Supplements 1 thru 9

Civil Aeronautics Manual 42

Irregular Air Carrier And Off-Route Rules

FEDERAL AVIATION AGENCY

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Federal Aviation Agency

Washington, D.C.

Civil Aeronautics Manual 42

Irregular Air Carrier and Off-Route Rules

Supplement No. 1, CAM 42 — **October 1, 1960**

SUBJECT: Revisions to CAM 42.

This supplement is issued to incorporate into CAM 42 Civil Air Regulations Amendments 42–28 and 42–29, and Special Civil Air Regulations SR–403A, SR–425B, SR–436A, and SR–440. This supplement also supplies a new cover for CAM 42 which shows the correct date of this manual (February 15, 1960).

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, this supplement incorporates into CAM 42 the *preambles* of all amendments to Part 42 of the Civil Air Regulations issued since the part was last revised effective December 15, 1954, and published in the Federal Register as a complete document on December 28, 1954. In addition to the preamble, the date of adoption, the effective date, Federal Register citation, and the sections affected are given for each amendment.

These preambles are set up as an addendum to CAM 42 and the page numbers are prefixed with the letter "P." It is recommended that these pages be retained in the back of the current CAM 42. Additional pages will be added as amendments to Part 42 are issued.

New or revised material is enclosed in black brackets on the pages submitted with this supplement. However, because Special Civil Air Regulations SR–403A, SR–425B, SR–436A, and SR–440, and the addendum containing the preambles of amendments to Part 42, are new in their entirety they are not so marked.

Remove the following pages:	*Insert the following new pages:*
Cover	Cover
III and IV	III and IV
VII and VIII	VII and VIII
11 and 12	11 and 12–1
35 and 36	35 and 36–1
115 through 119	115 and 116
137 and 138	137 and 138
213 through 217	213 through 218–4
231 through 235	231 through 236
	Addendum, pages P–1 through P–32

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Bureau of Flight Standards.

ATTACHMENTS.

567146—60

Contents

General

Certificate Rules

Aircraft Requirements

Aircraft Equipment

Required Records And Reports

Appendixes

Addendum

(2) Carburetor temperature gauge,

(3) Carburetor heating or de-icing equipment for each engine,

(4) Set of approved forward and rear position lights,

(5) At least one landing light,

(6) Approved landing flares as follows, if the aircraft is operated at night in extended over-water operations.

Maximum certificated takeoff weight of aircraft:		*Flares*
Less than 3,500 lbs.	5	class–3, or 3 class–2.
3,500 lbs. to 5,000 lbs	4	class–2.
More than 5,000 lbs	2	class–1, or 3 class–2 and 1 class–1.

If desired, flare equipment specified for heavier aircraft may be used.

(7) Two-way radio communications system and navigational equipment appropriate to the ground facilities to be used,

(8) Generator of adequate capacity,

(9) One set of instrument lights.

(c) *IFR (day).* For day IFR flight the following is required:

(1) Instruments and equipment specified in paragraph (a) of this section,

(2) Two-way radio communications system and navigational equipment appropriate to the ground facilities to be used,

(3) Gyroscopic rate-of-turn indicator,

(4) Bank indicator,

(5) Rate-of-climb indicator,

(6) Artificial horizon indicator,

(7) Sensitive altimeter adjustable for changes in barometric pressure, in lieu of paragraph (a) (2) of this section,

(8) Clock with a sweep-second hand,

(9) One gryo direction indicator,

(10) Generator of adequate capacity,

(11) One outside air temperature gauge easily readable from the pilot's position,

(12) One carburetor temperature gauge or equivalent approved device,

(13) Power failure warning means or vacuum gauge on instrument panel connecting to lines leading to gyroscopic instruments,

(14) Carburetor heating or de-icing equipment for each engine,

(15) Heated pitot tube for each airspeed indicator,

(d) *IFR (night).* For night IFR flight the following is required:

(1) Instruments and equipment specified in paragraphs (a), (b), and (c) of this section: *Provided,* That when any requirements under paragraphs (a), (b), or (c) of this section are identical, such requirements need not be duplicated,

42.21–1 *Seats and safety belts (FAA rules which apply to sec. 42.21 (a) (11)).* The installation and use of an approved seat and approved individual seat belt for each person over 2 years of age is required. When a child under 2 years of age is held by an adult person, the safety belt shall be used only for the adult. In small aircraft, it will be permissible to carry persons in excess of the number specified in the pertinent aircraft specification; *Provided,* That the seat or seats occupied by such persons are adequate for side-by-side seating; and a safety belt is provided for each seat. Such belt shall not be used for more persons than the number for which it is approved. In any case, the maximum certificated takeoff weight, and allowable c. g. limits of the aircraft shall not be exceeded.

(Published in 14 F. R. 7034, Nov. 22, 1949, effective upon publication.)

42.21–2 *Fire extinguishers (FAA rules which apply to sec. 42.21 (a) (12)).*

(a) A portable fire extinguisher, which shall be of an approved type, shall have a minimum capacity, if carbon tetrachloride, of 1 quart, or, if carbon dioxide, of 2 pounds, or, if other, of equivalent effectiveness.

(b) On transport-type aircraft, fire extinguishers shall be installed so as to be accessible to the passengers and ground personnel. This may be done by securing the extinguisher near the main external cabin door. An extinguisher shall be readily available to the pilot and copilot.

(c) An approved type fire extinguisher is one that has been approved by the Underwriters Laboratories or by the Administrator.

(Published in 14 F. R. 7034, Nov. 22, 1949, effective upon publication.)

42.21–3 *Altimeter (FAA policies which apply to sec. 42.21 (b) (1)).* For VFR flight at night, the installation and use of a sensitive altimeter

adjustable for changes in barometric pressure is recommended.

(Published in 14 F. R. 7034, Nov. 22, 1949, effective upon publication.)

42.21–4 *Warning lights for reversible propellers (FAA policies which apply to sec. 42.21 (a) (15)).* In the interest of cockpit uniformity, when warning lights are used to indicate to the pilot that a reversible propeller is in reverse pitch, such warning lights should be amber in color.

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

42.22 *Additional required instruments and equipment for large aircraft.* **In addition to the basic instruments required by section 42.21, the following instruments and equipment for the type of operations specified shall be installed and in serviceable condition in large aircraft:**

(a) *Day (VFR and IFR).* For flight during the day the following is required:

(1) Additional air-speed indicator,

(2) Additional sensitive altimeter,

(3) Alternate source of energy to supply gyroscopic instruments which shall be capable of carrying the required load. Engine-driven pumps, when used, shall be on separate engines and, in lieu of one such source of energy, an auxiliary power unit may be used. The installation shall be such that the failure of one source of energy will not interfere with the proper functioning of the instrument by means of the other source,

(4) In passenger service, in addition to fire-detecting and fire-extinguishing equipment necessitated as a result of compliance with section 42.12, such additional hand-type fire extinguishers as the Administrator finds necessary for compliance with section 42.21 (a) (12).

(b) *Night (VFR and IFR).* For flight during the night the following is required:

(1) Instruments and equipment specified in paragraph (a) of this section, and one additional landing light,

(2) After May 31, 1956, an approved anti-collision light; except that in the event of failure of such light, the aircraft may continue flight to the next stop where repairs or replacements can be made.

[42.22a *Flight recorders.*

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

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

[(2) On and after November 1, 1960, on all turbine-powered airplanes of more than 12,500 pounds maximum certificated takeoff weight; *Provided*, That, the Director, Bureau of Flight Standards, or his authorized representative, may extend the November 1, 1960, compliance date for any air carrier who, prior to September 1, 1960, submits to the Federal Aviation Agency in writing a request for approval for such an extension, together with substantiating data, which shows to the satisfaction of the Director or his authorized representative:

[(i) That the air carrier will be unable to comply with the November 1, 1960, date due to flight recorder procurement or installation problems, and;

[(ii) The action the air carrier has undertaken to insure that a progressive installation of the required flight recorder equipment will be completed at the earliest practicable date following November 1, 1960. In no event will the November 1, 1960, compliance date be extended beyond May 1, 1961.

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

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

[(d) In the event of failures of the flight recorder, the airplane may continue flight to the next stop where repairs or replacements can be made.

[(Amendment 42–29, published in 25 F.R. 6828, July 19, 1960, effective Aug. 18, 1960.)]

[42.22b] ***Air-speed indicators, limitations, and related information for large aircraft.***

(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.

[42.22b–1] *Airspeed limitations and related information contained in the Airplane Flight Manual (FAA policies which apply to sec. 42.22b (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,

fleet or group, it may then become part of the basic or operating fleet weight of that fleet.

(viii) Reestablishment of the operator's empty fleet weight and the basic or operating fleet weight may be accomplished between weighing periods by calculation based on the current operator's empty weight and operating or basic weight of the aircraft previously weighed.

(ix) In cases where the basic or operating fleet weight does not vary more than the tolerance allowed, but the c. g. position varies in excess of the tolerance allowed, the aircraft may be operated utilizing a basic or operating fleet weight with individual c. g. positions.

If all aircraft are weighed, the same general procedure as outlined above shall be followed if a fleet weight is to be used.

Other methods of computing aircraft loading are permissible if it can be shown that the approved weight and c. g. limits are not exceeded.

(7) *Individual aircraft weights.*

(i) *General.* When the accumulated changes to the operating or basic weight and/or c. g. position exceed plus or minus one-half of one percent of the maximum landing weight or the MAC, respectively, the loading data must be revised accordingly.

(*a*) Fuel allowance for taxiing. A compensating weight allowance of 3 pounds of fuel for each 100 horsepower. METO (or maximum continuous), available to the aircraft from all of its engines may be added to the maximum weight of the aircraft.

(8) *Weighing procedure.* Normal precautions, consistent with good practices in the weighing procedure, such as checking for completeness of the aircraft and equipment, determining that fluids are properly accounted for, and that weighing is accomplished in an enclosed building preventing the effect of the wind, shall prevail. Any nationally recognized scales may be used for weighing provided they are properly calibrated, zeroed, and used in accordance with the manufacturer's instructions. Each scale should have a calibration chart, either furnished by the manufacturer or by a civic Department of Weights and Measures. This calibration chart should not be more than 1 year old unless the particular scales have had insufficient use and have been properly stored and cared for, thereby warranting a longer period between calibrations. In case of necessity, the scales may be calibrated on the spot. In any case, the calibration of the scales and the weight precedure must be acceptable to the FAA[11] representative.

(d) *Deletion of irrelevant information.* The portion of the Maintenance Manual which requires approval by the Administrator shall not include information which does not have a direct bearing on safety of the aircraft. Such material as organization procedures, employee conduct, rates of compensation, working hours, etc., if included in the Maintenance Manual shall be confined within a separate section.

(Published in 14 F. R. 7036, Nov. 22, 1949, effective upon publication; amended in 16 F. R. 11415, Nov. 9, 1951, effective Dec. 9, 1951; amended in 18 F. R. 7527, Nov. 27, 1953; amended in 19 F. R. 6829, Oct. 23, 1954, effective upon publication.)

42.32–6 *Copy of maintenance manual in aircraft (FAA policies which apply to sec. 42.32 (d) (2)).* This manual shall contain such maintenance instructions as are necessary for the type of operations and aircraft concerned, and interpreting the air carrier's procedures to be followed in complying with the maintenance requirements of this part and the Operations Specifications. The foregoing shall not be construed as requiring an air carrier to carry in the aircraft complete maintenance and overhaul instructions for a particular type of aircraft. It is essential, however, that the manual contain such maintenance information as will provide adequate guidance for routine and emergency maintenance procedures, in addition to the air carrier's policy relative to their accomplishment.

(Published in 14 F. R. 7039, Nov. 22, 1949, effective upon publication; amended in 18 F. R. 7537, Nov. 26, 1953; amended in 19 F. R. 6829, Oct. 23, 1954, effective upon publication.)

42.32–7 *Mandatory revisions (FAA rules which apply to sec. 42.32 (d) (3)).* When the operator is instructed to incorporate changes in the manual by the Administrator or his properly authorized representatives, such changes shall

[11] FAA representative may be defined as an FAA employee, air carrier employee, or designee, who is authorized by the Administrator to approve weight and balance of aircraft.

be made promptly in all copies of the manual in the hands of designated personnel.

(Published in 14 F. R. 7039, Nov. 22, 1949, effective upon publication; amended in 18 F. R. 7537, Nov. 26, 1953.)

Flight Crew Requirements

42.40 *Airman requirements.*

(a) No air carrier shall utilize an individual as an airman unless he has met the appropriate requirements of the Civil Air Regulations: *Provided,* That, in the case of an air carrier holding a scheduled air carrier operating certificate and conducting operations in accordance with section 42.0 (a) and (b) of this part, the provisions of sections 42.44(a) and 42.45 shall not be applicable to pilots who for the previous six months have been continuously in the employ and participating regularly in the training program and established pilot training and check procedures of such air carrier and who are otherwise qualified in accordance with the requirements of Part 40 or Part 41 of this chapter.

(b) Each air carrier operating large aircraft shall designate a chief pilot who shall be responsible for seeing that no individual is assigned as a pilot unless he has met the appropriate requirements of the Civil Air Regulations.

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

42.41 *Composition of flight crew.*

(a) No air carrier shall operate an aircraft with less than the minimum flight crew required for the particular operation and the type of aircraft, as determined by the Administrator in accordance with the standards prescribed in this section, and specified in the air carrier operations manual for the area in which operations are authorized.

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

(c) *Second pilot.* A second pilot shall be required on large aircraft, or on other aircraft when passengers are carried on operations under IFR, or when the Administrator finds that a second pilot is otherwise required in the interest of safety.

(d) *Flight radio operator.* An airman holding a flight radio operator certificate shall be required for flight over any area over which the Administrator has determined that radiotelegraphy is necessary for communication with ground stations during flight.

