which, although safe for flight, had not been approved for the issuance of a type certificate.

Pursuant to the notice of proposed rule making contained in Draft Release 58–23 (24 F.R. 25), notice was given that SR–425A would be amended to extend the application of that regulation to piston as well as turbine-powered transport category aircraft including rotorcraft. The notice also provided that SR–425A would be amended to include personal and executive type aircraft and would permit additional operations such as sales demonstrations and market surveys with aircraft having a provisional type and airworthiness certificate. In substance this proposal provided for the issuance of two classes of provisional type and airworthiness certificates and for amendments to the provisional type certificates. Class I provisional type and airworthiness certificates would be issued for all types of aircraft—turbine or piston—for operation by the manufacturer. Class II provisional type and airworthiness certificates would be limited to transport category aircraft—turbine or piston—but these aircraft could be operated by either the manufacturer or a certificated air carrier. However, the requirements for the issuance of the Class II provisional certificates would be more stringent and the operating limitations would be more confining than those of the Class I provisional certificates.

Comments received from all segments of the aircraft manufacturing and air carrier industries were generally favorable to the basic aim of the regulation. A number of suggestions were made to expand the applicability of the regulation and to eliminate certain of the requirements in the proposal. Certain of the comments expressed the opinion that Class I provisional certificate requirements are unnecessary and that the operations permitted thereunder should be permitted under the authority of an experimental certificate. However, the Agency believes that public safety considerations require that the type of operations permitted under this regulation be conducted in aircraft, the airworthiness of which has been demonstrated beyond that required for experimentally certificated aircraft. In addition, comments received from engine manufacturers suggested that this regulation should permit such manufacturers as well as

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aircraft manufacturers to obtain provisional type certificates and operate aircraft under the terms of provisional certificates. This suggestion has been given careful consideration, but the Agency does not feel that it is in a position, at this time, to permit such a substantive change in the provisions of the draft release.

While the basic provisions of the regulation being adopted are substantially the same as those contained in the draft release, some of the changes suggested by the industry have been incorporated into this regulation. For example, the regulation has been expanded to permit helicopters certificated under Class II provisional certificates to be operated by scheduled helicopter air carriers. It further provides that flight time accumulated by a prototype aircraft under the auspices of a United States military service may be counted toward the requirements for a provisional type certificate. In this connection, certain manufacturers of Part 3 airplanes have suggested that the provision requiring a prototype airplane to be flown for at least 50 hours should be reduced to 5 hours. In view of the fact that such time may now be acquired under the auspices of a United States military service as well as under the authority of an experimental certificate, the 50 hours of required flight time will not impose any unnecessary burden upon the manufacturers of Part 3 airplanes.

In addition to the foregoing, the draft release proposed that provisional type certificates would remain in effect for an indefinite period of time unless sooner superseded, revoked, or otherwise terminated by the Administrator. Further analysis indicates that this feature of the proposal would permit the existence for an indefinite period of time of two certificates, type and provisional type, for substantially the same type design aircraft. To preclude such dual type certification, this regulation provides for the expiration of a Class I provisional type certificate 24 months after its issuance or upon the issuance of the corresponding type certificate, whichever occurs first. The regulation provides for the expiration of the Class II provisional type certificate 6 months after its issuance or 60 days after the issuance of the corresponding type certificate, whichever occurs first. Thereafter, manufacturers desiring to make changes to the approved type design may apply for an amendment to the type certificate and, pending approval of the amendment, to obtain a provisional amendment for such changes which would be in effect for 6 months, or until the amendment to the type certificate is approved, whichever occurs first. Aircraft conforming to the provisionally amended type certificate would then be issued provisional airworthiness certificates.

Certain other minor changes of a clarifying nature have also been made after consideration of the comments received. Not all of the suggested changes obtained in the comments on Draft Release No. 58–23 are included in this amendment because they would necessitate an unwarranted delay in its adoption by requiring additional rule making procedures. The Agency has under study amendments to the airworthiness classifications which will take into consideration the various suggestions submitted.

Interested persons have been given an opportunity to participate in the making of this regulation, and due consideration has been given to all relevant matters presented. Since this regulation relaxes a present restriction, it may be made effective on less than 30 days' notice.

In consideration of the foregoing, the following Special Civil Air Regulation, No. SR–425B, is adopted to become effective April 7, 1960:

GENERAL

1. *Applicability.* Contrary provisions of the Civil Air Regulations notwithstanding, provisional type and airworthiness certificates, amendments to provisional type certificates, and provisional amendments to type certificates, will be issued as prescribed in this regulation to a manufacturer or an air carrier. As used in this regulation, a manufacturer shall mean only a manufacturer who is a citizen of the United States; and the term air carrier shall not include an air taxi operator.

2. *Eligibility.*

(a) A manufacturer of aircraft manufactured by him within the United States may apply for Class I or Class II provisional type and provisional airworthiness certificates, for amendments to provisional type certificates held by him, and for provisional amendments to type certificates held by him.

(b) An air carrier holding an air carrier operating certificate authorizing him to conduct operations under Parts 40, 41, 42, or 46 of the Civil Air Regulations may apply for Class II provisional airworthiness certificates for transport category aircraft which meet the conditions of either subparagraphs (1) or (2) of this paragraph.

(1) The aircraft has a currently valid Class II provisional type certificate or an amendment thereto;

(2) The aircraft has a currently valid provisional amendment to a type certificate which was preceded by a corresponding Class II provisional type certificate.

3. *Application—*

(a) *General.* Applications for provisional type and airworthiness certificates, for amendments to provisional type certificates, and for provisional amendments to type certificates, shall be submitted to the Chief, Flight Standards Division, FAA, of the Regional Office in which the manufacturer or air carrier is located and shall be accompanied by the pertinent information specified in this regulation.

4. *Duration.* Unless sooner surrendered, superseded, revoked, or otherwise terminated, certificates and amendments thereto, shall have periods of duration in accordance with paragraphs (a) through (f) of this section.

(a) A Class I provisional type certificate shall remain in effect for 24 months after the date of its issuance or until the date of issuance of the corresponding type ceritficate, whichever occurs first.

(b) A Class I provisional type certificate shall expire immediately upon issuance of a Class II provisional type certificate for aircraft of the same type design.

(c) A Class II provisional type certificate shall remain in effect for 6 months after the date of its issuance or 60 days after the date of issuance of the corresponding type certificate, whichever occurs first.

(d) An amendment to a Class I or a Class II provisional type certificate shall remain in effect for the duration of the corresponding provisional type certificate.

