Federal Aviation Agency
Washington, D. C.

Civil Aeronautics Manual 41

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

Supplement No. 2, CAM 41 dated Nov. 10, 1959 **Sept. 15, 1960**

SUBJECT: Revisions to CAM 41.

This supplement is issued to incorporate into CAM 41 Civil Air Regulations Amendment 41–34 and Special Civil Air Regulation SR–436A.

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 41 the *preambles* of all amendments to Part 41 of the Civil Air Regulations issued since the part was last revised effective April 15, 1955, and published in the Federal Register as a complete document on April 19, 1955. 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 41 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 41. Additional pages will be added as amendments to Part 41 are issued.

New or revised material is enclosed in black brackets on the pages submitted with this supplement. However, because Special Civil Air Regulation SR–436A and the addendum containing the preambles to amendments to Part 41 are new in their entirety they are not so marked.

Remove the following pages:	*Insert the following new pages:*
III and IV	III and IV
VII and VIII	VII and VIII
27 through 30	27 through 30–1
169 through 173	169 through 171
	Addendum, pages P–1 through P–36



OSCAR BAKKE, *Director,*
Bureau of Flight Standards.

ATTACHMENTS.

Contents

Certificate

	Section	Page
General	**41.0**	1
Issuance	**41.1**	1
Application for air carrier operating certificate (*FAA rules which apply to sec. 41.1*)	41.1–1	1
Amendment of air carrier operating certificate (*FAA rules which apply to sec. 41.1*)	41.1–2	7
Preface pages to operations specifications (*FAA policies which apply to sec. 41.1*)	41.1–3	7
Ceiling and visibility minimums (*FAA policies which apply to sec. 41.1*)	41.1–4	7
Form of application for issuance of initial or revised Operations Specifications, Aircraft Maintenance (*FAA rules which apply to sec. 41.1*)	41.1–5	12
Form of application for issuance of initial or revised Operations Specifications, Aircraft Weight and Balance Control (*FAA rules which apply to sec. 41.1*)	41.1–6	12
Policies, procedures, and limitations governing issuance and amendment of Operations Specifications, Aircraft Maintenance (*FAA policies which apply to sec. 41.1*)	41.1–7	13
Content of Operations Specifications, Aircraft Maintenance (*FAA policies which apply to sec. 41.1*)	41.1–8	15
Content of Operations Specifications, Aircraft Weight and Balance Control (*FAA policies which apply to sec. 41.1*)	41.1–9	15
Compliance	**41.2**	16
Duration	**41.3**	16
Display	**41.4**	16
Inspection	**41.5**	16

Passenger Operation Rules

Route Requirements

Airport spacing	**41.10**	16
Communications facilities	**41.11**	16
Weather reporting services	**41.12**	16
Navigational facilities	**41.13**	16
Day over-the-top short distance operations (*FAA policies which apply to sec. 41.13(a)*)	41.13–1	16
Airport lighting facilities	**41.14**	17

Aircraft Requirements

General	**41.20**	17
Radio equipment; short distance operation	**41.21**	18
Radio equipment; long distance operation	**41.22**	18

Instruments and Equipment

Emergency and safety equipment	**41.23**	19
First-aid kits (*FAA policies which apply to sec. 41.23*)	41.23–1	19
Safety belts	**41.23a**	19
First-aid kits and emergency equipment	**41.23b**	19
Equipment for overwater operations	**41.23c**	19
Emergency evacuation equipment	**41.23d**	20