(e) *Flight engineer.* An airman holding a flight engineer certificate shall be required on all aircraft of more than 80,000 lbs. maximum certificated takeoff weight, and on all other aircraft certificated for more than 30,000 lbs. maximum certificated takeoff weight where the Administrator finds that the design of the aircraft used or the type of operation is such as to require a flight engineer for the safe operation of the aircraft, or on other aircraft where required by the aircraft airworthiness certificate.

(f) *Flight navigator.* An airman holding a flight navigator certificate shall be required for flight over any area where the Administrator has determined that celestial navigation is necessary.

[(g) On flights requiring a flight engineer, at least one other flight crew member shall be sufficiently qualified so that, in the event of illness or other incapacity, emergency coverage can be provided for that function for the safe completion of the flight. A pilot need not hold a flight engineer certificate to function in the capacity of a flight engineer for such emergency coverage.

[(Amendment 42–28, published in 25 F.R. 2360, March 19, 1960, effective May 19, 1960.)]

42.42 *Pilot qualification for small aircraft.*

(a) *Pilot in command.* Any pilot serving as pilot in command on small aircraft shall hold a valid commercial pilot certificate with an appropriate rating for the aircraft on which he is to serve, and for:

(1) ***Day flight VFR.*** **He shall have had at least 50 hours of cross-country flight time as a pilot;**

(2) ***Night flight VFR.*** **He shall have had a total of at least 500 hours of flight time as a pilot, including 100 hours of cross-country flight time of which 25 hours shall have been at night;**

(3) ***IFR flight.*** **He must possess a currently effective instrument rating and have had a total of at least 500 hours of flight time as a pilot including 100 hours of cross-country flight.**

(b) ***Second pilot.*** **Any pilot serving as second pilot on small aircraft shall hold for:**

Appendix A

Special Civil Air Regulations
Which Affect Part 42

Page 121 follows. Pages 117 through 120 were deleted by Supplement No. 1 dated October 1, 1960.

SPECIAL CIVIL AIR REGULATION NO. SR-403A

Adopted: Aug. 4, 1960
Effective: Aug. 9, 1960

Certification and Operation of Certain Airplanes for the Department of the Interior in the Trust Territory of the Pacific Islands

Special Civil Air Regulation No. SR-403 waived certain provisions of Part 4b of the Civil Air Regulations to permit the certification thereunder of three Grumman SA-16A airplanes owned or controlled by the Department of the Interior. These airplanes were certificated for operation by Transocean Air Lines, under contract with the Department of the Interior, to provide transportation within the Trust Territory of the Pacific Islands and between those islands and the island of Guam. The airworthiness certificate for each airplane certificated under SR-403 was required to bear the following legend: "This certificate is issued pursuant to Special Civil Air Regulation SR-403 and is valid only for operation by Transocean Air Lines under contract with the Department of the Interior within the Trust Territory of the Pacific Islands and between these islands and the island of Guam."

By letter dated July 1, 1960, the Department of the Interior informed the Administrator that the contract with Transocean Air Lines expired June 30, 1960. The Department has requested that SR-403 be revised to permit the issuance of airworthiness certificates which will be valid when the Grumman SA-16A airplanes are operated by either the Trust Territory Government or by a contractor selected by that Agency. With minor exceptions, other terms and conditions of SR-403 would remain unchanged.

The circumstances which led to the adoption of SR-403 continue to exist. The safety record in operations conducted under the provisions of this regulation has been satisfactory, and the Federal Aviation Agency can continue to monitor the safety practices of any contractor by means of the air carrier operating certificate or the commercial operator certificate such persons are required to hold.

Special Civil Air Regulations Nos. SR-364 and SR-364A, which permitted Transocean Air Lines to operate PBY aircraft in the Trust Territory, are obsolete and are being rescinded by this regulation.

Since this regulatory action involves minor changes, and imposes no additional burden on any person, notice and public procedure hereon are unnecessary, and it may be made effective on less than 30 days' notice.

In consideration of the foregoing, the following Special Civil Air Regulation is hereby adopted:

1. Contrary provisions of the Civil Air Regulations notwithstanding, Grumman SA-16A airplanes owned or controlled by the Department of the Interior will be certificated under the provisions of Part 4b of the Civil Air Regulations, effective December 31, 1953, except that compliance need not be shown with the following provisions of that part. Airplanes so certificated shall be restricted to operations conducted within the Trust Territory of the Pacific Islands and between these islands and the island of Guam by the

Trust Territory Government or by an air carrier or commercial operator under contract with the Trust Territory Government.

a. Sections 4b.120(a) and 4b.120(b) to the extent that the maximum certificated takeoff weight with respect to performance cannot be met at weights of 29,000 pounds or less.

b. Section 4b.120(c).

c. Sections 4b.115, 4b.116, 4b.117, 4b.122, 4b.123, 4b.124, 4b.324(a), 4b.337(a)(1), 4b.337(a)(2), 4b.441(b)(1), 4b.474(c), 4b.484(a)(2), 4b.485(c), 4b.604(d), 4b.604(f), 4b.604(h), and 4b.622(c) to the extent that the airplane cannot comply with the provisions of these sections: *Provided,* That the Military Flight Manual, placards, or similar means shall be provided which shall contain the appropriate procedures and warnings necessary to overcome or explain the deficiencies resulting from noncompliance with these sections.

d. Sections 4b.226(b), 4b.352(b), 4b.356(b), 4b.383(b)(2), 4b.612(d), 4b.612(f), 4b.624(b) to the extent that the airplane cannot comply with the provisions of these sections.

e. Section 4b.443 to the extent that it requires the oil tank to be located outside a fire zone unless it is constructed of fire-proof materials.

f. Sections 4b.740 through 4b.743: Provided, That the Military Flight Manual shall be used as supplemented by such limitations and procedural data as found necessary by the Director, Bureau of Flight Standards, or his authorized representative, or as required by this regulation.

2. The airworthiness certificate for each airplane certificated hereunder shall bear the following legend: "This certificate is issued pursuant to Special Civil Air Regulation SR–403A and is valid only for operations conducted within the Trust Territory of the Pacific Islands and between these islands and the island of Guam by the Trust Territory Government or by an air carrier or commercial operator under contract with the Trust Territory Government."

3. The operations referred to herein shall be conducted in accordance with Part 42 of the Civil Air Regulations with the exception of sections 42.21 (a)(15), section 42.30 to the extent necessary to permit the use of military overhauled parts and supplies, and of those provisions which are inconsistent with the requirements of Part 4b for which noncompliance is authorized herein: *Provided,* That appropriate Bureau of Flight Standards personnel shall establish operating limitations consistent with the standards established herein.

4. The air carrier operating certificate or commercial operator certificate of any contractor selected by the Trust Territory Government shall be amended to the extent necessary to permit the use of said Grumman SA–16A airplanes in operations conducted pursuant to the terms of the contract.

This Special Civil Air Regulation shall become effective on August 9, 1960, and supersedes Special Civil Air Regulations Nos. SR–364, SR–364A, and SR–403.

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

567146 O - 60 - 2

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-436A

Effective: June 30, 1960
Adopted: June 27, 1960

Airborne Weather Radar Equipment Requirements for Airplanes Carrying Passengers

Special Civil Air Regulation SR-436, effective February 15, 1960, (25 F.R. 167), as amended by Amendment No. 1[1] (25 F.R. 1987), requires the installation of airborne weather radar equipment in most of the transport category airplanes used for the carriage of passengers under Parts 40, 41, or 42 of the Civil Air Regulations. Other provisions of the operation and airworthiness rules require dual sources of electrical power for such required equipment.

In regard to the requirement for dual sources of electrical power, airborne weather radar equipment uses approximately 500 to 700 VA (voltamperes) of 115 volt AC power. Airplanes which generate direct current (DC) power obtain alternating current (AC) power from power converters generally known as inverters. Inasmuch as some instruments and other equipment require AC power, transport category airplanes which basically generate DC power presently are required to have 2 inverters to supply dual power to required AC-powered equipment.

Airborne weather radar equipment uses a large portion of the output capability of the typical airplane inverter. To accommodate weather radar, prior to the promulgation of SR-436, the various AC power loads were divided between the two existing inverters in such manner that the weather radar could be turned off in the event of a single inverter failure. The remaining inverter would supply the AC power for required instruments and equipment, consistent with the dual power source requirement in the operating and airworthiness rules.

When airborne weather radar became required equipment, the installation described above would not provide for dual power sources for both the airborne weather radar and the required AC-powered instruments and equipment. To comply with the dual power requirement, the installation of an additional inverter (with suitable switching, failure indicators, and metering) would be necessary, and such installation would involve extensive modifications to all airplanes which generate DC power. In addition, for most, if not all, 2-engine airplanes equipped with 2 DC generators, the installation of an additional inverter would not fully satisfy the dual power source supply requirement, since in the event of a generator failure the combined electrical load of the weather radar and other required equipment would overload the remaining DC generator, irrespective of the number of inverters installed on the airplane.

In reconsidering the requirement for dual electrical power supply for airborne weather radar equipment, the Federal Aviation Agency recognizes the difficult engineering problem involved in providing for dual power for such equipment. Consideration has also been given to the present reliability of

[1] No distribution was made of this amendment. It corrected an inadvertent error in SR-436 by adding the word "radar" between the words "weather" and "is" in the first sentence of section 2a.

inverters as evidenced by the satisfactory use of airborne radar by the airlines with the single inverter installation. Furthermore, SR–436 requires the operator to establish procedures for the continuance of flight when the weather radar becomes inoperative during en route operations.

In view of the above, present section 5 of SR–436 is being deleted and a new section 5 is being added to permit the installation of airborne weather radar equipment which is not provided with an alternate electrical power supply.

This superseding Special Civil Air Regulation incorporates into one document all of the provisions of SR–436, as amended herein and by Amendment No. 1. Since this superseding Special Civil Air Regulation, which is substantively the same as SR–436, imposes no additional burden on any person and relieves a restriction, the Administrator finds that notice and public procedure are unnecessary and that good cause exists for making this regulation effective on less than 30 days' notice.

In consideration of the foregoing, the following Special Civil Air Regulation is hereby adopted:

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 representa-

tive 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 the effective date specified in section 6 of this regulation, 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 installed in the airplane 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. *Electrical power supply.* Contrary provisions of the Civil Air Regulations notwithstanding, an alternate electrical power supply need not be provided for airborne weather radar equipment.

6. *Effective date.* This Special Civil Air Regulation shall become effective on June 30, 1960, and supersedes Special Civil Air Regulation No. SR–436.

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 inspections. 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.

Addendum

Preambles of Amendments to Civil Air Regulations Part 42

NOTE

Part 42 of the Civil Air Regulations was last revised by the Civil Aeronautics Board with an effective date of December 15, 1954. This was not a general revision of the part, but only a reprint to incorporate outstanding amendments and to make minor editorial changes. This revision was published in the Federal Register on December 28, 1954 (19 F.R. 9214).

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Amendment 42–1

Authority of Administrator to Permit Appropriately Certificated Operators Under Contract to the Military Services to Deviate from Part 42 of the Civil Air Regulations

Adopted: Apr. 29, 1955
Effective: May 1, 1955
Published: May 4, 1955 (20 F.R. 2973)

Currently effective Special Civil Air Regulation SR–385D delegates to the Administrator authority to permit deviations from Part 42 of the Civil Air Regulations to air carriers conducting military contract operations or air carriers conducting emergency operations necessary for the protection of life or property. This regulation became effective February 1, 1955, and extended the expiration date of SR–385C until May 1, 1955, with respect to Part 42 operations only.

The substance of SR–385D was essentially that proposed by the Bureau of Safety Regulation in a notice of proposed rule making published in the Federal Register (19 F.R. 8783) and circulated as Civil Air Regulations Draft Release No. 54–26. The latter proposed to continue the basic authority of the Administrator to authorize deviations by incorporating the substance of SR–385C into Part 42 of the Civil Air Regulations, since all waivers granted pursuant to SR–385C and its predecessor regulations had been waivers of only the provisions of Part 42.

The Board was advised during its consideration of the comment received in response to Draft Release No. 54–26 that the military requirements concerning the contract carriage of personnel and goods by civil aircraft were being re-evaluated by the Department of Defense. Since defense requirements have a direct bearing on the question of continuing this deviation authority in the operating parts on a permanent basis, the Board could not make a final determination in this matter until it had received a restatement of defense requirements. Therefore, the Board issued SR–385D as a temporary regulation in order to permit continued operations in accordance with existing deviation authority until a final determination could be made as to the necessity of incorporating the deviation authority into the operating parts on a permanent basis.

The Board has now received the views of the Department of Defense relative to extending indefinitely the authority of the Administrator to grant deviations from the operating rules in Part 42 to air carriers conducting military contract operations. It is the stated desire of the Department of Defense that commercial carriers operating under military contracts should normally conduct their operations in accordance with the requirements of the Civil Air Regulations. However, the Department affirmed in all essential respects the Bureau of Safety Regulation's opinion, expressed in Draft Release No. 54–26, that world conditions are still such that an emergency requiring the immediate participation of the air carriers can develop without notice, and that operational problems also may arise in the conduct of "routine" military contract operations that can be met satisfactorily only by deviations from the normal air carrier regulations.

The Board believes that this deviation authority should be authorized only when the Department of Defense has certified to the Administrator that the operation for which a deviation is requested is essential to the national defense and requires a deviation from Part 42. Upon receipt of such certification, the Administrator may authorize such operation to be conducted subject to any terms and conditions that he considers appropriate in the interest of safety. In addition, it is the Board's view that the need for deviations shall not be based upon economic advantage or convenience to either the operator or the government, or both. These conditions have been incorporated into the amendment contained herein and should allay the fears expressed by interested persons that this authority might result in the unjustifiable lowering of the standard of safety in these operations.

With respect to the authority to deviate in operations under conditions of an emergency necessitating the transportation of persons or supplies for the protection of life or property,

the Board envisages this authority being exercised in cases such as the Texas City explosion, Kansas City floods, Hurricane Hazel, etc., where a disaster of national significance has occurred, and where the use of an emergency airlift will be necessary. Since no deviations have been granted under the previous special regulations for such emergency operations, no substantial changes have been made in the provisions covering emergency operations.