(e) A provisional amendment to a type certificate shall remain in effect for 6 months after its approval or until the amendment to the type certificate is approved, whichever occurs first.

(f) Provisional airworthiness certificates shall remain in effect for the duration of the corresponding provisional type certificate, amendment to a provisional type certificate, or a provisional amendment to the type certificate.

5. *Transferability of certificates.* Certificates issued pursuant to this regulation are not transferable except that a Class II provisional airworthiness certificate may be transferred to an air carrier eligible to apply for such certificate under section 2 of this regulation.

6. *Display of certificates and markings.* A provisional airworthiness certificate shall be prominently displayed in the aircraft for which it is issued. The words "Provisional Airworthiness" shall be painted in letters not less than 2 inches high on the exterior of such aircraft adjacent to each entrance to the cabin and cockpit of the aircraft.

REQUIREMENTS FOR ISSUANCE

7. *Class I provisional type certificates.* A Class I provisional type certificate and amendments thereto will be issued for a particular type design when the manufacturer of the aircraft shows compliance with the provisions of paragraphs (a) through (f) of this section, and an authorized representative of the Administrator finds, on the basis of information submitted to him by the manufacturer in compliance with the provisions of this section and of other relevant information, that there is no feature, characteristic, or condition which would render the aircraft unsafe when operated in accordance with the limitations established in paragraph (d) of this section and in section 13 of this regulation.

(a) The manufacturer has applied for the issuance of a type certificate for the aircraft.

(b) The manufacturer certifies that the aircraft has met the provisions of subparagraphs (1) through (3) of this paragraph.

(1) The aircraft has been designed and constructed in accordance with the airworthiness requirements applicable to the issuance of the type certificate for the aircraft;

(2) The aircraft substantially complies with the applicable flight characteristics requirements for the type certificate;

(3) The aircraft can be operated safely under the appropriate operating limitations specified in this regulation.

(c) The manufacturer has submitted a report showing that the aircraft had been flown in all maneuvers necessary to show compliance with the flight requirements for the issuance of the type certificate and to establish that the aircraft can be operated safely in accordance with the limitations specified in this regulation.

(d) The manufacturer has established limitations with respect to weights, speeds, flight maneuvers, loading, operation of controls and equipment, and all other relevant factors. The limitations shall include all the limitations required for the issuance of a type certificate for the aircraft: *Provided,* That, where such limitations have not been established,

appropriate restrictions on the operation of the aircraft shall be established.

(e) The manufacturer has established an inspection and maintenance program for the continued airworthiness of the aircraft.

(f) A prototype aircraft has been flown by the manufacturer for at least 50 hours pursuant to the authority of an experimental certificate issued under Part 1 of the Civil Air Regulations or under the auspices of a United States military service: *Provided,* That the number of flight hours may be reduced by the authorized representative of the Administrator in the case of an amendment to a provisional type certificate.

8. *Class I provisional airworthiness certificates.* Except as provided in section 12 of this regulation, a Class I provisional airworthiness certificate will be issued for an aircraft, for which a Class I provisional type certificate is in effect, when the manufacturer of the aircraft shows compliance with the provisions of paragraphs (a) through (d) of this section, and an authorized representative of the Administrator finds that there is no feature, characteristic, or condition of the aircraft which would render the aircraft unsafe when operated in accordance with the limitations established in sections 7(d) and 13 of this regulation.

(a) The manufacturer is the holder of the provisional type certificate for the aircraft.

(b) The manufacturer submits a statement that the aircraft conforms to the type design corresponding with the provisional type certificate and has been found by him to be in safe operating condition under the applicable limitations.

(c) The aircraft has been flown at least 5 hours by the manufacturer.

(d) The aircraft has been supplied with a provisional aircraft flight manual or other document and appropriate placards containing the limitations required by sections 7(d) and 13 of this regulation.

9. *Class II provisional type certificates.* A Class II provisional type certificate and amendments thereto will be issued for a particular transport category type design when the manufacturer of the aircraft shows compliance with the provisions of paragraphs (a) through (h) of this section, and an authorized representative of the Administrator finds, on the basis of information submitted to him by the manufacturer in compliance with the provisions of this section and of other relevant information, that there is no feature, characteristic, or condition which would render the aircraft unsafe when operated in accordance with the limitations established in paragraph (f) of this section and in sections 13 and 14 of this regulation.

(a) The manufacturer has applied for the issuance of a transport category type certificate for the aircraft.

(b) The manufacturer holds a type certificate and a currently effective production certificate for at least one other aircraft in the same transport category as the subject aircraft.

(c) The Agency's official flight test program with respect to the issuance of a type certificate for the aircraft is in progress.

(d) The manufacturer certifies that the aircraft has met the provisions of subparagraphs (1) through (3) of this paragraph.

(1) The aircraft has been designed and constructed in accordance with the airworthiness requirements applicable to the issuance of the type certificate for the aircraft;

(2) The aircraft substantially complies with the applicable flight characteristics requirements for the type certificate;

(3) The aircraft can be operated safely under the appropriate operating limitations specified in this regulation.

(e) The manufacturer has submitted a report showing that the aircraft had been flown in all maneuvers necessary to show compliance with the flight requirements for the issuance of the type certificate and to establish that the aircraft can be operated safely in accordance with the limitations specified in this regulation.

(f) The manufacturer has prepared a provisional aircraft flight manual which includes limitations with respect to weights, speeds, flight maneuvers, loading, operation of controls and equipment, and all other relevant factors. The limitations shall include all the limitations required for the issuance of a type certificate for the aircraft: *Provided,* That, where such limitations have not been established, the provisional flight manual shall contain appropriate restrictions on the operation of the aircraft.

(g) The manufacturer has established an inspection and maintenance program for the continued airworthiness of the aircraft.

(h) A prototype aircraft has been flown by the manufacturer for at least 100 hours pursuant to the authority of either an experimental certificate issued under Part 1 of the Civil Air Regulations or a Class I provisional airworthiness certificate: *Provided,* That the number of flight hours may be reduced by the authorized representative of the Administrator in the case of an amendment to a provisional type certificate.

10. *Class II provisional airworthiness certificates.* Except as provided in section 12 of this regulation, a Class II provisional airworthiness certificate will be issued for an aircraft, for which a Class II provisional type certificate is in effect, when the applicant shows compliance with the provisions of paragraphs (a) through (e) of this section, and an authorized representative of the Administrator finds that there is no feature, characteristic, or condition of the aircraft which would render the aircraft unsafe when operated in accordance with the limitations established in section 9(f), 13, and 14 of this regulation.