	Section	Page
Supplemental oxygen; reciprocating-engine-powered airplanes	41.24	20
Supplemental oxygen for crew members (*FAA interpretations which apply to sec. 41.24(a)(1)*)	41.24-1	21
Oxygen requirements for standby crew members (*FAA interpretations which apply to sec. 41.24(a)*)	41.24-2	21
Operating instructions (*FAA policies which apply to sec. 41.24*)	41.24-3	21
Oxygen requirements for jump seat occupant (*FAA policies which apply to sec. 41.24*)	41.24-4	21
Oxygen requirements for infants-in-arms (*FAA policies which apply to sec. 41.24(b)*)	41.24-5	21
Oxygen requirements for clinical purposes (*FAA policies which apply to sec. 41.24(b)*)	41.24-6	22
Supplemental oxygen for sustenance; turbine-powered airplanes	41.24-T	22
Supplemental oxygen requirements for pressurized cabin airplanes; reciprocating-engine-powered airplanes	41.24a	23
Computation of supply for crew members in pressurized cabin aircraft (*FAA policies which apply to sec. 41.24a(a)*)	41.24a-1	23
Computation of supply for passengers in pressurized cabin aircraft (*FAA policies which apply to sec. 41.24a(b)*)	41.24a-2	24
Oxygen requirements for clinical purposes (*FAA policies which apply to sec. 41.24a(b)*)	41.24a-3	25
Oxygen requirements for infants-in-arms (*FAA policies which apply to sec. 41.24a(b)*)	41.24a-4	25
Supplemental oxygen for emergency descent and for first aid; turbine-powered airplanes with pressurized cabins	41.24a-T	25
Equipment standards	41.24b	26
Protective breathing equipment for the flight crew	41.24c	27
Protective breathing equipment and installation (*FAA policies which apply to sec. 41.24c*)	41.24c-1	27
Requirement of protective breathing equipment in nonpressurized cabin airplanes (*FAA rules which apply to sec. 41.24c(b)*)	41.24c-2	27
Instruments and equipment required for continuance of flight	41.25	27
Warning lights for reversible propellers (*FAA policies which apply to sec. 41.25(s)*)	41.25-1	28
[Flight recorders	41.25a	28]

Limitations

Airplane certification requirements	41.26	29
Operating limitations upon airplanes certificated under transport category requirements	41.27	29
General limitations	41.28	29
Takeoff limitations to provide for engine failure	41.29	30
En route limitations	41.30	30
Landing distance limitations	41.33	32
Landing distance at alternate fields	41.34	32
Definition of effective length of landing area	41.35	32
Nontransport category airplane operating limitations	41.36	33
Takeoff limitations	41.36a	33
En route limitations; one engine inoperative	41.36b	33
Landing distance limitations; airport of intended destination	41.36c	34
Landing distance limitations; alternate airports	41.36d	34

Maintenance

Maintenance organization	41.38	34
Alterations and repairs	41.39	34
Inspection	41.40	34
Maintenance manual	41.41	34
Contents of manual—methods and procedures for maintaining weight and balance control (*FAA policies which apply to sec. 41.41*)	41.41-1	35
Training program	41.42	38
Records	41.43	38

Instrument Approach and Landing Rules

	Section	Page
Altitude maintenance on initial approach	41.117	58
Letting-down-through procedure	41.118	59
Approach and landing limitations	41.119	59
Standard instrument approach procedures (*FAA rules which apply to sec. 41.119*)	41.119–1	59
Takeoff and landing weather minimums (*FAA rules which apply to sec. 41.119*)	41.119–2	59

Miscellaneous Operations Rules

Operations manual	41.120	60
Copies of operations manual (*FAA rules which apply to sec. 41.120*)	41.120–1	60
Airplane flight manual	41.120a	60
Admission to flight deck	41.121	60
Admission to flight deck (*FAA interpretations which apply to sec. 41.121*)	41.121–1	61
Manipulation of controls	41.122	61
Smoking rules	41.123	61
Passenger information signs	41.124	61
Marking door handles	41.125	61
Assignment of emergency evacuation functions for each crew member	41.126	61
Briefing of passengers	41.127	61
Route operation proving flights	41.128	62
Route proving flights (*FAA rules which apply to sec. 41.128*)	41.128–1	62
Aircraft proving tests	41.129	63
Aircraft proving tests (*FAA rules which apply to sec. 41.129*)	41.129–1	63
Reports	41.130	63
Mechanical hazard and difficulty reports (*FAA rules which apply to sec. 41.130*)	41.130–1	64
Irregularity report	41.131	65
Communication priority	41.132	65
Communication records	41.133	65
Flight crew members at controls	41.134	65
[Drinking and serving of alcoholic beverages	41.135]	65

Definitions

Definitions	41.137	65
Definitions; route segment (*FAA interpretations which apply to sec. 41.137(q)*)	41.137–1	66