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. Since this amendment relieves a restriction and imposes no additional burden on any person, it may be made effective without prior notice.

Amendment added a new section 42.2.

Amendment 42–2

En Route Performance Operating Limitations

Adopted: May 9, 1955
Effective: May 9, 1955
Published: May 14, 1955 (20 F.R. 3296)

Currently effective section 42.74, pertaining to the transport category one-engine-inoperative en route performance operating limitations, provides that the airplane weight at take-off shall be such that, in the event of an engine failure at any point along the route, the airplane can meet a prescribed rate of climb at an altitude at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track. This amendment provides an alternative to this performance operating limitation under which, upon approval by the Administrator of Civil Aeronautics, a so-called "drift-down" procedure may be used. For some time a similar alternative has been permitted for the operation of nontransport category airplanes with no adverse effect on safety. The Board, therefore, considers that a properly planned and executed drift-down procedure would not jeopardize the safety of operation of transport category airplanes.

The Board is of the view that experience during recent years demonstrates that the jettisoning of fuel may be accomplished safely when adequate indoctrination of flight crew and other necessary precautions are provided. Accordingly, there is included a provision whereby fuel jettisoning may be used in showing compliance with this requirement if proper safeguards are taken.

Although consideration has been given to the inclusion of certain operational variables such as the incidence of downdrafts, turbulence, and icing conditions in the approval of drift-down procedures, the Board is of the view that these conditions are not sufficiently definitive and do not establish a clear criterion against which a particular drift-down procedure may be examined. They are, therefore, not included in this regulation. On the other hand, temperature and wind are measurable quantities which can be forecast with reasonable accuracy. Accordingly, the Board is of the view that account should be taken of temperature and wind. However, in order to avoid placing an undue burden upon the air carrier in accounting for these conditions, this regulation permits the use of "declared" values or other such approved assumptions with respect to their probable magnitude.

Inasmuch as this regulation prescribes an operational procedure to be used in lieu of compliance with specific performance limitations, the Board has decided that the lateral and vertical clearances should be more nearly related to operating limitations generally in effect. Since minimum flight altitudes are normally predicated on a 5-mile lateral clearance, this value is also used in drift-down procedures. However, since a vertical clearance of 2,000 feet is normally required in mountainous terrain and since terrain elevations which are critical from the standpoint of the performance operating limitations are found only in mountainous areas, the Board believes it logical to apply a 2,000-foot terrain clearance provision in this requirement.

In order that a flight with one engine inoperative not be complicated unduly by navigational problems, the Board believes that the drift-down procedure normally should be

related clearly to an approved radio navigational fix. The procedure will be so established that on either side of the governing fix a definite course will be prescribed to an alternate airport. In order to insure that these airports will, in fact, be usable under such circumstances, the Board is applying the same requirements for initial dispatch as are required currently with respect to any other alternate airport.

Although this amendment does not limit the application of a drift-down procedure to airplanes possessing reciprocating engines, the Board intends to continue its consideration of the special problems which may be raised by the introduction of turbine engines and, specifically, will consider whether any different conclusions need be reached with respect to the application of "drift-down" to turbine-powered airplanes.

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. Since this regulation imposes no additional burden on any person, it may be made effective without prior notice.

Amendment revised section 42.74.

Amendment 42–3

Miscellaneous Amendments

Adopted: July 20, 1955
Effective: Aug. 25, 1955
Published: July 26, 1955
(20 F.R. 5311)

The current provisions of section 42.12 of Part 42 of the Civil Air Regulations require, on all passenger airplanes with engines of over 600 horsepower, the installation of smoke detectors in "B" and "C" compartments. As a result of studies and discussions conducted during the 1954 Annual Airworthiness Review, certain changes to these provisions were indicated. This amendment reflects in part these changes by amending section 42.12 so as to permit the installation of heat-type fire detectors in lieu of smoke detectors in cargo compartments "B" and "C." It should be noted that Special Civil Air Regulation SR–401 permitted noncompliance with the smoke detector provisions in Part 4b and in the operating parts of the Civil Air Regulations until April 1, 1956. Concurrently with this amendment, SR–401 is being amended so that the installation of either smoke or fire detectors will not be mandatory until April 1, 1957.

The presently effective provisions of Part 4b of the Civil Air Regulations require that each transport category airplane be furnished with an Airplane Flight Manual. In addition, the presently effective provisions of Part 42 require the maintenance of an operator's manual for the use of flight personnel. In many instances the information contained in the Airplane Flight Manual has also been contained in the operator's manual. The Board is of the opinion, therefore, that the regulations should be changed so that air carriers need carry only the operator's manual in their airplanes. This amendment adds a new section 42.60a which in effect permits an air carrier to carry on its airplanes only the operator's manual if such manual also contains information required for the Airplane Flight Manual. Concurrently with this amendment, Part 4b is being amended so that each airplane need not be furnished with an Airplane Flight Manual if not required by the operating parts of the Civil Air Regulations.

Interested persons have been afforded an opportunity to participate in the making of this amendment (20 F.R. 369) and due consideration has been given to all relevant matter presented.

Amendment revised section 42.12 and added a new section 42.60a.

Amendment 42–4

Applicability of Control of Engine Rotation and Instrumentation and Equipment Requirements to Turbine-Powered Airplanes

Adopted: July 25, 1955
Effective: July 25, 1955
Published: July 28, 1955 (20 F.R. 5390)

The current engine rotation requirements and the engine instrument and equipment requirements prescribed in Part 42 of the Civil Air Regulations are not entirely appropriate for turbine-powered airplanes for the reason that these requirements have been developed on the basis of experience with reciprocating engine airplanes, which until the present time have been the only airplanes operated under Part 42. Since it was evident that airplanes with turbine engines would be introduced into air transportation in the immediate future, a notice of proposed rule making was published in the Federal Register (20 F.R. 4593) and circulated to the industry in Civil Air Regulations Draft Release No. 55–16 on June 23, 1955, which proposed to revise the engine rotation and engine instrument requirements of Part 42 so as to render them appropriate to turbine-powered airplanes. Comment received in response to Draft Release No. 55–16 expressed objection to the authority proposed to be given the Administrator in establishing engine rotation and instrument and equipment requirements for turbine-powered airplanes. Such a policy, however, has been used in the airworthiness certification of these airplanes and the Board believes it is desirable to continue this policy with respect to the operating rules discussed herein until detailed requirements based upon operational experience can be prescribed.

Currently effective section 42.13 of Part 42 requires that multiengine aircraft having any engine rated at more than 480 h.p. for maximum continuous operation shall be so equipped that the rotation of each engine may be stopped promptly in flight. However, on the basis of current information, it does not appear that the extremely slow rotation of feathered propellers of some turbo-propeller airplanes will jeopardize safety. On the contrary, to stop the propeller completely will, in some instances, either involve additional hazards or require unduly burdensome modifications. Similarly, the rotation of a turbine engine, following engine failure, may not be as hazardous as would be stopping the engine completely in flight. This amendment, therefore, requires means for completely stopping rotation on turbine engine installations only if the Administrator finds that rotation could jeopardize the safety of the airplane.

Currently effective section 42.21 of Part 42 requires the installation of specified engine instruments and equipment. Although the required instruments and equipment can be installed on reciprocating engine airplanes, it is clear that some are not appropriate for turbine-powered airplanes. Furthermore, it is recognized that turbine engines may require instrumentation or equipment different from that for which provision is currently made in section 42.21. In view of the limited experience in air carrier operatons with such engines, the Board believes it is desirable that a determination as to what different instrumentation or equipment may be required should, for the present, be made by the Administrator on a basis of equivalent safety. Accordingly, this amendment gives the Administrator such authority with respect to turbine engine instrumentation and equipment.

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. Since this amendment relieves a restriction and imposes no additional burden on any person it may be made effective without prior notice.

Amendment revised section 42.13 and the introductory sentence of section 42.21.

Amendment 42–5

Propeller Reverse Pitch Indicators

Adopted: Aug. 31, 1955
Effective: Sept. 1, 1955
Published: Sept. 7, 1955 (20 F.R. 6546)

Currently effective section 42.21(a)(15) of Part 42 of the Civil Air Regulations requires that, effective September 1, 1955, a means shall be provided for each reversible propeller on airplanes equipped with reversible propellers which will indicate to the pilots when the propeller is in reverse pitch.

A notice of proposed rule making was published in the Federal Register (20 F.R. 4973) and circulated to the industry as Civil Air Regulations Draft Release No. 55–17 dated July 1, 1955, which proposed to extend the compliance date of section 42.21(a)(15) from September 1, 1955, to April 1, 1956. This notice was based upon consideration of information received that certain air carriers would be unable to accomplish the installation of propeller reverse pitch indicators by September 1, 1955, due to delays in the delivery of necessary parts from manufacturers.

As a result of comments received on Draft Release No. 55–17 and based on investigation by the Board and the Civil Aeronautics Administration, the Board has determined that the large majority of air carrier aircraft to which this requirement is applicable have been equipped with indicators. However, although the air carriers concerned have been diligent in their efforts to achieve compliance in all aircraft affected, some have been unable to do so because of unanticipated difficulties in the procurement of necessary parts. The Board has also determined that in the case of at least one propeller system the necessary parts will not be available in sufficient time to permit modification by April 1, 1956, the date proposed in Draft Release No. 55–17, but that all required modifications may reasonably be expected to be accomplished by July 1, 1956. The Board, therefore, concludes that the current compliance date of September 1, 1955, is not realistic and should be extended to July 1, 1956. It is expected, however, that conscientious efforts will be continued by the parties concerned to accomplish the required change as soon as possible, prior to the mandatory compliance date, in consideration of the safety factors involved.

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. Since this amendment imposes no additional burden on any person, it may be made effective without prior notice.

Amendment changed the date "September 1, 1955" to "July 1, 1956" in section 42.21(a)(15).

Amendment 42–6

Emergency and Evacuation Equipment and Procedures

Adopted: Nov. 28, 1955
Effective: Nov. 28, 1955
Published: Dec. 2, 1955 (20 F.R. 8852)

Currently effective provisions of Part 42 of the Civil Air Regulations contain certain requirements for emergency and evacuation equipment and procedures. This amendment requires air carriers operating pursuant to Part 42 to make certain additional provisions with respect to emergency and evacuation equipment and procedures.

The necessity for these additional provisions was indicated following the Board's investigation of several air carrier accidents and they have been under consideration for some time. These matters were the substance of a notice of proposed rule making which

was published in the Federal Register (17 F.R. 8022) and circulated as Civil Air Regulations Draft Release No. 52–26 dated August 29, 1952. As a result of comment received, it appeared desirable to arrange a meeting with representatives of industry to discuss particular issues. Such a meeting was held in Washington, D.C., on November 25, 1952, at which the general intent of each proposal was thoroughly discussed and specific changes in the wording of the rules were proposed.

As a result of comment received in response to Draft Release No. 52–26 and the discussions at the subsequent industry meeting, the proposals were revised and a new notice of proposed rule making was published in the Federal Register (18 F.R. 4744) and circulated as Civil Air Regulations Draft Release No. 53–15 dated August 10, 1953. Since a substantial lapse of time occurred following the issuance of Draft Release No. 53–15, and because of the changes made as a result of comment received on the revised proposals, the Board decided to publish the proposed rules again prior to taking any final action. Accordingly, the proposed rules were published in the Federal Register (20 F.R. 1016) and circulated as Civil Air Regulations Draft Release No. 55–5 dated February 10, 1955. The comment received in response thereto has been considered by the Board in the drafting of this amendment. The following are summaries of the regulatory changes made by this amendment:

1. *Means of emergency evacuation.* There are no requirements in Part 42 of the Civil Air Regulations for evacuation equipment to assist passengers in evacuating an airplane on the ground. Experience has shown, however, that in certain instances it is essential that some means be provided in addition to those required by the applicable airworthiness requirements. Accordingly, this amendment requires that at all emergency exits which are more than 6 feet from the ground means be provided to assist the occupants in descending from the airplane. At floor level exits approved as emergency exits, such means for emergency evacuation shall be a chute or an equivalent device which will be suitable for the rapid evacuation of passengers. The Board intends that this means shall be in a position for ready use during flight time (as defined by the Civil Air Regulations, "Flight Time" includes that time during which the airplane is taxiing) and so located that it will not create a hazard by obstructing any emergency exit. As an example, certain of the air carriers have already installed chutes immediately above exit doors or on brackets attached to the fuselage immediately adjacent to the doors. An approved chute so located is in a position for "ready use" within the meaning of the new section.

2. *Interior emergency exit markings.* This amendment requires, in addition to markings, the installation of a light in all passenger-carrying large aircraft to illuminate all emergency exits in such a manner as to attract the attention of the occupants of the airplane at night. The object of this requirement is to ensure that in the case of a crash landing or ditching at night the passengers and crew will be able to identify and operate emergency exits. It is further required that these lights be equipped with an integral energy supply system. Since Draft Release No. 55–5 was circulated, the Board has determined that a light designed only for manual operation, if designed to withstand the impact forces of a crash landing and continue operation, will serve as a suitable alternative to an automatic light to provide emergency lighting at those times when it is most likely to be needed. Accordingly, this amendment requires that these lights either (1) be designed to function automatically in the event of a crash landing and to continue to function thereafter and also be operable manually, or (2) be designed only for manual operation and also to continue to function after a crash landing. When such lights require manual operation to function, they must be turned on prior to each night take-off and landing. With respect to the automatic light, any approved system, whether it is designed to operate as a result of inertia forces or upon failure of the main electrical system, will be satisfactory as long as it meets the two requirements; namely, it will function automatically in the event of a crash landing and continue to function thereafter, and it is also operable manually.

3. *Equipment for extended overwater operations.* This amendment modifies and expands the current provisions to require irregular air carriers in extended overwater operations to have on their airplanes suitable equipment in the form of life vests, life rafts, signaling devices, and survival kits. This equipment is required to be installed in conspicuously marked approved locations where it will be easily accessible in the event of ditching.