(a) The applicant submits evidence that a Class II provisional type certificate for the aircraft has been issued to the manufacturer.

(b) The applicant submits a statement by the manufacturer that the aircraft has been manufactured under a quality control system adequate to ensure that the aircraft conforms to the type design corresponding with the provisional type certificate.

(c) The applicant submits a statement that the aircraft has been found by him to be in a safe operating condition under the applicable limitations.

(d) The applicant submits a statement that the aircraft has been flown at least 5 hours by the manufacturer.

(e) The aircraft has been supplied with a provisional aircraft flight manual containing the limitations required by sections 9(f), 13, and 14 of this regulation.

11. *Provisional amendments to type certificate.* A provisional amendment to a type certificate will be approved when the manufacturer of the type certificated aircraft shows compliance with the provisions of paragraphs (a) through (g) of this section, and an authorized representative of the Administrator finds, on the basis of information submitted to him by the manufacturer in compliance with the provisions of this section and of other relevant information, that there is no feature, characteristic, or condition which would render the aircraft unsafe when operated in accordance with the limitations established in paragraph (e) of this section, and section 13 and, if applicable, section 14 of this regulation.

(a) The manufacturer has applied for an amendment to the type certificate.

(b) The Agency's official flight test program with respect to the amendment of the type certificate is in progress.

(c) The manufacturer certifies that the aircraft has met the provisions of subparagraphs (1) through (3) of this paragraph.

(1) The modification involved in the amendment to the type certificate has been designed and constructed in accordance with the airworthiness requirements applicable to the issuance of the type certificate for the aircraft;

(2) The aircraft substantially complies with the applicable flight characteristics requirements for the type certificate;

(3) The aircraft can be operated safely under the appropriate operating limitations specified in this regulation.

(d) The manufacturer has submitted a report showing that the aircraft incorporating the modifications involved had been flown in all maneuvers necessary to show compliance with the flight requirements applicable to these modifications and to establish that the aircraft can be operated safely in accordance with the limitations specified in this regulation.

(e) The manufacturer has established, in a provisional aircraft flight manual or other document and appropriate placards, limitations with respect to weights, speeds, flight maneuvers, loading, operation of controls and equipment, and all other relevant factors. The limitations shall include all the limitations required for the issuance of a type certificate for the aircraft: *Provided,* That where such limitations have not been established, appropriate restrictions on the operation of the aircraft shall be established.

(f) The manufacturer has established an inspection and maintenance program for the continued airworthiness of the aircraft.

(g) An aircraft modified in accordance with the corresponding amendment to the type certificate has been flown by the manufacturer for the number of hours found necessary by the authorized representative of the Administrator, such flights having been conducted pursuant to the authority of an experimental certificate issued under Part 1 of the Civil Air Regulations.

12. *Provisional airworthiness certificates corresponding with provisional amendment to type certificate.* A Class I or a Class II provisional airworthiness certificate, as specified in section 2 of this regulation, will be issued for an aircraft, for which a provisional amendment to the type certificate has been issued, when the applicant shows compliance with the

provisions of paragraphs (a) through (e) of this section, and an authorized representative of the Administrator finds that there is no feature, characteristic, or condition of the aircraft, as modified in accordance with the provisionally amended type certificate, which would render the aircraft unsafe when operated in accordance with the limitations established in sections 11(e) and 13 and, if applicable, section 14 of this regulation.

(a) The applicant submits evidence that approval has been obtained for the relevant provisional amendment to the type certificate for the aircraft.

(b) The applicant submits evidence that the modification to the aircraft was accomplished under a quality control system adequate to ensure that the modification conforms to the provisionally amended type certificate.

(c) The applicant submits a statement that the aircraft has been found by him to be in a safe operating condition under the applicable limitations.

(d) The applicant submits a statement that the aircraft has been flown at least 5 hours by the manufacturer.

(e) The aircraft has been supplied with a provisional aircraft flight manual or other document and appropriate placards containing the limitations required by section 11(e) and 13 and, if applicable, section 14 of this regulation.

OPERATING LIMITATIONS

13. *Operation of provisionally certificated aircraft.* An aircraft for which a provisional airworthiness certificate has been issued shall be operated only by a person eligible to apply for a provisional airworthiness certificate in accordance with section 2 of this regulation. Operations shall be in compliance with paragraphs (a) through (j) of this section.

(a) The aircraft shall not be operated in air transportation unless so authorized in a particular case by the Director, Bureau of Flight Standards.

(b) Operations shall be restricted to the United States, its Territories and possessions.

(c) The aircraft shall be limited to the types of operations listed in subparagraphs (1) through (7) of this paragraph.

(1) Flights conducted by the manufacturer of the aircraft in direct conjunction with the type certification of the aircraft;

(2) Training of flight crews, including simulated air carrier operations;

(3) Demonstration flights conducted by the manufacturer for prospective purchasers;

(4) Market surveys by the manufacturer;

(5) Flight checking of instruments, accessories, and equipment, the functioning of which does not adversely affect the basic airworthiness of the aircraft;

(6) Service testing of the aircraft;

(7) Such additional operations as may be specifically authorized by the authorized representative of the Administrator.

(d) All operations shall be conducted within the prescribed limitations displayed in the aircraft or set forth in the provisional aircraft flight manual or other document containing the limitations for the safe operation of the aircraft: *Provided,* That operations conducted in direct conjunction with the type certification of the aircraft shall be subject to the experimental aircraft limitations of section 1.74 of Part 1 of the Civil Air Regulations, and all "flight tests" as defined in section 60.60 of the Civil Air Regulations shall be conducted in accordance with the requirements of section 60.24 of that part.

(e) The operator shall establish procedures for the use and guidance of flight and ground personnel in the conduct of operations under this section. Specific procedures shall be established for operations from and into airports where the runways require takeoffs or approaches over populated areas. All procedures shall be approved by an authorized representative of the Administrator. All operations shall be conducted in accordance with such approved procedures.

(f) The operator shall ensure that each flight crewmember is properly certificated and possesses adequate knowledge of, and familiarity with, the aircraft and the procedures to be used by him.

(g) The aircraft shall be maintained in accordance with applicable Civil Air Regulations, with the inspection and maintenance program established in accordance with this regulation, and with any special inspections and maintenance conditions prescribed by an authorized representative of the Administrator.