Appendixes

Appendix A: Special Civil Air Regulations which affect Part 41	67
SR–368B. Authorization for Scheduled Air Transportation of Cargo Outside the Continental Limits of the United States Under the Provisions of Part 42 of the Civil Air Regulations	69
SR–386E. Flight Time Limitations for Pilots Not Regularly Assigned to One Type of Crew	71
SR–389B. Emergency Exits for Airplanes Carrying Passengers for Hire	73
Amendment No. 1 to SR–389B	77
SR–392B. Facilitation of Experiments with Exterior Lighting Systems	79
SR–395A. Authorization for Air Taxi Operators to Conduct Operations Under the Provisions of Part 42 of the Civil Air Regulations—Extension of Expiration Date for Air Taxi Operator Certificates	81
SR–406C. Application of Transport Category Requirements to C–46 Type Airplanes	83
SR–411A. Trial Operation of Transport Category Airplanes in Cargo Service at Increased Zero Fuel and Landing Weights	87
SR–420. Emergency Evacuation Equipment for DC–3 Type Airplanes	91
SR–422. Turbine-Powered Transport Category Airplanes of Current Design	93

		Page
SR–422A.	Turbine-Powered Transport Category Airplanes of Current Design	107
SR–422B.	Turbine-Powered Transport Category Airplanes of Current Design	127
SR–423.	Type Certification of Transport Category Airplanes With Turbo-Prop Replacements	145
SR–425B.	Provisional Certification and Operation of Aircraft	149
SR–426.	Performance Credit for Transport Category Airplanes Equipped with Standby Power	155
SR–427A.	Fuel Reserves for Multiengine Turbine-Powered Airplanes	161
SR–429.	Authorization for Alaskan Air Taxi Operators to Conduct Operations Under the Provisions of Part 42 of the Civil Air Regulations	163
SR–432.	Carriage of Persons Other Than "Crew Members" and "Passengers" Aboard All-Cargo Aircraft	165
[SR–436A.	Airborne Weather Radar Equipment Requirements for Airplanes Carrying Passengers]	169
SR–440.	Occupancy of Forward Observer's Seat During En Route Inspection	175
Appendix B:	Civil Air Regulations Amendment 41–28	177

Addendum

[Preambles of Amendments to Part 41 ..... P–1]

30, 1959, all turbine-powered airplanes shall comply with the provisions of this paragraph. The oxygen apparatus, the minimum rate of oxygen flow, and the supply of oxygen to comply with the requirements of sections 41.24–T and 41.24a–T shall meet the standards established in section 4b.651 of this subchapter effective September 1, 1958: *Provided*, That where full compliance with such standards is found by the Administrator to be impracticable, he may authorize such changes in these standards as he finds will provide an equivalent level of safety.

41.24c ***Protective breathing equipment for the flight crew.***

(a) *Pressurized cabin airplanes.* Each flight crew member on flight deck duty shall have easily available at his station protective breathing equipment covering the eyes, nose, and mouth, or the nose and mouth where accessory equipment is provided to protect the eyes, to protect him from the effects of smoke, carbon dioxide, and other harmful gases.

(1) Not less than a 300-liter STPD supply of oxygen for each flight crew member on flight deck duty shall be provided for this purpose.

(b) *Nonpressurized cabin airplanes.* The requirement stated in paragraph (a) of this section shall apply to nonpressurized cabin airplanes, if the Administrator finds that it is possible to obtain a dangerous concentration of smoke, carbon dioxide, or other harmful gases in the flight crew compartments in any attitude of flight which might occur when the aircraft is flown in accordance with either the normal or emergency procedures approved by the Administrator.

41.24c–1 *Protective breathing equipment and installation (FAA policies which apply to sec. 41.24c).* Protective breathing equipment for the flight crew and its installation should comply with sections 4b.651–1 and 4b.651–2 of this subchapter.

(Published in 15 F.R. 8924, December 15, 1950, effective January 1, 1951.)

41.24c–2 *Requirement of protective breathing equipment in nonpressurized cabin airplanes (FAA rules which apply to sec. 41.24c(b)).* Protective breathing equipment for the flight crew shall be required in nonpressurized cabin aircraft having built-in carbon dioxide fire extinguisher systems in fuselage compartments (for example, cargo or combustion heater compartments); except that protective breathing equipment shall not be required where:

(a) Not more than 5 pounds of carbon dioxide will be discharged into any one such compartment in accordance with established fire control procedures, or

(b) The carbon dioxide concentration of the flight crew stations has been determined in accordance with section 4b.484–1 of this subchapter and found to be less than 3 percent by volume (corrected to standard sea level conditions).

(Published in 15 F.R. 8924, December 15, 1950, effective January 1, 1951.)