An intensive investigation of ditching operations, including tests of life-raft capacity, has recently been conducted by the Civil Aeronautics Administration and the United States Navy in cooperation with other government agencies and interested aeronautical organizations. The Board has been advised that analysis of the results of these tests has not yet been

accomplished. Consequently, as indicated in Draft Release No. 55-5, pending development of satisfactory criteria of life-raft capacity, the Board is not taking any action at this time to require that such life rafts possess sufficient maximum capacity to accommodate all occupants in the event of a loss of one life raft of the largest capacity on board. In view of the foregoing, this amendment does not change the requirement that airplanes on extended overwater flights carry life rafts sufficient in number and of such rated capacity as to accommodate all occupants of the airplane.

The Board is also concerned by the lack of any current requirement that life jackets and life rafts be equipped with a means of illumination which would materially assist in the rescue of persons from the water at night. Although such a light is not yet available, the Board has recently been informed that progress is being made toward the development of a serviceable, reliable, lightweight, inexpensive light of indefinite shelf life, adaptable to such use. Therefore, the Board will consider further whether a means of illuminating life jackets and life rafts should be required when it has determined that developments are sufficiently mature to warrant such action.

The Board has carefully studied the various proposals submitted with respect to a definition of extended overwater operation as applied to scheduled and irregular operations and considers that the distance of 50 miles is a reasonable measure of such operations. Since there may exist particular operations which would require or permit some flexibility in the administration of the rule, the Administrator is authorized to require the carriage of all of the prescribed equipment, or any item thereof, for any operation over water if he finds that the standards of safety appropriate for air carrier operations so require. The rule also permits the Administrator to determine, upon application of an air carrier, how much, if any, of the equipment will be required for each extended overwater operation. Unless otherwise specified by the Administrator, the equipment required herein will be carried in all extended overwater operations.

4. *Assignment of emergency evacuation functions for each crew member.* This amendment requires each air carrier to assign emergency functions for each crew member to perform in the event of circumstances requiring emergency evacuation. The objective of this requirement is to assure that each crew member will know, and be able to perform, those basic functions which are necessary in order to accomplish an emergency evacuation. The "emergency" for which this rule requires each crew member to be prepared is that of evacuating the airplane. Although innumerable types of emergencies may arise in flight which may necessitate an emergency evacuation of an airplane, the Board is of the opinion that the procedure to be followed in evacuating an airplane remain limited in number. Therefore, it is considered reasonable, and it is the intent of this rule, to require that each crew member be prepared to perform emergency evacuation functions when necessitated by various general situations; for example, ditching, fire in flight, and landing gear collapse. This rule will not, of course, limit the authority of the pilot in command over crew members with respect to the assignment of duties under the particular conditions of an emergency.

The Board has always based its rules on the premise that wherever possible the air carrier should be responsible for assigning crew duties. It has been brought to the attention of the Board, however, that in certain instances crew duties are not sufficiently delineated and crew training programs are not sufficiently complete to provide proper coordination of the crew in the event of a crash landing or ditching. The Board considers that it is necessary to ensure that assigned crew duties are realistic, and do not, for example, require an individual to be assigned certain tasks which are not probable of accomplishment under the conditions anticipated. Therefore, these functions are required to be listed in the air carrier manual and all crew members must be made thoroughly familiar with them during both initial and recurrent training. In addition, the air carrier must show that the functions so assigned are practicable of accomplishment.

5. *Briefing of passengers.* This amendment requires each air carrier engaged in extended overwater operations to establish a procedure for orally briefing passengers in order to ensure that they will be familiar with the location and method of operation of life vests and emergency exits, and the location of life rafts. Such briefing must include a demonstration of donning life jackets.

The Board considers that it is in the public interest to attain the increased safety sought by these rules at the earliest opportunity. At the same time it recognizes that certain of the requirements involving physical changes to airplane structures and the procurement of additional equipment would be unduly burdensome unless an appropriate period of time for planning, procurement, and installation is allowed. Accordingly, a majority of these rules

need not be complied with for approximately 18 months. However, the rules involving procedures only must be complied with in approximately 6 months.

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. Since this amendment contains rules which need not be complied with for at least 6 months, it may be made effective immediately.

Amendment added the definition "Extended overwater operation" to section 42.1; revised section 42.24 and added new sections 42.24a, 42.24b, and 42.24c; added new section 42.49; and revised section 42.59.

Amendment 42–7

Elimination of the Annual Inspection of General Aircraft

Adopted: Apr. 13, 1956
Effective: July 17, 1956
Published: Apr. 20, 1956
(21 F.R. 2587)

Currently effective section 42.31(a)(2) of Part 42 of the Civil Air Regulations requires small aircraft to be maintained and inspected in accordance with a continuous maintenance and inspection system as provided for in the air carrier maintenance manual or to be given a periodic inspection each 100 hours of flight time and an annual inspection every 12 months.

Amendments are being made to Part 43 and other parts of the Civil Air Regulations concurrently with this amendment of Part 42 in order to simplify the procedures for the inspection and return to service of general aircraft, which includes small aircraft operated under Part 42. In order to bring section 42.31(a)(2) into agreement with the inspection provisions of section 43.22 of Part 43 of the Civil Air Regulations, Part 42 is being amend to provide the owner or operator with a choice of two methods of inspection. The first requires a periodic inspection once each year by an authorized mechanic; and, in addition, requires an inspection each 100 hours of time in service. The second, or alternate method, requires the use of a system whereby the inspection may be conducted on a progressive or continuous basis.

Interested persons have been afforded an opportunity to participate in the making of these amendments (20 F.R. 7380), and due consideration has been given to all relevant matter presented.

Amendment revised section 42.31(a)(2).

Amendment 42–8

Training Programs and Proficiency Checks—Use of Aircraft Simulators

Adopted: Feb. 8, 1957
Effective: Mar. 15, 1957
Published: Feb. 13, 1957
(22 F.R. 888)

Part 42 of the Civil Air Regulations currently requires certain pilot proficiency checks to be accomplished twice a year by each pilot serving as pilot in command in air carrier service. The objective of these checks is to insure that the pilot maintains a high standard of proficiency in the piloting and navigation of the airplane types to be flown by him. The proficiency checks must be given by an authorized representative of the Administrator of Civil Aeronautics or a check pilot of the carrier concerned. In addition to the normal airplane maneuvers, these checks include certain critical maneuvers which are encountered from

time to time in air carrier service such as take-offs and landings with inoperative engines, missed approaches, instrument letdowns, and various emergency procedures.

The Administrator, with the approval of the Board, has for several years approved many maneuvers required in the proficiency checks to be accomplished in synthetic trainers which accurately simulate the flight characteristics and the performance of the aircraft, to which a pilot is assigned, through all ranges of normal and emergency operations. This approval has been based in part upon an air carrier's use of the synthetic trainer in its pilot training program, and the pilot's satisfactory demonstration in actual flight of ability to perform at least 4 basic maneuvers, as follows: Flight at minimum speeds, approach to lowest approved minimums, landing under circling approach conditions, and simulated engine failure(s) during take-off.

The Board foresees, however, that the increasing complexity of aircraft, with concomitant need for devices to simulate the flight characteristics of large modern transport aircraft, will be further accentuated as turbo-prop and turbo-jet aircraft are procured. As a result, more intensive training of pilots and crews will be necessary to insure that they are proficient in the operation of these larger and faster aircraft with their corresponding new operating problems, and this training can be accomplished only at considerably increased costs. In anticipation of this problem, certain carriers are preparing to acquire simulators before the aircraft are put into service. This action is predicated on the assumption that essential training can be conducted in part in aircraft simulators more effectively, safely, and economically than in an aircraft, and with considerable saving in time.

The fundamental characteristics of the aircraft simulators in use and under consideration should be made clear in order that interested persons will clearly understand the nature of the device the Board is discussing in this amendment. The Board has in mind that the aircraft simulator shall be a full scale mock-up of the cockpit interior of a particular type aircraft with normal crew stations, plus accommodations for necessary additional persons such as check airmen, instructors, or observers. It shall also include suitable course and altitude recorders. It shall be capable of accurately reproducing the engine and flight performance, control loading, instrument indication, and control movements of the specific model aircraft during the execution of all normal and anticipated emergency maneuvers. Of great importance is the requirement that the device shall be designed to permit presentation of malfunction of aircraft, aircraft engines, propellers, appliances, systems, and other components, and appropriate procedures to cope with such emergencies. Capabilities, as outlined above, will permit intensive training and checking in normal and abnormal flight conditions, various flight procedures, navigational problems, and essential crew coordination.

Accordingly, the Board published on June 13, 1956, (21 F.R. 4294) a notice of proposed rule making as Civil Air Regulations Draft Release No. 56–16 "Training Programs and Proficiency Checks (Use of Aircraft Simulators)" in which certain proposals were made with respect to the use of aircraft simulators. The Board indicated that it was of the opinion that the advantages of the trainers were so apparent that their controlled introduction into air carrier training procedures on a wider basis was in the public interest and should be encouraged. In summary, the Board found that aircraft simulators have been proven as a valuable aid in improving the effectiveness of pilot training for instrument and equipment proficiency. The promise of further improvement in training is, in fact, so great that it appears desirable to reduce the number of in-flight proficiency checks that pilots are required to take. Simulators are particularly suited to instruction in and practice of numerous emergency procedures which cannot satisfactorily be accomplished in flight, and permit special emphasis on the coordination of crew duties: they offer a laboratory for experimentation in techniques and procedures which might be time-consuming or hazardous in flight; they will permit training to be conducted with more safety as a result of the reduction of frequency of aircraft operations under simulated emergency conditions; their use will result in the reduction of traffic congestion and noise in large terminal areas; and they will reduce substantially the total cost of pilot training programs.

The Board also indicated that, in determining the most appropriate method to realize the full possibilities of aircraft simulators, it could not lose cognizance of its responsibility to assure the highest degree of safety in air transportation even while taking this opportunity to encourage sound technical and economic development of air carrier operations. It is the Board's opinion, therefore, that the broadened use of aircraft simulators in air carrier training programs should be permitted in accordance with these basic principles:

A. The use of simulators shall be permissive with the air carriers.

B. The air carrier shall be required to show that the aircraft simulator meets prescribed standards and shall establish within its training program an approved course of training in such an aircraft simulator. It is anticipated that the training shall consist of at least several hours covering all items currently contained in the flight proficiency checks.

C. When a pilot in command satisfactorily completes each 12 months an approved course of training in an aircraft simulator which the air carrier shows meets the prescribed standards, each such pilot need accomplish only one proficiency check in flight each 12 months.

D. The Board shall review the experience gained under these regulations to determine the effectiveness of the procedures permitted thereby.

In response to Draft Release No. 56–16, the Board received from interested persons comment favorable to the Board's basic objective of permitting broadened use of aircraft simulators by air carriers. There was, however, some diversity of opinion with respect to the specific proposals to amend the operating parts. In the Board's proposal the major change from current practice was to substitute an approved simulator course for one of the two proficiency checks required to be accomplished in flight annually. Certain air carrier spokesmen indicated that they considered this an improper mixing of the training and checking functions, and stated that the regulation should simply permit the accomplishment of one of the required checks in a simulator. Furthermore, these persons also considered that it was not necessary for the Administrator to approve a particular portion of an air carrier's training program (i.e., simulator curriculum). On the other hand, pilot spokesmen expressed concern that successful utilization of aircraft simulators would be realized only through very close supervision by the Administrator, with review by the pilots, of procedures and qualifications of instructors and check personnel.

In Draft Release No. 56–16, the Board also asked for separate comment with respect to the desirability of including in the Civil Air Regulations certain specific standards for aircraft simulator equipment (Draft Release No. 56–16, Appendix A) which would be used as a basis for approval by the Administrator.

The Board has carefully studied the various views presented and is of the opinion that, at least in the initial stages of expanded simulator use by air carriers, the Administrator should approve the aircraft simulator training program of each air carrier. This procedure will be consistent with the present policy whereby the Administrator makes rules, compliance with which is mandatory, for the conduct of the proficiency checks required by the Civil Air Regulations. The Board will, however, review the experience gained under this regulation and propose any changes which, in the light of such experience, may be in the public interest.

The Board is also of the opinion, in view of the comment received, and other information, that the detailed description of the systems or conditions being simulated, and the degree of simulation, should not be prescribed in the Civil Air Regulations but should be controlled by the Administrator through the medium of the appropriate Civil Aeronautics Manual. The Board considers, however, that the broad, basic standards which describe the characteristics and function of an acceptable aircraft simulator should be included in the regulations.

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.

Amendment added a new subparagraph (4) to section 42.44(a).

Amendment 42–9

Extension of Compliance Date for Installation of Emergency Exit Lighting and Means for Emergency Evacuation	**Adopted: May 31, 1957** **Effective: May 31, 1957** **Published: June 5, 1957 (22 F.R. 3918)**

Provisions of Part 42 of the Civil Air Regulations, adopted November 28, 1955 (20 F.R. 8852) require that after May 31, 1957, for night operations, aircraft emergency exit markings shall be illuminated by a special source of light, independent of the main aircraft

lighting system. This regulation also requires that after May 31, 1957, certain means for emergency evacuation shall be installed on all passenger-carrying airplanes, as for example ropes and chutes.

By letter dated March 29, 1957, the Air Transport Association of America (ATA) requested on behalf of certain member air carriers, an extension from May 31, 1957, to July 31, 1958, of the compliance date for installation of emergency exit lights in a large number of presently operated air carrier aircraft. In support of their request the ATA described in considerable detail the problems with which the air carriers had been confronted in the design, procurement, installation, and approval of emergency exit lighting systems appropriate for many types of aircraft. Also by letter dated May 3, 1957, ATA requested, on behalf of several air carriers, an extension of the May 31, 1957, compliance date for installation of the means for emergency evacuation in certain air carrier airplanes. Extensions were requested for various periods, the maximum of which was for a period of 14 months.