(h) No aircraft shall be operated under authority of a provisional airworthiness certificate if the manufacturer or the authorized representative of the Administrator determines that a change in design, construction, or operation is necessary to ensure safe operation, until such change is made and approved by the authorized representative of the Administrator. Section 1.24 of Part 1 of the Civil Air Regulations shall be applicable to operations under this section.

(i) Only those persons who have a bona fide interest in the operations permitted under this section or who are specifically authorized by both the manufacturer and the authorized representative of the Administrator may be carried in provisionally certificated aircraft: *Provided,* That they have been advised by the operator of the provisional certification status of the aircraft.

(j) The authorized representative of the Administrator may prescribe such additional limitations or procedures as he finds necessary. This shall include limitations on the number of persons who may be carried aboard the aircraft.

14. *Additional limitations to operations by air carriers.* In addition to the limitations in section 13 of this regulation, operations by air carriers shall be subject to the provisions of paragraphs (a) through (d) of this section.

(a) In addition to crewmembers, the aircraft may carry only those persons who are listed in section 40.356(c) of Part 40 of the Civil Air Regulations or who are specifically authorized by both the air carrier and the authorized representative of the Administrator.

(b) The air carrier shall maintain current records for each flight crewmember. These records shall include such information as is necessary to show that each flight crewmember is properly trained and qualified to perform his assigned duties.

(c) The appropriate instructor, supervisor, or check airman shall certify to the proficiency of each flight crewmember and such certification shall become a part of the flight crewmember's record.

(d) A log of all flights conducted under this regulation, and accurate and complete records of inspections made and maintenance accomplished, shall be kept by the air carrier and made available to the manufacturer and to an authorized representative of the Administrator.

15. *Other operations.* The Director, Bureau of Flight Standards, may credit toward the aircraft proving test requirements of the applicable air carrier regulations such operations conducted pursuant to this special regulation as he finds have met the applicable aircraft proving test requirements: *Provided,* That he also finds that there is no significant difference between the provisionally certificated aircraft and the aircraft for which application is made for operation pursuant to an air carrier operating certificate.

CERTIFICATES ISSUED UNDER SR–425A

16. *Duration.* Currently valid provisional type and airworthiness certificates issued in accordance with Special Civil Air Regulation No. SR–425A shall remain in effect for the durations and under the conditions prescribed in that regulation.

This special regulation supersedes Special Civil Air Regulation No. SR–425A and shall terminate on June 30, 1963, unless sooner superseded, rescinded, or otherwise terminated.

SPECIAL CIVIL AIR REGULATION No. SR–436

Effective: February 15, 1960*
Issued: January 7, 1960

Airborne Weather Radar Equipment Requirements
for Airplanes Carrying Passengers

In a notice of rule making published in the Federal Register (24 F.R. 5847) and circulated as Draft Release No. 59–10, dated July 15, 1959, the Federal Aviation Agency proposed to amend Parts 40, 41, and 42 of the Civil Air Regulations to require airborne weather radar to be installed on all aircraft certificated under the transport category rules and carrying passengers. Operationally, it was proposed to require that such radar equipment be in operation for all IFR flights, and for night VFR flights when thunderstorms or severe weather conditions were forecast for the flight plan route during the time of flight.

In commenting upon the draft release, the Air Line Pilots Association was strongly in favor of the proposal and recommended its extension to all large aircraft engaged in air transportation.

Comments from representatives of the scheduled trunkline carriers recognized the desirability of having airborne weather radar on aircraft but opposed the mandatory requirement of such equipment by regulation.

Comments from local service air carriers, or their representatives, were generally opposed to any requirement for radar equipment on airplanes certificated in the nontransport category or for airplanes such as the DC–4 or C–46 certificated in the transport category, which are the type of airplanes being used by such air carriers.

As stated in the draft release, a recent survey of air carrier aircraft accidents for the calendar years 1950 through 1958 has indicated the importance of airborne weather radar as a safety measure in preventing aircraft accidents during certain severe weather conditions. The value of airborne weather radar as an aid to the safety of flight is further supported by the fact that a considerable number of air carrier airplanes are presently equipped with such radar and provisions have been made for the installation of such equipment on practically all new transport-type airplanes. It is considered particularly significant that at least one large air carrier presently has its entire fleet of airplanes fully equipped with airborne weather radar and during a two-year period has not experienced a single passenger or crew injury or any appreciable airplane damage due to thunderstorms or hail. Moreover, the air carrier has completed a high percentage of scheduled trips. As experience has indicated, radar equipment contributes to greater safety in passenger operations, since it facilitates the early detection and location by the pilot of certain areas of severe turbulence and enables him to avoid such areas or to take such other action as may be necessary in the interest of safety.

*Except as otherwise specified in this Special Regulation.

In view of the foregoing, the Administrator has concluded that, in the interest of safety, approved airborne weather radar should be made a required item of equipment at the earliest practicable date for transport category airplanes used in passenger operations under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations, with the exception of Curtiss-Wright C–46 airplanes. The C–46 has been specifically exempted since it was not originally certificated under transport category rules. The notice of proposed rule making did not make this point clear.

The draft release proposed to allow 6 months for the procurement and installation of required radar equipment. However, in consideration of comments received and upon further investigation, the problems associated with the procurement and installation of the airborne radar equipment reasonably appear to require a longer period of time for the industry to comply with this regulation. The airlines have stated that the installation of the airborne radar equipment requires approximately 1,450 hours per airplane and some airplanes may require more time because of necessary modifications. Also, the manufacturers may not be able to furnish the total number of airborne radar units for all airplanes within the proposed six-month period. These problems, together with the problems associated with the scheduling of airplanes for maintenance and overhaul, as well as for the installation of airborne radar equipment, have been considered in establishing the time allowed for the industry to meet this regulation. Upon these considerations the Administrator has determined that except for turbine-powered airplanes, a greater period of time should be allowed for the orderly procurement and installation of required equipment in order to avoid imposing any undue hardship upon operators of airplanes who are subject to this regulation. Accordingly, July 1, 1960, has been established as the date after which approved airborne weather radar will become required equipment for all turbine-powered airplanes used in the carriage of passengers under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations. Since all turbine-powered aircraft subject to this regulation are, with very few exceptions, now equipped or are scheduled to be equipped with airborne weather radar prior to July 1, 1960, it appears that this compliance date will provide an adequate period of time to procure the required equipment and install it in those few remaining turbine-powered aircraft. January 1, 1961, has been established as the compliance date for certain other transport category airplanes specified in section 1(b) and used in passenger operations. Since approximately 80 percent of such airplanes used in passenger operations already have radar equipment installed, it appears that the January 1, 1961, compliance date will provide the operators with an adequate period of time to procure the required equipment and install it in the balance of such airplanes. After Janaury 1, 1962, approved airborne weather radar will be required equipment for the remaining airplanes certificated under the transport category rules, except for Curtiss-Wright C–46 airplanes, and used in passenger operations under Parts 40, 41, or 42 of the Civil Air Regulations.