41.25 *Instruments and equipment required for continuance of flight.* If any required instrument or item of equipment in an aircraft becomes unserviceable in flight, a landing must be made at either the nearest suitable landing area or at the next point of intended landing whichever, in the opinion of the pilot, is the safer procedure, unless the equipment specified in this section for the type of operation indicated is in serviceable condition, in which case the flight may continue as scheduled to the nearest point where repairs or replacements can be made. The items listed in this section are required for all types of operation unless otherwise specified, except that the Administrator may permit or require different instrumentation or equipment for turbine-powered aircraft to provide equivalent safety:

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

(b) One approved compass,

(c) A tachometer for one engine, one fuel pressure gauge with warning indicator, one oil pressure gauge with warning indicator, and one oil temperature or cylinder temperature gauge for each engine,

(d) A manifold pressure gauge for one engine,

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

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

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

(h)

(1) Two of the following three units of radio equipment:

(i) One transmitter for two-way communication,

(ii) One receiver for two-way communication,

(iii) One receiver capable of receiving navigational signals.

(2) In addition to the instruments named in subparagraph (1) of this paragraph, one of the radio navigational systems required by section 41.21(b), if navigational facilities on the route are required by section 41.13,

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

(j) Forward position and tail lights, two landing lights, one set of instrument lights, and two class 1 or class 1A landing flares for night extended overwater operations.

(k) Fuel quantity indicators indicating the amount of fuel in each tank to be used for the remainder of the flight, or, in the case of aircraft having a third flight crew member assigned as a member of the operating crew, an alternate means approved by the Administrator for determining the amount of fuel in each tank (night and instrument operation),

(l) An electrically heated pitot tube serving each pilots air-speed indicator (night and instrument operation),

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

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

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

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

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

(r) After May 31, 1956, an approved anticollision light for aircraft having a maximum certificated weight of more than 12,500 pounds; 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 (Night),

(s) Effective July 1, 1956, a means shall be provided for each reversible propeller on airplanes equipped with reversible propellers, which will indicate to the pilots when the propeller is in reverse pitch. Such means may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch. No indication shall be given at or above the normal low pitch stop position. The source of indication shall be actuated by the propeller blade angle or be directly responsive to the propeller blade angle.

41.25–1 *Warning lights for reversible propellers (FAA policies which apply to sec. 41.25(s)).* 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.)

[*41.25a Flight recorders.*

[(a) An approved flight recorder which records at least time, altitude, airspeed, ver-

tical 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 41-34, published in 25 F.R. 6827, July 19, 1960, effective Aug. 18, 1960.)]

Limitations

41.26 *Airplane certification requirements.*

(a) *Airplanes certificated on or before June 30, 1942.* Airplanes certificated as a basic type on or before June 30, 1942, shall either:

(1) Retain their present airworthiness certification status and meet the requirements of section 41.36, or

(2) Comply with either the performance requirements of sections 4a.737–T through 4a.750–T of this subchapter or the performance requirements of sections 4b.110 through 4b.125 of this subchapter and in addition shall meet the requirements of section 41.27: *Provided,* That should any type be so qualified, all airplanes of any one operator of the same or related types shall be similarly qualified and operated.

(b) *Airplanes certificated after June 30, 1942.* Airplanes certificated as a basic type after June 30, 1942, and used in passenger operation shall be certificated as transport category airplanes and shall meet the requirements of section 41.27.

41.27 *Operating limitations upon airplanes certificated under transport category requirements.* When operating any airplane certificated in accordance with the provisions of Part 4b of this subchapter, or of sections 4a.737–T through 4a.750–T of this subchapter, the provisions of sections 41.28–41.35 shall apply unless deviations therefrom are specifically authorized by the Administrator when he finds that, due to a peculiarity of a specific case, such application is unnecessary for safety.

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

41.28 *General limitations.*

(a) Airplanes shall be operated only from airports at altitudes within the altitude range for which maximum take-off weights

have been determined and set forth in the airplane operating manual and shall be dispatched only to airports of intended destination, or to airports specified as alternates, which are at altitudes within the range for which maximum landing weights have been determined and set forth in the airplane operating manual.

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

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

(d) No airplane shall be taken off at a weight which exceeds the allowable weight for the runway being used as determined in accordance with the take-off runway limitations of the transport category operating rules, after taking into account the temperature operating correction factors required by section 4a.749a–T or section 4b.117 of this subchapter, and set forth in the Airplane Flight Manual for the airplane.