The Board is greatly disturbed that progress with the installation of this emergency equipment has not met with its expectations as expressed in the amendments to Part 42 requiring such equipment and the Board does not consider the substantiating data submitted by the ATA to be sufficient to warrant extension for the period of time requested by the carriers. The Board recognizes, however, that difficulties may have been encountered by the air carriers in accomplishing an orderly procurement and installation program without serious disruption of scheduled service and that a brief period of relief may be granted without affecting adversely safety in air carrier operations.

In view of the foregoing, the Board is extending the date for compliance with the emergency exit lighting and evacuation requirements of Part 42 for a period of 90 days. The Board hereby invites each air carrier which believes that it cannot comply with such requirements within 90 days to submit to the Bureau of Safety in writing not later than July 1, 1957, a request for further extension, together with complete substantiating data as to why it cannot comply and believes it should be granted such extension. Each such request for further relief will be evaluated and the Board, prior to August 31, 1957, will take such action as it deems justified.

Since this amendment grants relief by temporarily extending the date for compliance with a requirement of the Civil Air Regulations, and delay in extending such relief would impose an undue hardship, the Board for good cause finds that notice and public procedure hereon would be contrary to the public interest and may be omitted and that this amendment may be made effective immediately.

Amendment changed the date "May 31, 1957" to "August 31, 1957" in section 42.24c (a) and (b)(2).

Amendment 42–10

Admission to Flight Deck

Adopted: July 11, 1957
Effective: Aug. 15, 1957
Published: July 16, 1957
(22 F.R. 5573)

Section 42.51(g) of Part 42 of the Civil Air Regulations specifies the persons who may be admitted to the flight deck of an aircraft operated under the provisions of Part 42.

A growing need for in-flight observation of equipment and procedures has been verified by the Board in the granting of many recent waivers, and the experience gained in operations subject to such waivers has been excellent. Accordingly, section 42.51(g) is being amended to include in the list of persons authorized to be admitted to the flight deck, without having a seat available in the passenger compartment, certain operations personnel of the air carrier and technical representatives of the manufacturer of the airplane or components thereof. It is contemplated that authorization for such operations personnel and technical representatives will be granted by the air carrier only when the presence of such persons in the pilot compartment is required in the furtherance of their functions of observing and monitoring the in-flight operations of the air carrier or its equipment. It should be clearly under-

stood that it is not intended by this amendment to compromise in any way the authority of the pilot in command to refuse such persons admission to the flight deck.

This amendment was published in the Federal Register (21 F.R. 6573) as a notice of proposed rule making and circulated to the industry as Civil Air Regulations Draft Release No. 56–24, dated August 22, 1956. Certain comments received in response to Draft Release No. 56–24 recommended that the provisions governing admission to the flight deck be amended to give the pilot in command complete discretion with respect to admitting persons to the flight deck. The Board has given careful consideration to this recommendation, but is of the opinion that it would not be in the interest of safety to grant to the pilot in command any greater discretion than that provided for in this amendment.

In order to achieve uniformity in the Civil Air Regulations, similar amendments are being made to the corresponding sections in Parts 40 and 41 of the Civil Air Regulations which pertain to admission to the flight deck. However, it is appropriate to note that inasmuch as certain aircraft operating pursuant to Part 42 do not have separate pilot compayments, the title to the amendment to Part 42 has been so worded as to make it applicable only to aircraft having separate pilot compartments.

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.

Amendment revised section 42.51(g).

Amendment 42–11

Flight Recorders

Adopted: Aug. 5, 1957
Effective: Sept. 9, 1957
Published: Aug. 9, 1957
(22 F.R. 6379)

On two occasions within the past several years, the Board has amended the Civil Air Regulations to require the use of a recording device on aircraft used in air transportation. In the first instance the Board found it necessary to rescind the rule because of the difficulty operators were having in providing proper maintenance due to procurement and transportation difficulties brought on by World War II. In the second instance the Board found that, contrary to earlier indications, there was no device readily available of proven reliability and fully adequate for the purpose intended. The Board gave notice, however, that a requirement for a recording device would be reconsidered at such time as a suitable instrument became available.

On November 10, 1955, the Board, having received information that a suitable instrument was available, circulated Civil Air Regulations Draft Release No. 55–26 which proposed in the alternative that flight recorders be required equipment on all large 4-engine and 2-engine airplanes originally type certificated under Part 4a or Part 4b of the Civil Air Regulations or that they be installed only on large transport category airplanes designed to operate above 25,000 feet altitude.

Although much comment, both written and oral, was received by the Board on this draft release, there was no significant opinion expressed by those in favor of requiring a flight recorder on the desirability of one or the other of the alternative proposals. It was clear that interested persons either favored the general use of flight recorders or they didn't favor use of them at all.

Those favoring use of the recorders were of the opinion that recorders might have been of some value in approximately 25 percent of the accidents studied by the Board's Analysis Division; that they would do much to eliminate the conjecture, supposition, and personal opinion from analysis of both accidents and daily routine operations; that there is a recorder in being which is rugged, dependable, and will operate months on end without need for calibration; that the record can be quickly removed and read at any time without processing; and that, aside from its value in accident investigation, its use may result in improved operational procedures and airworthiness standards.

On the other hand, those opposing use of flight recorders were of the opinion that the advantage to be derived from their use in accident investigation was highly exaggerated and that at best they would be of some assistance in only a very small percentage of accidents. This, they argued, was not sufficient justification to require use of these recorders on all large transport category airplanes when it is considered that, for the scheduled airlines alone, in a five-year period it is estimated that it would cost about 9 million dollars to purchase, maintain, and stock necessary spare parts for the recorder. Furthermore, it was argued that the reliability of the one recorder in being is subject to considerable question, the inference being that since there had been two previous abortive attempts to require use of these recorders because of their unreliability it would not be justified to require their use now until more positive evidence appeared as to their reliability.

The Board, having considered the comment received in response to the proposals contained in Civil Air Regulations Draft Release No. 55–26 and other information submitted during the oral argument held April 17, 1957, concludes that a flight recorder of sufficient reliability to fulfill the objectives for such a device is in being and should be used in all large airplanes certificated for use in air transportation above 25,000 feet altitude.

The Board agrees that the costs involved in comparison to the value of the recorder for the purposes intended do not justify a requirement for the installation of flight recorders on the entire transport fleet. The cost of the equipment and its installation and maintenance appears to be prohibitive when related to the total cost of some of the smaller airplanes of the current air carrier fleet. This consideration is magnified by the relatively low income generating capacity of many current airplane types. Furthermore, flight recorders in these airplane types would be furnishing information concerning design and operations for which there already exists a very substantial body of operational experience. Accordingly, no airplane certificated for flight below 25,000 feet altitude will be required to install and use flight recorders.

The Board is of the opinion, however, that in the case of large airplanes certificated for use in air transportation above 25,000 feet altitude, a flight recorder should be required for accident investigation purposes and for use in analyzing various incidents, such as extreme vertical accelerations due to turbulence, which occur from time to time in flight but which do not result in accidents, in order to take appropriate precautionary or remedial action. Such airplanes will be operating under conditions with respect to which little operational experience directly applicable to civil transportation exists and the recorded intelligence involving these higher altitudes, pressure differentials, and speeds will help materially in making a more accurate determination of the cause of accidents of such aircraft. Furthermore, in assessing the economic impact this requirement might have on the air carriers affected, it is clear that it will be substantially less than for currently operated airplanes because of the higher initial cost of the airplanes for which flight recorders will be required and their greater seating capacity.

Interested persons have been afforded an opportunity to participate in the making of this amendment (20 F.R. 8500), and due consideration has been given to all relevant matter presented.

Amendment added a new paragraph (c) to section 42.22.

Amendment 42–12

Interior Emergency Exit Marking Lights

Adopted: Aug. 9, 1957
Effective: Aug. 9, 1957
Published: Aug. 15, 1957 (22 F.R. 6569)

Currently effective section 42.24c (b) (2) of Part 42 of the Civil Air Regulations requires that, on all large aircraft used for irregular air carrier and off-route air transportation at night, a source or sources of light with an emergency energy supply independent of the main lighting system be installed to illuminate all emergency exit markings. This particular requirement was adopted by the Board in November of 1955 in an amendment concerning emergency and evacuation equipment and procedures. The Board adopted this rule to

increase safety in the evacuation of aircraft. It was the Board's intention that through this amendment all large passenger-carrying aircraft would be equipped with lights installed so as to illuminate all emergency exits in such a manner as to attract the attention of the occupants at night and thus expedite evacuation. The Board intended that this requirement should apply specifically to passenger-carrying aircraft as is borne out by the history of the amendment and the preamble thereto. However, this provision is so worded as to be applicable to all large aircraft whether engaged in passenger or cargo operations under Part 42.

The Board has been requested to clarify its intent with respect to this provision insofar as its applicability to large aircraft used in night cargo operations is concerned. A careful review of the development of the emergency and evacuation equipment and procedure amendment reveals very clearly that the concern of all interested parties was directed almost exclusively to passenger-carrying aircraft. This is particularly apparent with respect to the emergency exit marking lighting requirements, the object of which is to insure, in the case of a crash landing or of a ditching at night, that the passengers and crew may be able to identify and operate emergency exits thus expediting evacuation of the aircraft. In airplanes used solely for the carrying of cargo, the problem of locating and operating emergency exits during a ditching or crash landing at night is not comparable to that encountered in passenger operations. Properly qualified crews are so familiar with every feature of the airplane, and the emergency exits which they would normally use are so close at hand, that special lighting for these exits is unnecessary. Furthermore, airline crews typically carry flashlights. All existing large airplane types used in this type of operation have an exit or loading door located immediately aft of the flight deck and the cockpit windows in most cases provide an additional means of crew evacuation. Furthermore, a survey of accidents involving night cargo operations indicates that there have been no difficulties in crew evacuation that would indicate a need for emergency illumination facilities for the emergency exits.

In view of the foregoing, section 42.24c (b) (2) is being amended to reflect the intent of the Board that the emergency lighting requirements apply only to passenger-carrying aircraft.

Since this amendment is minor in nature and imposes no additional burden on any person, notice and public procedure hereon are unnecessary, and it may be made effective without prior notice.

Amendment revised the first sentence of section 42.24c (b)(2).

Amendment 42–13

Land Flare Requirements

Adopted: Jan. 9, 1958
Effective: Feb. 13, 1958
Published: Jan. 16, 1958
(23 F.R. 293)

Part 42 of the Civil Air Regulations currently requires that civil aircraft carrying passengers for hire at night shall be equipped with specified types and numbers of landing flares.

The value of landing flares as required equipment was discussed at the Board's 1955 Annual Airworthiness Review. Recommendations were made at that time to amend the regulations to require the carriage of flares only in large aircraft in extended overwater operations. As a result of this discussion and further study by the Board, Civil Air Regulations Draft Release No. 56–31, "Landing Flare Requirements of Parts 40, 41, 42, and 43 of the Civil Air Regulations," was circulated to the public (21 F.R. 10255). This notice, which proposed the deletion of the flare requirement, was issued for the purpose of obtaining the views of all interested persons to assist the Board in making a complete re-evaluation of existing flare requirements.

Comment received from interested persons concerning the proposals to delete all flare requirements (as contained in Draft Release 56–31) was varried. The consensus was that landing flare requirements for all non-commercial operations and for operations which employ small aircraft for the carriage of passengers for compensation or hire should be deleted. In

this connection, it should be noted that Civil Air Regulations Draft Release No. 55–24, "Air Taxi Certification and Operation Rules" (small aircraft of 12,500 pounds or less maximum certificated take-off weight), did not propose flares as required equipment and no adverse comment was received on this proposal. With respect to air carrier operations, the Air Line Pilots Association, on behalf of the pilots, recommended the retention and improvement of flares. This position was also advanced by a manufacturer of flare equipment. The Aircraft Industries Association, on behalf of the aircraft manufacturers, and the Air Transport Association, on behalf of the scheduled air carriers, recommended deletion of the flare requirements. The Civil Aeronautics Administration did not object to the deletion of flare requirements for overland operations but did recommend their retention for overwater operations.

In support of the recommendations to retain flares, the following opinions were expressed. One was that flares insure the highest possible level of safety during emergency landings at night (including emergency landings made necessary by severe vibration or buffeting, failure of aircraft components, uncontrollable fires, or the evaluation of sea conditions preparatory to ditching). It was also the view of some persons that flares might become necessary to assist in night emergency landings resulting from possible fuel exhaustion, the cause of which could be mechanical difficulties, traffic delays, communications and navigational equipment and facilities failures, and unexpected adverse weather conditions. It was also recommended that flares should be improved to provide better ground illumination and longer burning capacity to make them more effective for use in the emergency situations described above. Other comment in support of retention of flares stressed the view that safety of air carrier operations would be jeopardized if flares are not carried in overwater operations.

The Board has carefully studied this entire matter and finds that available records concerning the use of landing flares in scheduled air carrier operations show only five instances from January 1938 to the present time in which flares have been used for emergency purposes. Four of these instances involved twin-engine aircraft and one involved a four-engine aircraft. From 1947 to the present time, no multiengine air crarrier aircraft has been involved in the dropping of landing flares for emergency purposes. There is no available evidence or data showing the effective use of landing flares in the operation of small passenger-carrying airplanes. Futhermore, the records reveal that in 55 reported instances landing flares were discharged inadvertently while the airplane was on the ground or in the air with resultant damage in many cases to the aircraft, other aircraft, ramps, and hangars. There have been instances where flares contributed to the intensity of a fire following a crash. It is also significant that the military services discontinued the carriage of flares in their passenger transport operations several years ago for reasons involving cost, maintenance, the hazard of carrying flares, and their questionable value under emergency conditions. Furthermore, the flare requirements, which have been in effect for many years, were promulgated at a time when most airplanes had a single engine with only a short operating range, when most airports or landing areas were unlighted, and the general reliability of aircraft was considerably less that that of aircraft which are presently utilized. In recent years, improved airplane performance, reliability, and operating range, more efficient airplane landing lights, a considerable increase in the number of lighted landing areas, and the development of more accurate and dependable communications and navigational aids have clearly minimized the need for landing flare installations in aircraft operations. The Board finds, however, that these developments which have greatly improved operations in the United States do not apply to the same degree in extended overwater operations.