For the information of the operators, a note has been added to section 1(c) to indicate some of the transport category airplanes in current use which will have to have such equipment by January 1, 1962.

Technical Standard Order C-63, adopted by the Administrator, effective December 1, 1959 (24 F.R. 9262), contains the minimum performance standards for the approval of airborne weather radar equipment required by this regulation. Under the provisions of this Technical Standard Order, airborne weather radar equipment approved prior to the effective date of that order will also be approved for installation under this regulation.

To provide for the accomplishment of an orderly installation of the required airborne weather radar equipment, each operator conducting passenger operations under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations is required by section 2 of this regulation to establish a schedule for the progressive completion of such radar installations on its transport category airplanes on or before the dates specified therein. On or before July 1, 1960, a copy of the schedule required by paragraph (a) of section 2 shall be submitted to an authorized representative of the Administrator, together with a list of any airplanes the operator intends to discontinue using in the carriage of passengers prior to the date on which radar equipment must be installed.

Equipment requirements for dispatch and continuation of flight are described in section 3 of this regulation. Draft Release 59-10 proposed to require the radar equipment to be in operation for all IFR operations, and for night VFR operations when thunderstorms or severe weather conditions were forecast for the flight plan route during the time of flight. However, in the light of comments received, it appears that the original proposal would be unreasonably restrictive. Accordingly, the original proposal has been modified so as to bring the dispatch rule into accord with the capabilities of the radar equipment required to be installed. Thus, the dispatching rule prescribed herein provides that no airplane subject to this regulation shall be dispatched under IFR or night VFR conditions when current weather reports indicate that thunderstorms, or other potentially hazardous weather conditions detectable by airborne weather radar, may reasonably be expected to be encountered along the route to be flown, unless the approved airborne weather radar equipment is in a satisfactory operating condition. Should such equipment become inoperative en route, the airplane must be operated in accordance with the instructions and procedures specified in the operations manual for such occurrence. It should be noted that these dispatch and en route rules will apply after March 31, 1960, to all transport category airplanes subject to this regulation that have approved airborne weather radar equipment installed even though such equipment is not required to be installed until a later date. It should also be noted that approval of the instructions and procedures for the continuation of flight, in the event the radar equipment becomes inoperative en route, will be required at such time as the particular aircraft is required to have approved airborne weather radar equipment installed. In order to permit adequate time for the review of such instructions and procedures the operator should submit them to the assigned air carrier inspector at least 30 days prior to the required approval date. In this regard, the Federal Aviation Agency expects all air carrier aircraft not equipped with airborne weather radar to be operated strictly in accordance with procedures specified in the air carrier's operations manual,

when there is a possibility of encountering potentially hazardous weather conditions.

Section 4 expressly exempts from the provisions of this regulation airplanes used for the carriage of passengers solely within the States of Alaska and Hawaii. These operations have been excluded because thunderstorms and other potentially hazardous meteorological conditions detectable by radar rarely occur in those areas. The language of section 4 also makes it clear that the provisions of this regulation are not intended to be applicable to a transport category airplane during the conduct of a bona fide all-cargo, training, test, or ferry flight.

It will be noted that helicopters have not been made subject to this regulation. Upon further consideration of the original proposal, the Administrator has concluded that the installation of radar equipment is not a necessary safety requirement for helicopters at this time. Finally, attention is directed to the fact that large nontransport category airplanes presently being used in passenger service have been omitted from the list of airplanes subject to this regulation, as for example, C–46, DC–3 and L–18 type airplanes. However, the Federal Aviation Agency will continue to give active consideration to the necessity of requiring approved radar equipment to be installed on such airplanes.

This special regulation is being promulgated in lieu of individual amendments to Parts 40, 41, and 42 of the Civil Air Regulations because such a regulation is considered the most expedient method of implementing the original proposal.

Interested persons have been afforded an opportunity to participate in the making of this regulation (24 F.R. 5847), and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, the Administrator of the Federal Aviation Agency hereby makes and promulgates the following Special Civil Air Regulation:

1. *Airborne weather radar equipment requirement.* After the dates specified, the following transport category airplanes shall not be used for the carriage of passengers under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations, unless approved airborne weather radar equipment is installed in such airplanes:

(a) July 1, 1960, for all turbine-powered airplanes certificated under the transport category rules.

(b) January 1, 1961, for the airplane types listed below:
Douglas DC–7 Series,
Douglas DC–6 Series, and
Lockheed 1049 and 1649 Series.

(c) January 1, 1962, for all airplanes certificated under the transport category rules, except C–46 type airplanes.

NOTE: Airplanes subject to the provisions of paragraph (c) of this section include, but are not limited to, the following types: Boeing 377; Convair 240, 340, and 440; Lockheed 049 and 749; Martin 202 and 404; and Douglas DC–4.

2. *Schedule for installation of equipment.*

(a) Each operator conducting passenger operations under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations with transport category airplanes on which airborne weather radar is not

installed, shall establish a schedule for the progressive completion of such radar installations, in accordance with the provisions of section 1 of this regulation. The schedule shall provide for the completion of all required radar installations on or before the dates specified in section 1 of this regulation, and the completion of at least 40 percent of the required installations on or before the following dates:

(1) August 1, 1960, for airplanes of the types specified in section 1(b), and

(2) February 1, 1961, for airplanes of the types specified in section 1(c).

(b) On or before July 1, 1960, a copy of the schedule required by paragraph (a) of this section shall be submitted to an authorized representative of the Administrator, together with a list of any airplanes the operator intends to discontinue using in the carriage of passengers prior to the date on which radar equipment must be installed.

3. *Requirement for dispatch and continuance of flight.* After March 31, 1960, all transport category airplanes having approved airborne weather radar installed shall be operated in accordance with the following rules when used in passenger operations under Parts 40, 41, or 42:

(a) *Dispatch.* No airplane shall be dispatched (or flight of an airplane started under the provisions of Part 42) under IFR or night VFR conditions when current weather reports indicate thunderstorms, or other potentially hazardous weather conditions which can be detected by airborne weather radar, may reasonably be expected to be encountered along the route to be flown, unless approved airborne weather radar equipment is installed in the airplane and is in a satisfactory operating condition.