41.29 *Take-off limitations to provide for engine failure.* Take-off shall be made only from such airports, in such directions, and under such weight limitations that the following conditions are fulfilled as shown by the performance data determined under section 4a.747–T or section 4b.91 of this subchapter and set forth in the airplane operating manual:

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

(b) If the critical engine should fail at any instant after the airplane attains the critical-engine-failure speed, it shall be possible to proceed with the take-off and attain a height of 50 feet, as indicated by the take-off path data, before passing over the end of the take-off area. Thereafter it must be possible to clear all obstacles either by at least 50 feet vertically, as shown by the take-off path data, or by at least 200 feet horizontally within the airport boundaries and 300 feet horizontally after passing beyond such boundaries.

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

(c) In applying the requirements of paragraphs (a) and (b) of this section, corrections shall be made for any gradient of the take-off surface. To allow for wind effect, take-off data based on still air may be corrected by not more than 50 percent of the reported wind component along the take-off path if opposite to the direction of take-off, and shall be corrected by not less than 150 percent of the reported wind component if in the direction of take-off.

Note: All references in this section to sections of Part 4b of this subchapter are those sections in effect on October 1, 1949 (14 F.R. 4102, July 16, 1949).

41.30 *En route limitations.*

(a) *All airplanes; all engines operating.* Airplanes shall be dispatched only at such take-off weights that, in proceeding along the intended track with the weight of the airplane progressively reduced by the anticipated consumption of fuel and oil, the rate of climb with all engines operating (as set forth in the airplane operating manual), shall be, in feet per minute, 6 V_{s_0} at an altitude at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles of either side of the intended track; except that this requirement need not apply to airplanes certificated under the performance requirements of the regulations issued prior to November 9, 1945 (Part 4a of this subchapter).

(b) *All airplanes; one engine inoperative.*

(1) No airplane shall be taken off at a weight in excess of that which would permit

a rate of climb (expressed in feet per minute), with one engine inoperative, of at least $\left(0.06-\frac{0.08}{N}\right) V_{s_0}^2$ (when N is the number of engines installed and V_{s_0} is expressed in miles per hour) at an altitude of at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track, except that for transport category airplanes certificated under Part 4a of this subchapter, the rate of climb shall be $0.02\ V_{s_0}^2$.

(2) As an alternative to the provisions of subparagraph (1) of this paragraph, an air carrier may utilize an approved procedure whereby its airplanes are operated at an all-engine-operating altitude such that in the event of an engine failure the airplane can continue flight to an alternate airport where a landing can be made in accordance with the provisions of section 41.34, the flight path clearing all terrain and obstructions along the route within 5 miles on either side of the intended track by at least 2,000 feet. In addition, if such a procedure is utilized, subdivisions (i) through (vi) shall be complied with:

(i) The rate of climb (as presented in the Airplane Flight Manual for the appropriate weight and altitude) used in calculating the airplane's flight path shall be diminished by an amount, in feet per minute, equal to $\left(0.06-\frac{0.08}{N}\right) V_{s_0}^2$ (when N is the number of

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 pres-

[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 2(a).

ent reliability of 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 repre-

sentative 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.

Addendum

Preambles of Amendments to Civil Air Regulations Part 41

NOTE

Part 41 of the Civil Air Regulations was last revised by the Civil Aeronautics Board with an effective date of April 15, 1955. 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 April 19, 1955 (20 F.R. 2552).

566204 O - 60 - 2

Amendment 41–1

En Route Performance Operating Limitations

Adopted: May 9, 1955
Effective: May 9, 1955
Published: May 14, 1955
(20 F.R. 3295)

Currently effective section 41.30(b), 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 41.30(b).

Amendment 41–2

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

The current provisions of section 41.20 of Part 41 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 41.20 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 Regulations 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 41 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 41.120a 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 41.20(e) and added a new section 41.120a.

Amendment 41–3

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 41 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 41. 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 41 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 41.20(d) of Part 41 requires that multiengine airplanes be so equipped that engine rotation may be promptly stopped during 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 41.25 of Part 41 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 41.25. In view of the limited experience in air carrier operations 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 41.20(d) and the sentence immediately preceding the itemized list in section 41.25.