The Board has carefully considered all of the comment received and other relevant information and has concluded that flares for passenger-carrying aircraft should not be required as mandatory safety equipment for operations conducted over land. It does find, however, that there is a continued need for their use in extended overwater operations.

Interested persons have been afforded an opportunity to participate in the making of this amendment (21 F.R. 10255), and due consideration has been given to all relevant matter presented.

Amendment revised section 42.21(b)(6).

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Amendment 42–14

Amendments Resulting from the 1957 Annual Airworthiness Review

Adopted: Apr. 14, 1958
Effective: May 17, 1958
Published: Apr. 19, 1958 (22 F.R. 2595)

The Board has been advised that the descent flight provision of the two-engine-inoperative en route requirement of Part 42 is in need of clarification. The language of this provision does not make clear the generally understood intent that the descent may be based on a net flight path. Section 42.75(b)(2) is therefore being amended to clarify the intent.

During this year's annual airworthiness meeting, the subjects of interior markings and emergency lighting for exits were discussed. As a result, changes are being made to the certification requirements to eliminate the need for the marking and lighting of crew compartment exits. Since it is considered that the operating parts should be consistent with the certification requirements, a similar amendment is being made to Part 42.

Interested persons have been afforded an opportunity to participate in the making of this amendment (22 F.R. 9116), and due consideration has been given to all relevant matter presented.

Amendment revised section 42.24c (b)(1) and (2) by inserting in the first sentence of each subparagraph between the words "all" and "emergency" the word "passenger," and revised section 42.75 (b) (2).

Amendment 42–15

Supplemental Oxygen Requirements for Sustenance and First Aid

Adopted: Aug. 27, 1958
Effective: Sept. 1, 1958
Published: Aug. 30, 1958 (23 F.R. 6748)

Part 42 contains among other things oxygen requirements for aircraft operating under this part. Civil Air Regulations Draft Release No. 58–7, which was published on March 27, 1958, proposed changes to the requirements for supplemental oxygen and associated equipment both in the airworthiness requirements and operating rules. The changes simultaneously made in Part 4b requirements will be applicable only to applications for certification filed after their effective date, but the changes in the operating rules made herein will apply to all operations thereby governed on the effective date hereof, or as otherwise provided in the text of the regulation.

The particular characteristics of turbine-powered airplanes which dictate a need for somewhat different requirements relative to the use of supplemental oxygen than those applicable to piston-engine airplanes are the higher operating altitudes at the time of a possible decompression combined with excessive fuel consumption by these turbine-powered airplanes at low altitudes which may require continued cruise at an altitude demanding sustaining oxygen to enable the airplane to reach a suitable landing field.

The base cruising altitude at which oxygen must be provided is being raised from 8,000 to 10,000 feet. It has been generally agreed that this requirement, while reducing the quantity of oxygen required, will provide an acceptable level of safety.

A provision relating to crew oxygen masks is being added. The time required for the crew to institute the use of their oxygen masks when operating at these altitudes is so short that any location of crew masks that could involve any avoidable loss of time in donning them would not be in the interest of safety. To minimize the danger inherent in this situation, one pilot will be required to wear and to use his mask at all times when operations above 25,000 feet are conducted. The other members of the flight crew will be required to have the masks on their person at all times and in such a position as to be

immediately placed on their faces for use. Since the object is to avoid any possible hazard to the passengers following decompression, it is considered necessary that the pilot wearing the mask be drawing oxygen from the system under normal conditions. Since all flight crew members would probably have specified duties following cabin depressurization, it is considered appropriate that masks should be immediately available for each flight crew member on flight deck duty.

On those flights wherein operations are conducted above 25,000 feet, the need for rapid action on the part of all occupants precludes waiting until an emergency occurs to instruct the passengers in the use of the oxygen equipment. A provision, therefore, is being included to require briefing of the passengers prior to such operations. This briefing should insure that the passengers know how to use the equipment provided. To the degree practicable, language problems should be avoided or overcome.

For all airplanes operating above 25,000 feet, oxygen and dispensing equipment must be provided for all passenger cabin occupants as well as the crew. Although a rapid descent of the airplane generally will be possible, it is felt that a 10-minute supply of oxygen would be the minimum amount that could be provided which would insure an adequate quantity for descent from higher altitudes in the event that circumstances prevent realization of the demonstrated descent rate. For purposes of computing a quantity of oxygen for descent, a uniform descent for the 10-minute period would be assumed.

For a particular operation to comply with the rules in this part the amount of sustaining and first-aid oxygen required shall be determined on the basis of cabin pressure altitudes and flight duration consistent with the operating procedures established for each such operation and route. The requirements for airplanes with pressurized cabins shall be determined on the basis of cabin pressure altitude and upon the assumption that a cabin pressurization failure will occur at that altitude or point of flight which is most critical from the standpoint of oxygen need, and that after such failure any descent to a flight altitude that will permit successful termination of the flight will not exceed the operating limitations of the airplane. Following such a failure, the cabin pressure altitude shall be considered to be the same as the flight altitude unless it can be shown that no probable failure of the cabin or pressurization equipment will result in a cabin pressure altitude equal to the flight altitude, under which circumstances the maximum cabin pressure altitude attained may be used as a basis for certification and/or determination of oxygen supply.

Interested persons have been afforded an opportunity to participate in the making of this amendment (23 F.R. 2229), and due consideration has been given to all relevant matter presented. In view of the imminence of operations to be conducted pursuant to this amendment, the Board finds that further notice and public procedure hereon would be contrary to the public interest and that this amendment may be made effective on less than 30 days' notice.

Amendment changed the titles of sections 42.26 and 42.27, added new sections 42.26–T and 42.27–T, and revised section 42.28.

Amendment 42–16

Authorization for Part 46 Operators to Conduct Certain Charter and Other Special Service Operations Under the Provisions of Part 46

Adopted: Sept. 17, 1958
Effective: Oct. 1, 1958
Published: Sept. 23, 1958 (23 F.R. 7374)

Part 46 of the Civil Air Regulations, Scheduled Air Carrier Helicopter Certification and Operation Rules, will become effective on October 1, 1958. The currently effective provisions of Part 42 permit a scheduled air carrier operating under Part 40 or 41 to conduct certain charter or other special service operations under Part 40 or 41 between points which it is authorized to serve under the terms of its operating certificate. However, the

carrier is required to have its air carrier operating certificate amended to permit such operations.

In promulgating new Part 46, it was the Board's intention that similar authorization be granted to the holders of scheduled air carrier helicopter certificates as is presently afforded carriers operating under the provisions of Part 40 or 41. It is necessary, therefore, that Part 42 be amended prior to the effective date of Part 46 in order that this authority can be provided.

Since this amendment is permissive in nature and imposes no additional burden on any person, notice and public procedure hereon are unnecessary, and it may be effective in less than 30 days.

Amendment change the reference "Part 40 or 41" to "Part 40, 41, or 46" in section 42.0(b).

Amendment 42–17

Use of Average, Assumed, and Estimated Weights

Adopted: Dec. 30, 1958
Effective: Dec. 30, 1958
Published: Jan. 3, 1959 (24 F.R. 51)

Air carriers have for many years utilized approved weight and balance control procedures involving average, assumed, and estimated weights in determining compliance with the various weight limitations of this part. Such procedures have been formally endorsed by the Civil Aeronautics Administration and the Board since December 8, 1947, the date of issuance of Safety Regulation Release No. 270. Subsequently, these procedures and the methods by which they may be carried out have been continued in Civil Aeronautics Manual 42. These procedures and the recommended methods of implementation described in Civil Aeronautics Manual 42 are a practical approach to compliance with the regulations pertaining to operating limitations without adversely affecting the safety of air carrier operations. This approach recognizes that it is not possible to require literal compliance with the weight and balance requirements of Part 42 of the Civil Air Regulations through a determination of actual weights in every instance, considering the extent of present-day air carrier operations, without drastically curtailing such operations.

To obviate the actual weighing of the airplane and its contents prior to each flight, certain approved methods and procedures have become an essential part of day-to-day air carrier operations and insure reasonable compliance with the appropriate operating limitations. For a fleet or group of airplanes of the same model and configuration, an average operating fleet weight is utilized when the operating weights and positions of the center of gravity are within the limitations established by the Administrator in Civil Aeronautics Manual 42. For example, an operator of a fleet of more than 9 airplanes of the same model and configuration must weigh periodically at least 6 of these airplanes, plus at least 10 percent of the number over 9. Furthermore, to insure that a safe average weight is maintained, certain safeguards are incorporated in the approved weight procedures. If the basic operating weight of any airplane weighed or the calculated basic operating weight of any one of the remaining airplanes in the fleet varies by an amount more than plus or minus one-half of one percent of the maximum landing weight from the established basic operating fleet weight, that airplane will be eliminated from the group and operated on its actual or calculated weight. Carriers also may elect to use either the actual passenger weight or the average passenger weight to compute passenger loads over any route except in unusual cases as, for example, a passenger load consisting of an athletic team. The average weights which may be used are set forth in Civil Aeronautics Manual 42. In determining compliance with certain operating limitations such as landing distance limitations, the carrier may assume that the take-off weight of the airplane is reduced by the weight of the fuel and oil expected to be consumed in flight to the field of intended destination and the weight of such fluids may be established on the basis of actual weight, a stand-

ard volume comparison, or a volume comparison utilizing appropriate temperature correction factors to actually determine the weight by computation of the quantity of fluid on board.

There are many other instances in which average, assumed, or estimated weights are used in the conduct of air carrier operations.

It has recently been brought to the Board's attention that the absence of explicit authority in Part 42 for the use of average, assumed, or estimated weights in accordance with procedures approved by the Administrator has given rise to concern that an air carrier might be considered in technical violation of the Civil Air Regulations if the weight of a particular airplane actually exceeded any of the various weight limitations of this part, even though the calculations had been made in accordance with approved procedures.

In order to remove any doubt as to the legality of using such approved procedures and to bring the regulations into accord with a well-established and safe administrative practice, Part 42 is being amended to provide specific authority for the use of an approved weight and balance control system in which average, assumed, or estimated weights may be utilized if such system gives assurance of results substantially equalling direct weighing.

Since this amendment merely confirms an established administrative practice essential to the maintenance of safe, optimum air carrier operations and imposes no additional burden on any person, the Board finds that notice and public procedure hereon are unnecessary and that good cause exists for making this amendment effective without prior notice.

Amendment added a new sentence at the end of section 42.14.

Amendment 42–18

Absence of Flight Crew Members from Their Duty Stations

Adopted: Apr. 17, 1959
Effective: Apr. 22, 1959
Published: Apr. 23, 1959
(24 F.R. 3154)

Section 42.51(f) provides, in the case of aircraft requiring two or more pilots, that two pilots shall remain at the controls at all times during take-off, landing, and while en route except when the absence of one is necessary in connection with his "regular duties." As used in this regulation the term "regular duties" was intended to mean those duties involving the operation of the airplane. It was not intended to encompass activities related to furthering public relations or other activities not related to operational safety of the airplane. The absence of a flight crew member from his duty station for the performance of such activities reduces unnecessarily the degree of vigilance, attention to duty, and availability for emergency action required for the operation of modern aircraft under conditions of high density traffic.

The provisions of section 42.51(f) are therefore being amended by a new section 42.64 to clarify their intention and application. Since the present section 42.51(f) refers only to pilots, the new section will also be made applicable to all other flight crew members. The present section 42.51(f) does not expressly require that flight crew members keep their seat belts fastened at their respective stations and this provision is being included in the new section. In addition, section 42.51(f) presently permits the absence of a pilot from his seat when he is replaced by a person "authorized" by section 42.51(g). It is to be noted that section 42.51(g) regulates the admission of persons to the pilot compartment and does not in fact authorize any person to replace any flight crew member. The reference to this section is therefore being eliminated.

Accordingly, the provisions of section 42.51(f) are being amended as indicated above. Amendments to the same effect are simultaneously being made to Parts 40, 41, 46, and 60 of the Civil Air Regulations to provide identical rules for all operations covered by those parts.

The changes being made constitute primarily a clarification of present requirements. In connection with the requirement as to seat belts and the application of the section to all flight crew members, I find that the proposed amendment must be adopted in order to obtain uniform and optimum safe operating procedures for the prevention of collisions

between aircraft. Accordingly, compliance with the notice, procedures and effective date provisions of section 4 of the Administrative Procedure Act are impracticable and contrary to the public interest and good cause exists for making this amendment effective on less than 30 days notice.

Amendment deleted paragraph (f) of section 42.51 and redesignated paragraph (g) as paragraph (f), and added a new section 42.64.

Amendment 42–19

Extension of Compliance Date for Oxygen System Requirements for Turbine-Powered Airplanes

Adopted: July 29, 1959
Effective: July 29, 1959
Published: Aug. 4, 1959
(24 F.R. 6241)

Currently effective sections 42.26–T(a), 42.27–T(a), and 4228(b) provide that on and after July 31, 1959, turbine-powered airplanes shall comply with requirements therein with respect to supplemental oxygen for sustenance, supplemental oxygen for emergency descent and first aid, and oxygen equipment standards.

These regulations, which were adopted on August 27, 1958, were not made mandatory until July 31, 1959, in recognition of the fact that currently operating turbine-powered airplanes were not type certificated in accordance with these provisions and operators would need reasonable time to arrange for appropriate design changes and procurement and installation of the required equipment.

The Administrator has been advised that, despite diligent efforts by air carrier operators and the manufacturer involved, compliance by July 31, 1959, is not possible, due primarily to the time required for system evaluation and late delivery of necessary parts. It now appears that an additional four months will be required to show compliance with the requirements.

The selection of the July 31, 1959, date for compliance was predicated on the belief that this afforded sufficient time to make the necessary changes. It is recognized, however, that difficulties have been encountered by the air carriers in accomplishing an orderly procurement and installation program without serious disruption of scheduled service and that a period of relief may be granted without affecting safety adversely in air carrier operations by extending the compliance date to November 30, 1959. As before, the currently effective oxygen system requirements will apply, 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.