(b) *En route.* In the event the airborne weather radar becomes inoperative en route, the airplane shall be operated in accordance with the instructions and procedures specified in the operations manual for such occurrence. After the date specified by section 1 of this regulation for the mandatory installation of approved airborne weather radar on the type of airplane involved, such instructions and procedures shall meet with the approval of an authorized representative of the Administrator.

4. *Exceptions.* The provisions of this regulation shall not apply to those airplanes used solely within the States of Alaska or Hawaii, or during all-cargo, training, test, or ferry flights.

5. *Effective date.* Except as otherwise specified, this regulation shall become effective February 15, 1960.

SPECIAL CIVIL AIR REGULATION NO. SR-440

Effective: June 7, 1960
Adopted: June 7, 1960

Occupancy of Forward Observer's Seat During En Route Inspection

Sections 40.22, 41.5, and 42.8 of the Civil Air Regulations contain provisions which make it mandatory to permit an authorized representative of the Federal Aviation Agency at any time and place to make inspections or examinations to determine an air carrier's compliance with the requirements of the Federal Aviation Act of 1958, and the Civil Air Regulations. Similar inspection provisions have existed without interruption since the regulation of civil aviation by the former Aeronautics Branch, U.S. Department of Commerce, which provided in its regulations that the "owner, operating agency, or pilot" was required to give Federal inspectors "free and uninterrupted access to the aircraft" while conducting government inspections.

Historically, the required Government inspections of air carrier operations known as en route inspections have been conducted from a seat or station on the flight deck of the aircraft which permits the inspector to observe the operation of the aircraft by the flight crew members at their respective stations. This was done for the obvious reason that an inspection conducted from a location which would not permit observation of the operation would be essentially futile. As a result of this well established and accepted practice, it has been unnecessary for the Federal Aviation Agency or its predecessor agencies to further prescribe by regulatory action the authority of the inspector to occupy such seat in the conduct of his required en route inspections.

With the introduction into service of new type turbo jet airplanes two observers' seats were made available for use on the flight deck of such airplanes, in addition to those required for the minimum flight crew. In some of these airplanes one of these seats, the forward observer's seat, is located directly behind that occupied by the pilot in command and permits FAA inspectors while occupying such seat to observe the operation of the airplane by the flight crew members. The location of the second observer's seat, however, does not permit such observation.

By agreement entered into between the Air Line Pilots Association and certain air carriers, an additional pilot flight crew member has been assigned to assist the pilot in command in the operation of turbo jet airplanes. This agreement was entered into notwithstanding the fact that such airplanes were certificated for safe operation by the FAA with a minimum flight crew of two pilots and a flight engineer. Moreover, these airplanes are still being operated safely with such a flight crew complement by all of the other air carriers not parties to such an agreement. The Air Line Pilots Association has now advised the FAA that under the provisions of this agreement it has decided that the forward observer's seat must be occupied by the additional pilot flight crew member or the airplane will not be operated by its members—even during en route inspec-

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tions. In support of this decision, resolutions have been entered into by the Master Executive Council of the pilots of the air carriers which are parties to such agreements directing its members not to operate turbo jet airplanes for en route inspections, when the forward observer's seat is occupied by the FAA inspector instead of the additional third pilot.

Pursuant to such agreements and resolutions, the pilots of one of the air carriers have now refused to operate turbo jet airplanes which were scheduled for en route inspections by authorized representatives of the Administrator occupying the forward observers' seats. Such overt acts by the pilots involved have created a situation which requires immediate corrective action. The statutory safety responsibilities of the Federal Aviation Agency can not be derogated by the provisions of agreements between the pilots and the air carriers, or by unilateral resolutions of the pilots and their associations purporting to implement such agreements. In the exercise and performance of their statutory responsibilities, FAA inspectors conducting en route inspections must be provided with a seat in the cockpit from which they are able properly to discharge such responsibilities. This requirement is both obvious and fundamental for the conduct of inspections which will assure the highest degree of safety in the fast growing system of air transportation.

Because of the emergency nature of the situation, I find that compliance with the notice, procedures and effective date provisions of the Administrative Procedure Act would be impracticable and impede the due and timely execution of the functions of the Federal Aviation Agency.

In consideration of the foregoing this emergency Special Civil Air Regulation is adopted to make clear that the authorized representatives of the Administrator must be given full and uninterrupted access to the aircraft, including a suitable seat on the flight deck, as determined by the Administrator, for the proper performance and discharge of their en route inspection duties. This regulation is declaratory of a longstanding practice and makes explicit, with respect to certain aircraft, the location of such seat.

The following Special Civil Air Regulation is hereby adopted to become effective immediately.

Each air carrier shall make available a seat on the flight deck of each aircraft used by it in air transportation for occupancy by an authorized representative of the Administrator while conducting en route inspections. The location and equipment of such seat, in respect to its suitability for use in conducting en route inspections, shall be as required by the Administrator or his representative. In all Boeing 707's, Douglas DC–8's, and other types of aircraft having more than one observer's seat in excess of that required for the crew complement for which the aircraft was certificated. the forward observer's seat shall be made available to such representative.

Appendix B

CIVIL AIR REGULATIONS AMENDMENT 41-28

Effective: January 1, 1961*
Adopted: December 1, 1959
Published: Dec. 5, 1959
(24 F.R. 9768)

Approval of Air Carrier Training Programs; Qualification of Pilots Other Than Pilots in Command; Proficiency Checks for Pilots Other Than Pilots in Command

The Federal Aviation Agency published as a notice of rule making (24 F.R. 5246) and circulated as Civil Air Regulations Draft Release No. 59-3, dated June 25, 1959, a proposal to amend Part 41 of the Civil Air Regulations to require: (1) Essentially the same training program requirements in Part 41 as are currently contained in Part 40; (2) FAA approval of air carrier training programs; (3) appropriate aircraft ratings for pilots serving as other than pilots in command; and (4) more specific initial training and proficiency checks for pilots serving as other than pilots in command.

Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all relevant matter presented. Because of the importance of this amendment, each portion thereof has been evaluated in the light of such comments.

1. *Training program requirements for Part 41.* Parts 40 and 42 of the Civil Air Regulations currently require each air carrier to establish a training program sufficient to insure that each crew member used by the air carrier is adequately trained and maintains adequate proficiency to perform the duties to which he is assigned. Part 41 of the Civil Air Regulations currently requires periodic instruction to be given all pilots, but does not contain a specific requirement for the establishment of a training program for each crew member.