Amendment 41–4

Miscellaneous Amendments

Adopted: Aug. 22, 1955
Effective: Sept. 26, 1955
Published: Aug. 26, 1955 (20 F.R. 6246)

Currently effective section 41.52 of Part 41 of the Civil Air Regulations requires in part that a pilot in command or second in command, in order to maintain pilot technique in any aircraft of a particular type in which he is to serve in air transportation at night, shall have made at least one take-off and landing at night in that particular type of aircraft within the preceding ninety days. On the other hand, section 40.301 of Part 40, "Pilot recent experience," does not contain any requirement for night landings and take-offs within the preceding ninety days. Although section 40.282, "Initial pilot flight training," requires training for pilots in night operation in each type of airplane to be flown by them in sched-

uled operations. Part 41 contains only the generalization in section 41.53, "Periodic flight checks and instruction," that pilots in command must receive training under certain specified conditions and does not specifically require night operations. The Board has determined that the requirement for recent night landings is not essential to the safety of air carrier operations provided that adequate provision is made for night landings in the air carrier's initial pilot training program. Therefore, this amendment incorporates into Part 41 the basic provisions of sections 40.301 and 40.282 (a) of Part 40.

Currently effective Part 41 does not contain any provisions such as those in Part 40 which permit a scheduled domestic air carrier under specified conditions to conduct over-the-top operations by day below the established minimum en route altitude, and which permit such an air carrier to make an entry into an instrument approach procedure below the altitude specified by the Administrator for such procedure. At the time this provision was incorporated into Part 40 by amendment, it did not appear necessary that it also be included in Part 41. However, it has since become apparent that such a provision can appropriately be utilized in Part 41 operations. Accordingly, this amendment incorporates into Part 41 provisions similar to those currently contained in Part 40.

In addition, an erroneous reference in section 41.34 is corrected by deleting the reference to section 41.35 and inserting in lieu thereof the reference section 41.33.

The foregoing amendments were the subject of a notice of proposed rule making (19 F.R. 5645) which was circulated to interested persons as Draft Release No. 54–20. This draft release also contained certain proposals relating to aircraft dispatcher daily duty time limitations, instrument approach procedures, and approach and landing limitations. Final disposition of these latter proposals is not being made at this time but will be the subject of separate rule making actions at a later date.

The Board has under development a complete revision of the format of Part 41. In the course of this revision it is intended that consideration be given to many substantive issues covering the international air carrier certification and operating rules which have been raised in recent years. However, the Board has determined that justification exists for proceeding with the amendments described herein at this time.

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 changed reference to section 41.35 to 41.33 in section 41.34, revised sections 41.52 and 41.117, and changed the title of paragraph (b) and added a new paragraph (c) to section 41.114.

Amendment 41–5

Propeller Reverse Pitch Indicators

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

Currently effective section 41.25(s) of Part 41 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 41.25(s) 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 41.25(s).

Amendment 41-6

Emergency and Evacuation Equipment and Procedures	Adopted:	Nov. 28, 1955
	Effective:	Nov. 28, 1955
	Published:	Dec. 2, 1955 (20 F.R. 8850)

Currently effective provisions of Part 41 of the Civil Air Regulations contain certain requirements for emergency and evacuation equipment and procedures. This amendment requires air carriers operating pursuant to Part 41 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 41 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.* At the present time Part 41 requires that emergency exits for airplanes carrying passengers be clearly marked as such with luminous paint in letters not less than ¾ inches high, such markings to be located either on or immediately adjacent to pertinent exits and readily visible to passengers. Location and method of operation of the handles are required to be marked with luminous paint. The Board does not consider that these requirements are adequate to ensure that in case of a crash landing or ditching at night the passengers and crew would be able to identify and operate emergency exits. This amendment, therefore, provides that for all air carrier passenger airplanes lights be installed so as to illuminate all emergency exits in such a manner as to attract the attention of the occupants of the airplane at night. 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 scheduled 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 opera-

tions. 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 procedures 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 revised section 41.23 and added new sections 41.23b, 41.23c, and 41.23d; revised sections 41.126 and 41.127; and added the definition "Extended overwater operation" to section 41.137.