Since this amendment grants relief by extending the date for compliance with a requirement of the Civil Air Regulations, and delay in extending such relief would impose an undue hardship, the Administrator for good cause finds that notice and public procedure hereon would be contrary to the public interest and may be omitted and that this amendment may be made effective immediately.

Amendment changed the date "July 31, 1959" to "November 30, 1959" wherever it appeared in sections 42.26–T(a) and 42.28(b), and revised the first sentence of section 42.27–T(a).

Amendment 42–20

Frequency of Pilot Proficiency Checks

Adopted: Sept. 24, 1959
Effective: Oct. 29, 1959
Published: Sept. 30, 1959 (24 F.R. 7866)

Part 42 of the Civil Air Regulations presently requires each pilot in command to successfully pass pilot equipment and proficiency checks within the preceding 6 months. Section 42.47 allows a grace period of 30 days for all airman checks.

Parts 40, 41, 42, and 46 specify the time interval between pilot proficiency checks differently which has resulted in varying interpretations as to requirements and administrative practices. Since no difference is intended between air carrier operations in this respect, all of the air carrier parts are being amended to make the frequency requirement of pilot proficiency checks the same.

Since this regulatory action imposes no additional burden upon any person, notice and public procedure hereon are unnecessary

Amendment revised the introductory paragraph of section 42.44(a)(4) and section 42.47.

Amendment 42–21

Retention of Flight Recorder Tapes and Clarification of Period the Flight Recorder Shall be in Operation

Adopted: Sept. 30, 1959
Effective: Nov. 6, 1959
Published: Oct. 7, 1959 (24 F.R. 8090)

Section 42.22(c) of the Civil Air Regulations requires the installation of flight recorders on all airplanes of more than 12,500 pounds maximum certificated takeoff weight which are certificated for operations above 25,000 feet altitude. The regulations further require that the flight recorders shall be operating continuously during flight time.

In promulgating this regulation, the period of time for retention of the recorder tapes was not included in the rule as it was assumed that air carriers would retain these records for a sufficient length of time for the investigation of accidents and incidents which may have occurred during the time of flight. The tapes also can furnish information to the operator concerning performance and operation of these airplane types for which there does not exist a substantial amount of operational experience.

In view of the importance of the information obtained from flight recorders, and since there may be some question as to the length of time that such tape recordings should be maintained by the air carriers, the Federal Aviation Agency believes that a clarification of the rule is needed.

As stated above, section 42.22(c) requires that the flight recorders "shall be operating continuously during flight time." It was the intention of this regulation to require the operation of the recorder only during flight and not during taxi operation to and from the runway. Therefore, in order to clarify this point, the word "time" is being deleted from this phrase since flight time has been defined as block-to-block time. In deleting the word "time," it is intended that the flight recorder must be in full operating condition at the instant the aircraft starts its takeoff roll and be in continuous operation during the flight and until the aircraft has completed its landing at an airport.

Accordingly section 42.22(c) is being amended to clarify these matters. Similar amendments are being made concurrently to Parts 40 and 41 of the Civil Air Regulations to provide identical rules for the types of air carrier operations covered by those parts.

Inasmuch as this amendment is a clarification of the present requirements and imposes no, or very little additional burden on any person, compliance with the notice and public procedure provisions of section 4 of the Administrative Procedure Act is unnecessary.

Amendment revised section 42.22(c).

Amendment 42–22

Pilot Training and Check Program

Adopted: Nov. 16, 1959
Effective: Nov. 20, 1959
Published: Nov. 20, 1959 (24 F.R. 9365)

Section 42.40(a) contains a proviso which states that the provisions of sections 42.44(a) and 42.45 shall not be applicable to pilots who for the previous six months have been continuously in the employ and participating regularly in the training program of an air carrier which has established pilot training and check procedures in accordance with the requirements of Part 40 or 41 of the Civil Air Regulations.

This proviso was adopted in 1954 as Amendment 42–27 (19 F.R. 5883). As stated in the preamble to that amendment, the purpose of the amendment was to provide that pilots of scheduled air carriers conducting charter flights and special services under the provisions of Part 42 would not have to meet the training and check requirements of Part 42 in order to operate under the operating rules of that part if they were participating in the established training and check procedures required by Part 40 or 41.

This proviso sought to eliminate unnecessary duplication of training and facilitate the administration of airman training programs on the part of the scheduled air carriers for those pilots engaged alternately in scheduled flights or charter flights and special services. It was not intended to affect those pilots operating solely in accordance with Part 42. However, it appears that some Part 42 supplemental air carriers have interpreted section 42.40(a) to mean that they may hire pilots formerly with scheduled air carriers and utilize such pilots even though the pilots have not met the provisions of sections 42.44(a) and 42.45, so long as such pilots had been continuously in the employ and had participated regularly in the established training and checking program of the scheduled air carrier. Since this was not the intent of section 42.40(a), this amendment clarifies the application of that section by expressly stating that the proviso contained in that section is applicable only to pilots of scheduled air carriers who also operate, while employed by such air carriers, under the provisions of Part 42.

Inasmuch as this amendment is a clarification of the application of the present requirements and is necessary for safety in air transportation, I find that good cause exists for making this amendment effective on publication in the FEDERAL REGISTER.

Amendment revised section 42.40(a).

Amendment 42–23

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

Adopted: Dec. 1, 1959
Effective: Jan. 1, 1961, except as provided in section 42.45g
Published: Dec. 5, 1959 (24 F.R. 9773)

Because of the effective date, this amendment is reproduced in its entirety as appendix C to this manual.

Amendment 42–24

Maximum Age Limitations for Pilots

Adopted: Dec. 1, 1959
Effective: Mar. 15, 1960
Published: Dec. 5, 1959
(24 F.R. 9776)

Notice was given in Draft Release 59–4 (24 F.R. 5249) that a proposal was under consideration to amend Parts 40, 41 and 42 of the Civil Air Regulations to provide, in part, maximum age limits for certain utilizations of pilots in aircarrier operations by an air carrier.

It was pointed out in the draft release that the number of active air carrier pilots age 60 or over has been increasing significantly in recent years, that pilots in this age group are being employed in the carriage of a substantial number of passengers, both in piston and jet-powered aircraft, and that this number will increase substantially within the next few years. Absent some limitation in the regulations, this condition could continue until a number of active pilots have, within the next 5 years, reached ages 65 to 70, and together with the then larger group over age 60 become increasingly responsible for a growing percentage of air carrier operations.

The draft release points out the reasons indicating that a hazard to safety is presented by utilization of pilots of these ages in air carrier operations. These include the fact that there is a progressive deterioration of certain important physiological and psychological functions with age, that significant medical defects attributable to this degenerative process occur at an increasing rate as age increases, and that sudden incapacity due to such medical defects becomes significantly more frequent in any group reaching age 60.

Such incapacity, due primarily to heart attacks and strokes, cannot be predicted accurately as to any specific individual on the basis of presently available scientific tests and criteria. On the contrary, the evidences of the aging process are so varied in different individuals that it is not possible to determine accurately with respect to any individual whether the presence or absence of any specific defect in itself either led to or precluded a sudden incapacitating attack. Any attempt to be selective in predicting which individuals are likely to suffer an incapacitating attack would be futile under the circumstances and would not be medically sound. Such a procedure, in light of the knowledge that a substantial percentage of any group of persons will suffer from such attacks after reaching age 60, would therefore be ineffective in eliminating the hazard to safety involved.

This conclusion is emphasized by the fact that, in the case of one large group under medical supervision over an extended period, some 85% of the persons who had a heart attack for the first time had the attack within six months to a year after a thorough medical examination had found the individual in a condition normal to his age and without any evidence to suggest the imminence of such an attack. In addition, the general good health of an individual, or the appearance of good health, are not determinative as to whether he will suffer a heart attack from the conditions that are normal as a result of age.

Other factors, even less susceptible to precise measurement as to their effect but which must be considered in connection with safety in flight, result simply from aging alone and are, with some variations, applicable to all individuals. These relate to loss of ability to perform highly skilled tasks rapidly, to resist fatigue, to maintain physical stamina, to perform effectively in a complex and stressful environment, to apply experience, judgment and reasoning rapidly in new, changing and emergency situations, and to learn new techniques, skills and procedures. The progressive loss of these abilities generally starts well prior to age 60; and, even though they may be significant in themselves prior to age 60, they assume greater significance at the older ages when coupled with the medical defects leading to increased risk of sudden incapacitation.

The older pilots as a group fly the largest, highest-performance aircraft, carrying the greatest number of passengers over the longest non-stop distances, operating into and out of the most congested airports near the largest cities, and traveling in flight in and through traffic lanes with the highest density of air traffic. A great many of these flights involve the newest, largest, fastest and most highly-powered jet aircraft. The possible hazards inherent in the oler pilot's medical condition are entirely too serious to determine the question of safety by an attempt to balance the increased chances of an incapacitating attack against the possibility that the pilot might not be engaged in the carriage of a large number of passengers at the time of such an attack.

In exploring all the ramifications of the problems involved, the nature of air traffic and air carrier operations in the future has been considered. Present indications are that the very large increases that have taken place in recent years are small in relation to the increase yet to occur. Projection of the number of pilots who will be in the 60 to 70 year age group, in an era of extreme density and frequency of jet and piston air carrier operations involving many millions of passenger miles, indicates a probability of sudden incapacitation of some of these pilots in the course of flight. While medical science may at some future time develop accurate, validly selective tests which would safely allow selected pilots to fly in air carrier operations after age 60, safety cannot be compromised in the meantime for lack of such tests. This is particularly so in light of the statutory directive contained in section 601(b) of the Federal Aviation Act of 1958 that, "In prescribing standards, rules, and regulations * * * the Administrator shall give full consideration to the duty resting upon air carriers to perform their services with the highest possible degree of safety in the public interest * * *," and that, "The Administrator shall exercise and perform his powers and duties under this Act in such a manner as will best tend to reduce or eliminate the possibility of, or recurrence of, accidents in air transportation * * *"

To the extent that a progressive loss of certain abilities generally starts well prior to age 60, further consideration is required of those aspects of safety in flight concerned with factors other than incapacitation. Especially with the development and increasing use of larger and higher performance aircraft and more complicated traffic conditions, growing importance attaches to the ability of pilots to learn new techniques, skills, and procedures, and to unlearn and discard previously learned and well-established patterns of behavior.

For this reason, the draft proposal included a provision to establish age 55 as the age prior to which an individual must obtain a type-rating for turbo-jet powered aircraft in order to act as pilot-in-command for such aircraft in air carrier service. Age 55 was selected on the basis that it marks the point at which the detrimental effects of age on physiological and psychological functions have become significant.

All interested persons have been given an opportunity to comment and all comments received have been given careful consideration. Many strong arguments were made, both in favor of and against the draft proposal. Some of the comments in favor of the proposal recommended more stringent action than that now being taken in this amendment, and referred to opinions and conclusions more far-reaching than those expressed above. Some of these were received from active airline pilots, although a majority of those identifying themselves as airline pilots from whom comments were received were adverse to the proposal.

The Air Transport Association, representing the major scheduled air carriers conducting charter flights and special services or scheduled cargo operations under the provisions of Part 42, was in favor of the proposal as to age 60. One large supplemental air carrier was opposed to the entire proposal. The Air Line Pilots Association, from which most complete and voluminous comments were received, was also opposed to the proposals, but offered no practicable substitute to achieve the safety aims of this amendment. The position taken was that qualification of a pilot should be determined on an individual selection basis without any limitation as to chronological age. This is rejected as an inadequate safety standard in light of the present inability of medical science to provide a reliable and valid basis for selection.

Some requests for a public hearing were received. In the rulemaking process, a public hearing has basically the same purpose as written comments, namely, to inform the Agency of the facts and opinions of the public concerning the proposed rule. It serves a useful purpose, however, when it provides something more than usually is obtained from written comments. Normally, this would involve situations where facts and views cannot be expressed adequately by written comments, where written comments cannot properly be evaluated without further development in a public hearing, or where written comments which have been received raise new issues which require further public consideration and this can be accomplished most satisfactorily and expeditiously in a hearing.

Comments were received covering all the issues involved in the proposed rule. They have been most carefully evaluated with respect to their bearing on some of the requests that were received for a public hearing. In respect to the provision to establish age 55 as the age prior to which an individual must obtain a type-rating for turbo-jet powered aircraft, it is possible that a hearing may produce further information or data not already encompassed in the scope of the comments received. The comments and other data available appear to be sufficiently precise and determinative in connection with the provisions applicable to utilization of a pilot after attainment of age 60. In this connection, the requests

for a public hearing did not indicate any area that the comments have not covered adequately nor was any showing made that they could not be evaluated properly without a public hearing. They did not point out any issue that was not previously considered. On this point a public hearing is likely to repeat opinions and evidence already submitted in the form of written comments. With respect to this provision of the proposed rule, therefore, it does not appear that a public hearing would serve a useful purpose; and it is not deemed necessary in the public interest.

After considering all of the comments received, I find that a public hearing is necessary and appropriate with respect to the proposal concerning eligibility to obtain a type-rating for turbo-jet powered aircraft after the attainment of age 55 and a notice for such a hearing on January 7, 1960, is being issued. I find further that establishment of a maximum age of 60 for pilots utilized by air carriers in air carrier operations is necessary for safety in air commerce and is in the public interest.

In answer to some of the comments received from air taxi operators and other operators of small aircraft it appears necessary to point out that this amendment will not apply to pilots of small aircraft. At the time that the proposal was issued as a draft release it was contemplated that such operations would shortly be conducted pursuant to the provisions of a new Part 47. However, since the effective date of that part has been suspended, and such operations will continue to be conducted under Part 42 for an additional period, this amendment to Part 42 has been expressly limited to large aircraft. This amendment will, of course, apply to pilots of large aircraft when utilized by commercial operators subject to the provisions of Part 42. The necessity of a maximum age limitation to pilots of small aircraft utilized by air taxi and other commercial operators will be the subject of further study by the Agency. If such a requirement is found necessary it will be issued as a separate proposal for comments by the public.