Accordingly, as proposed in Draft Release 59-3, in the interest of safety and uniformity in air carrier operations, this amendment incorporates into Part 41 training program requirements essentially the same as those contained in Part 40. In adopting the training program requirements prescribed herein, due consideration has also been given to all comments received in response to Civil Aeronautics Board Draft Release No. 58-24 dated December 24, 1958 (24 F.R. 145) which proposed, among other things, training program requirements for Part 41 essentially the same as those now contained in Part 40.

2. *FAA approval of air carrier training programs.* The air carriers

*Except as otherwise provided in section 41.53h.

Note: See section 41.53j(a) for change made by Amendment 41-33.

(Rev. 6/15/60)

commenting on this portion of the proposal expressed strong opposition to it. Briefly, the air carriers contend that the present regulatory scheme for the establishment of methods and procedures for crew member training programs has been adequate and that no justification has been shown for requiring FAA approval of such programs. The Federal Aviation Agency is unable to agree with these contentions.

It must be emphasized that the training program is one of the most important factors in the safety of air carrier operations. The quality and scope of such programs are the key to insuring that all crew members are competent to perform their duties with the high degree of skill expected and required in air carrier operations. Under the provisions of the present regulation, the air carriers are given discretion in establishing "adequate" or "appropriate" training, or "training as necessary." As a result some air carriers have prepared and are administering excellent training programs. However, others have not achieved the minimum safety objective sought by the training requirements of section 41.53. While the methods and procedures employed by the various air carriers in their training programs may differ to fit the particular operation of each air carrier, each training program must provide a uniform and minimum standard of flight and ground training necessary for safety in air transportation. Experience in the administration of the present regulations shows that this standard can only be achieved by FAA approval of each training program.

Accordingly, because of the vital importance which the air carrier training program has to safety in air carrier operations, each air carrier subject to this part will be required to obtain approval of its training program by a representative of the Administrator.

This final regulation will not alter the responsibility which each air carrier has at present for the preparation and administration of its training program. However, each air carrier will be required to submit its training program, and subsequent changes thereto, to the Federal Aviation Agency for prior approval.

3. *Initial training qualifications of pilots other than pilots in command.* The complexity of modern aircraft and the operational demands of today's navigation, communication, and air traffic control systems require a high level of skill and competence for air carrier copilots. Many of the functions which are required of the copilot, particularly with respect to emergency procedures, must be performed properly or the safety of the flight may be seriously affected. In addition, in the event that the pilot in command becomes incapacitated during flight, the copilot must possess adequate knowledge and skill to fly the aircraft safely to a destination.

In order to properly determine the ability of the copilot to operate a particular type of aircraft, it was proposed in Draft Release 59-3 to provide for the issuance of appropriate aircraft type ratings for all pilots serving as other than pilots in command, or as second in command of an aircraft requiring three or more pilots.

Part 41 currently provides for two different types of pilot crew complements: namely, (a) a two-pilot crew and (b) a three or more pilot crew. With respect to the two-pilot crew, upon reevaluation of the original

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3. *Initial training qualifications of pilots other than pilots in command.* The complexity of modern aircraft and the operational demands of today's navigation, communication, and air traffic control systems require a high level of skill and competence for air carrier copilots. Many of the functions which are required of the copilot, particularly with respect to emergency procedures, must be performed properly or the safety of the flight may be seriously affected. In addition, in the event that the pilot in command becomes incapacitated during flight, the copilot must possess adequate knowledge and skill to fly the aircraft safely to a destination.

In order to properly determine the ability of the copilot to operate a particular type of aircraft, it was proposed in Draft Release 59–3 to provide for the issuance of appropriate aircraft type ratings for all pilots serving as other than pilots in command, or as second in command of an aircraft requiring three or more pilots.

Part 41 currently provides for two different types of pilot crew complements: namely, (a) a two-pilot crew and (b) a three or more pilot crew. With respect to the two-pilot crew, upon reevaluation of the original

proposal in light of comments received, it appears that the objective of the original proposal can be achieved without requiring the second in command in a two-pilot crew to obtain an appropriate aircraft type rating, provided adequate flight training for such a pilot is provided in the initial and recurrent training requirements of this part and is part of the training program approved by the Administrator.

Accordingly, the original proposal has been modified in this regulation by omitting the aircraft type rating requirement for the second in command in a two-pilot crew. In lieu of a type rating, this regulation prescribes in section 41.53b(c) certain minimum maneuvers and procedures in which it is considered necessary that pilots serving as second in command in a two-pilot crew be proficient, and requires that they receive instructions and practice in such maneuvers and procedures during initial flight training.

With regard to an operation requiring a crew combination of three or more pilots, Part 41 presently provides that the pilot in command and second in command shall hold valid airline transport pilot certificates and ratings for the aircraft when serving in such a crew combination. Since the pilot designated as second in command in a crew requiring three or more pilots is required by the present regulations to have the same basic qualifications as the pilot in command, it is deemed reasonable to require such second in command to be initally trained on the aircraft to a degree of proficiency commensurate to that of the pilot in command. Accordingly, the provisions of this amendment require a pilot serving as second in command in an operation requiring three or more pilots to comply with the same initial training requirements as apply to the pilot in command.

With respect to pilots other than the pilot in command and second in command in a crew complement requiring three or more pilots, the original proposal has been modified so as not to require such pilots to obtain an aircraft type rating. In lieu of a type rating, this regulation requires in the interest of safety that such pilots accomplish the initial training prescribed in section 41.53b(a). In this connection it should be understood that such pilots will not be required to comply with the training requirements specifically applicable to a pilot in command, or a second in command serving in a crew requiring three or more pilots.

4. *Proficiency checks for pilots other than pilots in command.* In order to make certain that all pilots serving as second in command are initially proficient and continue to maintain their proficiency to pilot and navigate, and to perform their duties on, aircraft to which they are assigned for duty, it was proposed in Draft Release 59–3 to require proficiency checks to be given such pilots prior to their initial assignment to duty and twice each 12 months thereafter by a check pilot or a representative of the Administrator.

Although the air carriers were opposed to this requirement, the Agency remains firm in its belief that in order to make certain that all pilots serving as second in command are initially proficient and continue to maintain such proficiency, they must be given a proficiency check by a designated check pilot or a representative of the Administrator. However, upon reconsideration of the original proposal in the light of comments received, the Administrator has concluded that an adequate level

of safety will be maintained if such proficiency checks are given only once each 12 months to pilots serving as second in command. Accordingly, such requirements are reflected in this amendment.