Amendment added a new paragraph (c) to section 42.40.

Amendment 42–25

Extension of Compliance Date for Oxygen System Requirements for Turbine-Powered Airplanes

Adopted: Nov. 30, 1959
Effective: Nov. 30, 1959
Published: Dec. 8, 1959 (24 F.R. 9840)

Currently effective section 42.27–T(a) provides that on and after November 30, 1959, turbine-powered airplanes with pressurized cabins shall comply with the provisions of section 42.27–T. Section 42.27–T(c) requires that 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.

The airlines now operating jet aircraft have represented to the Administrator that this requirement is not necessary to achieve the highest degree of safety in air transportation, and have indicated that its effect may even be adverse to safety. The FAA intends to make further studies of this matter during the next 60 days. Under these circumstances the effective date of this requirement will be delayed until February 1, 1960, to obtain additional information. If a change in this requirement is indicated, it will be accomplished prior to that date. If no change is required, the original rule will then become effective.

Since this amendment grants relief by extending the date for compliance with a requirement of the Civil Air Regulations, the Administrator finds that notice and public procedure hereon are not necessary, and that this amendment will be made effective immediately.

Amendment revised section 42.27–T(c).

Amendment 42–26

Drinking and Serving of Alcoholic Beverages

Adopted: Jan. 6, 1960
Effective: Mar. 10, 1960
Published: Jan. 9, 1960 (25 F.R. 170)

A notice of proposed rule making was published in the FEDERAL REGISTER of July 3, 1959 (24 F.R. 5424) and circulated to the industry as Draft Release 59–7, dated July 3, 1959, which proposed to amend Part 42 by adding a new section 42.65 to prohibit (1) the drinking of any alcoholic beverage aboard an air carrier aircraft unless the beverage has been served by the air carrier operating the aircraft, and (2) the serving by the air carrier of such beverage to any person who is or who appears to be intoxicated.

A large number of comments were received from individuals, air carriers, and other industry representatives. These comments ranged from opposition to hearty endorsement of the proposal, including suggestions that it did not go far enough and that all drinking and serving of alcoholic beverages aboard air carrier aircraft should be prohibited. Many of the comments were motivated by moral, religious, or social considerations, as well as safety.

The Federal Aviation Agency, when it proposed the rule, did so only after careful investigation and study. The Agency's responsibility is only for the air safety considerations and not for the social or moral aspects. The study and investigations which preceded the notice of proposed rule making were largely conducted by the Civil Aeronautics Administration, one of the predecessor agencies of the Federal Aviation Agency. The result indicated that there was no factual information, nor any specific occurrences sufficient to establish a safety hazard arising from the serving of alcoholic beverages by the air carrier to passengers aboard air carrier aircraft. The instances which were revealed tended to show that the occasional difficulties experienced had been caused either by passengers who had consumed a considerable quantity of alcoholic beverages prior to boarding the plane, or by those who drank from their own bottles during the course of the flight. This conclusion has been emphasized and verified by many of the comments received from the air carriers affected.

In addition to being confined to the safety aspects of this problem, the proposal was designed to regulate only so far as was necessary to meet safety requirements. It proposed to interfere as little as possible with the personal freedom of passengers and at the same time to prevent abuses that could possibly create a hazardous situation. It was for this reason that the proposed rule did not prohibit the consumption of alcoholic beverages, but sought to subject it to reasonable control. It is a generally accepted fact that flat prohibition has not proven successful in preventing consumption of alcoholic beverages. In this type of situation, it might even work adversely, since passengers who wish to drink might either do so to excess in advance of the flight, knowing that they could not obtain a drink aboard an aircraft, or would be encouraged to engage in surreptitious drinking from their own supply after boarding.

Some of the carriers and individuals who commented apparently misconstrued the intent of the proposed regulation insofar as they interpreted it as prohibiting passengers from bringing their own liquor aboard an aircraft. This was not our intention. The restriction proposed is against the consumption of alcoholic beverages unless they are served to the passengers by the air carriers. So construed, this would permit persons to bring liquor aboard and have it served to them by the air carrier, if the air carrier wishes to provide such service. Some of the comments received from individuals made the point that they were accustomed to having a drink before a meal, or that they required or desired some liquor for medicinal reasons or to contribute to their peace of mind while flying. The rule as proposed and adopted herein would permit a carrier to develop its own policies in this regard so that it might accommodate the varying needs of its passengers, and at the same time prevent any safety hazard.

There was also some misapprehension as to the extent of the carrier's and its personnel's responsibility for enforcing this regulation. Some apparently thought that the crew members would be required to restrain physically a passenger who wished to consume drinks that were not served to him by the carrier, and they foresaw difficulties with discharging such a responsibility. This regulation would impose no such responsibility on the flight

crew members. This regulation, like all other regulations adopted by the Agency, would be enforced through the various enforcement processes of the Agency. It is expected of the carriers that they would advise their passengers of the restriction in such a regulation and make suitable reports to the Agency of any known violations. The only time it would be expected that a crew member would be required to take direct action would be when such action is required for the safety of the flight. This is no greater burden than that now on the crew members to do whatever is necessary for the safety of the aircraft and the persons aboard it.

Several comments were made pointing out that the proposed rule prohibited an air carrier from serving an alcoholic beverage to any person if such person "is or appears" to be intoxicated. It was pointed out that a person might not appear to be intoxicated when, in fact, he or she was, and those commenting did not feel that it was proper to impose responsibility for this type of judgment. With this the Agency agrees and the words "is or" will be stricken from the proposed regulation, so that the carrier and its personnel may rely on the appearance of the passenger in determining whether or not to serve him or her alcoholic beverages. Two of the carriers proposed that action on the proposed regulation be delayed to permit the air carrier industry to develop a code which would control the amount and time of serving alcoholic beverages aboard aircraft. The Agency is strongly in favor of any such voluntary agreements that can be reached among the carriers. To the extent that they are in effect and complied with, they would clearly contribute to decreasing any safety hazard arising from the consumption of alcoholic beverages aboard air carrier aircraft. On the other hand, a code of this kind could not reach the principal problem involved—that of uncontrolled consumption by a passenger of his own liquor supply. Therefore, the adoption of a code, while extremely helpful, would not meet the entire problem. The adoption of this regulation will not in any way inhibit the industry from adopting their own code, and in fact such a move would be viewed with favor by this Agency.

Interested persons have been afforded an opportunity to participate in the making of this regulation and due consideration has been given to all relevant matter presented.

Amendment added new section 42.65.

Amendment 42–27

Requirements for Use of Oxygen Masks by Flight Crew Members of Turbine-Powered Airplanes	**Adopted:** Jan. 28, 1960 **Effective:** Feb. 1, 1960 **Published:** Jan. 30, 1960 (25 F.R. 799)

Currently effective section 42.27–T(c) provides that on and after February 1, 1960, 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.

The date for compliance with this regulation was to have been November 30, 1959, but was deferred for 60 days in order to make further studies of this matter upon representation that this requirement is not necessary to achieve the highest degree of safety in air transportation and that compliance with this regulation may detract from the required crew coordination and adversely affect safety. These studies have been made during the intervening period.

No evidence has been presented during this time which validates the contention that the regulation is not necessary to achieve the highest practicable degree of safety; neither has the claim been substantiated that the regulation would adversely affect safety. It is concluded, therefore, that the original basis for the regulation remains valid and that it should remain in effect.

During the course of the study it was noted that the various types of masks intended to be used in compliance with this regulation differ in the facility with which they can be

donned. For example, some masks can be placed on the face with one hand so that they are properly secured and sealed. This is accomplished by having retaining means already in place on the head. This feature permits the mask to be placed on the face with minimum delay and without disturbing headphones, glasses, or hats. Thus, the crew member can proceed with emergency procedures quickly and without distraction. Therefore, it is believed that if all crew members are provided with masks having these characteristics, safety would not be adversely affected by permitting the aircraft to be operated at flight altitudes up to 30,000 feet without requiring one pilot at the controls to wear and use an oxygen mask. Therefore, the regulation is being relaxed to the extent that a pilot need not wear a mask at or below 30,000 feet if all flight crew members are equipped with masks having these characteristics. In order for any air carrier to take advantage of this relaxation, it will be necessary for existing masks to be reevaluated by a satisfactory demonstration of these characteristics to a representative of the Administrator.

It should be emphasized, however, that the Federal Aviation Agency will continue to study the need for and use of oxygen masks by flight crew members. If shown necessary by service experience, additional rule making action will be undertaken.

Since this amendment grants relief by extending the altitude above which masks shall be worn in compliance with a requirement of the Civil Air Regulations, the Administrator finds that notice and public procedure hereon are not necessary, and that this amendment may be made effective immediately.

Amendment revised section 42.27–T(c).

Amendment 42–28

Emergency Coverage for the Flight Engineer Functions in the Event of Illiness or Incapacity	Adopted: Mar. 14, 1960 Effective: May 19, 1960 Published: Mar. 19, 1960 (25 F.R 2360)

A notice of proposed rule making was published in the FEDERAL REGISTER (24 F.R. 6772) and circulated to the industry as Civil Air Regulations Draft Release No. 59–12 dated August 14, 1959. Comment was requested not later than October 20, 1959.

Full consideration has been given to all comments received in response to Draft Rclease 59–12.

The proposed amendment required that at least one other flight crew member be sufficiently qualified so that, in the event of illness or other incapacity of the flight engineer, emergency coverage would be provided for the flight engineer's functions. A similar requirement is currently effective for the scheduled air carrier operations conducted under the provisions of Parts 40 and 41 of the Civil Air Regulations.

Amendment added a new paragraph (g) to section 42.41.

Amendment 42-29

Installation of Flight Recorders on Turbine-Powered Airplanes

Adopted: July 12, 1960
Effective: Aug. 18, 1960
Published: July 19, 1960 (25 F.R. 6828)

The Federal Aviation Agency published a notice of proposed rulemaking in the Federal Register (25 F.R. 2734) stating that it had under consideration certain amendments to Parts 40, 41, and 42 of the Civil Air Regulations to require the installation and use of flight recorders on all large (more than 12,500 pounds maximum certificated takeoff weight) turbine-powered airplanes after September 1, 1960. The proposal was circulated to the aviation industry as Draft Release 60-6, dated March 28, 1960, and comments were requested on or before May 3, 1960.

Comments received from certain of the manufacturers of flight recorders indicated that the September 1, 1960, date would not provide them with a sufficient period of time to manufacture and deliver equipment ordered for installation on those turbine-powered airplanes now in operation which previously have not been required to be so equipped. In addition, certain manufacturers stated that more recently developed flight recorders capable of recording additional parameters can be supplied by late 1960, and early 1961, and confirmed that some air carriers had indicated a very definite interest in these newer types of recorders.

The FAA recognizes that flight recorders capable of recording additional operations and maintenance parameters would make available information which would be most useful for incident and accident investigations and for accident prevention purposes. Furthermore, it appears that such recorded information would be used by the air carriers in developing more efficient maintenance and operations procedures and in developing new methods of establishing maintenance schedules for engine, accessory, and component overhauls.

After consideration of all the comments received and upon further investigation thereof, FAA concluded that a longer period of time should be authorized for compliance with this regulation as it applies to turbine-propeller powered airplanes, exclusive of the turbojet airplanes which are currently required to be equipped with flight recorders. The FAA recognizes that difficulties may be encountered by the air carriers in accomplishing an orderly procurement and installation program and that a brief period of relief may be granted with respect to turbine-powered airplanes other than the turbojets without adversely affecting safety in air carrier operations. Accordingly, a compliance date of November 1, 1960, has been adopted in this final rule. Also, provision has been made in the regulation for the Director, Bureau of Flight Standards, to further extend the November 1, 1960, date for any air carrier who, prior to September 1, 1960, submits to the Federal Aviation Agency, in writing, a request for such an extension, together with substantiating data, which shows to the satisfaction of the Director:

(1) That the air carrier will be unable to comply with the November 1, 1960, date due to flight recorder procurement or installation problems and;

(2) The action the air carrier has undertaken to insure that a progressive installation of the required flight recorder equipment will be completed at the earliest practicable date following November 1, 1960. In no event will the November 1, 1960, date be extended beyond May 1, 1961.

This relaxation of the original proposal will provide the air carriers further opportunities to investigate the various types of recorders available and to proceed with the orderly procurement and installation of the required equipment at the earliest practicable time following the effective date of this rule.

It will be noted that neither the November 1, 1960, compliance date nor the provision for extension thereof applies to the large turbojet airplanes or large nonturbine-powered airplanes certificated for operations above 25,000 feet altitude, since they are required by currently effective regulations to be equipped with flight recorders.

One comment received requested that consideration be given to exempting turbine-powered airplanes under 35,000 pounds maximum certificated takeoff weight from the requirements of this rule. The FAA classifies all airplanes of more than 12,500 pounds maximum certificated takeoff weight as large airplanes. The newer turbine-powered air-

planes are capable of operating at high speeds and at high altitudes. The FAA, in its notice of proposed rulemaking, explained that it was proposing this regulation specifically to encompass all of the newer types of high-speed turbine-powered airplanes, whether certificated to operate above or below 25,000 feet, since they are frequently subjected to similar atmospheric forces. The Agency remains convinced that all large turbine-powered airplanes should be equipped with flight recorders. Accordingly, the rules adopted herein make no exception for any turbine-powered airplane of more than 12,500 pounds maximum certificated takeoff weight.

This amendment also clarifies the FAA's intent to require continuous operation of the flight recorder from the instant the airplane starts its takeoff roll until it has completed its landing roll at an airport. Operation of the recorder is not required during taxi operations to or from the runway.

Interested persons have been afforded an opportunity to participate in the making of this regulation and due consideration has been given to all relevant matter presented.

Amendment deleted paragraph (c) of section 42.22, redesignated section 42.22a as section 42.22b, and added a new section 42.22a.