In Draft Release 59–3, it was proposed to include in the proficiency check at least the takeoffs and landings and other flight maneuvers generally covered in section 41.53b(a). However, the original proposal is being modified by this amendment to provide that the proficiency check for the second in command of a two-pilot crew shall include an oral or written equipment examination, and at least the procedures and flight maneuvers specified in new section 41.53b(c).

The original proposal is also modified with respect to the second in command of a crew requiring three or more pilots to require the second in command to take the same proficiency check as is presently required for a pilot in command, except that the second in command is required to take the proficiency check only once each 12 months.

Comment received indicated that interested persons opposing Draft Release 59–3 believed the proposal would require copilots to acquire and demonstrate the same level of proficiency as is presently required of pilots in command. The Administrator wishes to make it clear that identical proficiency standards will not be required for such pilots. Under the provisions of Part 41, a pilot assigned to duty on an aircraft as second in command in a crew of two pilots is presently required to hold a commercial pilot certificate and instrument rating, whereas a pilot in command is required to hold the higher rating of an airline transport certificate with appropriate aircraft type ratings. In view of this difference in the certification requirements, pilots serving as second in command in two pilot crews will not be held to the high degree of skill required of a pilot in command. However, they will be required to demonstrate that they possess the knowledge and skill to perform their duties as a copilot safely and efficiently, and to navigate and pilot the airplane to which they are assigned safely to a destination in the event the pilot in command becomes incapacitated during flight.

This final regulation is so drafted as to permit the air carriers to use the flight crew method of training and checking pilots. Air carriers utilizing this method have found that it has economic advantages over the method of training and checking crew members individually and is an effective method of standardizing training. Although initial flight training and some proficiency check maneuvers will make it necessary in the interest of safety for the check pilot to occupy one of the pilot positions, it appears that many maneuvers can be conducted safely using the flight crew concept of training and checking pilots.

This regulation is being made effective January 1, 1961. This effective date will allow air carriers subject to Part 41 sufficient time in which to obtain FAA approval of their training programs and to accomplish the initial demonstration check of pilots other than pilot in command required by this amendment. However, each air carrier will be required to submit its training program to the FAA for approval not later than May 1, 1960.

Although compliance with the requirements prescribed in this amendment may result in some additional costs to the air carriers, it appears

that such costs are outweighed by the considerations of safety involved.

In consideration of the foregoing, the Federal Aviation Agency hereby amends Part 41 of the Civil Air Regulations (14 CFR Part 41, as amended) as follows:

1. By deleting paragraph (a) of section 41.52.

2. By deleting section 41.53 and adding a new section 41.53, and sections 41.53a through 41.53k to read as follows:

41.53 *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 sections 41.53a through 41.53e.

(d) The crew member emergency procedures training program shall include at least the requirements specified in section 41.53e.

(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.

41.53a *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 imitations;

(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 takeoff and landing;

(f) Navigation and use of appropriate aids to navigation, in-

cluding 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.

41.53b *Initial pilot flight training.*

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

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

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

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

(ii) At the authorized maximum landing weight, flight in a 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 pullout from the landing and approach configurations accomplished at a safe altitude with the critical engine inoperative or operating at zero thrust;

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

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

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

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

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

(ii) Taxiing,

(iii) Takeoffs and landings,

(iv) Climbs and climbing turns,

(v) Slow flight,

(vi) Approach to stall,

(vii) Engine shutdown and restart,

(viii) Takeoff and landing with simulated engine failure,

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

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

41.53c *Initial flight navigator training.*

(a) The training for flight navigators shall include the applicable portions of at least paragraphs (a) through (d), and (f) through (h) of section 41.53a.

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

41.53d *Initial flight engineer training.*

(a) The training for flight engineers shall include at least the instruction specified in section 41.53a (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.

41.53e *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.

41.53f *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.

41.53g *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 a 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 or second in command requires actual flight, such check shall be considered to have been met by the checks accomplished in accordance with sections 41.53j or 41.53k, respectively.

(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.

41.53h *Approval of training program.* The training program established by the air carrier under the provisions of sections 41.53

through 41.53g shall meet with the approval of an authorized representative of the Administrator: *Provided,* That the curriculum of such training program shall be submitted in appropriate form to an authorized representative of the Administrator not later than May 1, 1960.

41.53i *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 sections 41.48, 41.50, 41.51; 41.53 or 41.53g; and 41.53j through 41.53k; and 41.68 through 41.88.

(b) Check airmen shall certify as to the proficiency of the pilot being examined, as required by sections 41.50, 41.53j, and 41.53k, and such certification shall be made a part of the airman's record.

41.53j Pilot checks; pilot in command.

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

Note: The sentences in black brackets were added by Amendment 41-33, published in 25 F.R. 3850, May 4, 1960, to be effective June 1, 1960.

(b) *Proficiency check.*

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

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

(i) The flight maneuvers specified in section 41.53b(b)(1), except that the simulated engine failure during takeoff need not be accomplished at speed V_1, nor at actual or simulated maximum authorized weight.

(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.

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

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

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

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

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

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

(vi) Communication and navigation aids of the applicable airplane shall be simulated for on-the-ground and inflight operations.

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

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

41.53k *Proficiency checks; second in command.*

(a) An air carrier shall not utilize a pilot as second in command until he has satisfactorily demonstrated to a check pilot or a representative of the Administrator his ability to pilot and navigate airplanes to be flown by him and to perform his assigned duties. Thereafter, he shall not serve as second in command unless each 12 months he successfully completes a similar pilot proficiency check. The proficiency check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. Where such pilots serve in more than one airplane type, at least every other successive proficiency check shall be given in flight in the larger airplane type. The pilot proficiency check shall include at least an oral or written equipment examination, and the procedures and flight maneuvers specified in section 41.53b(c)(1). The pilot proficiency check may be demonstrated from either the right or left pilot seat.

(b) The proficiency check for the second in command of a crew requiring 3 or more pilots shall be the same as required under section 41.53j(b).

(c) Subsequent to the initial pilot proficiency check, an approved course of training in an aircraft simulator which meets the requirements of section 41.53j(b)(3), if satisfactorily completed, may be substituted at alternate 12-month intervals for the proficiency check required by paragraph (a) of this section.

(d) Satisfactory completion of the proficiency check in accordance with the requirements of section 41.53j(b) will also meet the requirements of this section.

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