Amendment 41–7

Emergency and Evacuation Equipment and Procedures	Adopted: Jan. 17, 1956 Effective: Jan. 17, 1956 Published: Jan. 24, 1956 (21 F.R. 513)

In a notice of proposed rule making published in the Federal Register (20 F.R. 1016) and circulated as Civil Air Regulations Draft Release No. 55–5, dated February 10, 1955, it was proposed to amend section 41.127 of Part 41 of the Civil Air Regulations to provide for the briefing of passengers on air carrier aircraft engaged in extended overwater operations. Among other things, it was specifically proposed to require that where the airplane proceeds directly over water after take-off, the briefing on location of the life vests and emergency exits be accomplished prior to take-off. Following an analysis of comment received in response to these proposals, the Board, on November 28, 1955, adopted Amendment 41–6, which amended section 41.127 to provide for the briefing of passengers on air carrier aircraft engaged in extended overwater operations. However, that part of the briefing procedures to be accomplished prior to take-off, where the airplane proceeds directly over water after take-off, was inadvertently omitted at the time of adoption. This amendment corrects this oversight.

Since the substance of this amendment is the same as that which was published in the Federal Register (20 F.R. 1016) as a notice of proposed rule making, the Board finds that additional notice and public procedure hereon are unnecessary. Since this amendment need not be complied with for at least 6 months, it may be made effective immediately.

Amendment revised section 41.127.

Amendment 41–8

Daily Flight Time Limitations for Flight Navigators	Adopted: Mar. 21, 1956 Effective: Apr. 25, 1956 Published: Mar. 27, 1956 (21 F.R. 1847)

Part 41 of the Civil Air Regulations presently limits the time a pilot, flight radio operator, or flight engineer may be scheduled for flight duty to a maximum of 12 hours during any 24 consecutive hours when no in-flight relief is available for such flight crew member. However, Part 41 does not contain such a limitation with respect to the scheduling of a flight navigator for flight duty.

On April 22, 1955, the Bureau of Safety Regulation circulated Civil Air Regulations Draft Release No. 55–10, Flight Time Limitations; Navigators, and published a notice of proposed rule making in the Federal Register on April 27, 1955, (20 F.R. 2822) in which notice was given that it had under consideration the adoption of an amendment to Part 41 of the Civil Air Regulations to limit the time a flight navigator may be scheduled for flight duty to a maximum of 12 hours during any 24 consecutive hours when no in-flight relief is available. Comment received from the principal interested parties revealed that considerable disagreement existed with respect to the proposal. In addition, the Board also received a request that it hear oral argument before taking final action on the proposal.

Accordingly, the Board, on November 30, 1955, published a Supplemental Notice of Proposed Rule Making and Oral Argument Thereon (20 F.R. 8777) which was circulated as Draft Release No. 55–28. In that notice the Board requested that persons desiring to be heard inform the Director of the Bureau of Safety Regulation on those matters set forth in the notice concerning which they desired to present oral argument and to submit a brief statement containing the nature of the argument to be presented.

Following circulation of Draft Release No. 55–28, the only person having a substantial interest in this matter who requested opportunity to present oral argument before the

Board withdrew his request with the understanding that the flight time limitation proposed in Draft Release No. 55–10 would be made applicable only on those routes or route segments on which it has been determined that flight navigators are required pursuant to section 41.80. Inasmuch as this understanding was consistent with the Board's interpretation of similar requirements with respect to other airmen similarly affected, and since it was consistent with the proposal contained in Draft Release No. 55–10, the Board was of the view that no useful purpose would be served by hearing oral argument in this matter.

In view of the foregoing, the Board found that good cause existed for canceling the oral argument. Accordingly, interested persons were notified by published notice (21 F.R. 630) circulated as Draft Release No. 56–4 that the oral argument had been canceled.

In consideration of all the information available, including comment submitted with respect to Draft Releases Nos. 55–10 and 55–28, the Board finds that, although an airman's being in the air for more than 12 hours does not create a hazardous condition in and of itself, in the interest of safety 12 hours should be the maximum period for any flight crew member, including navigators, to be scheduled for flight duty on an aircraft as a flight crew member without in-flight relief; that Part 41 does not presently contain such a limitation; that the navigator flight time limitations of Part 41 are applicable only over those areas, routes, or route segments for which it has been determined that flight navigators are required by section 41.80; and that current route patterns are such that no undue hardship will be imposed on any United States flag carrier by application of the 12-hour limitation on navigator flight duty.

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 41.81.

Amendment 41–9

Training Programs and Proficiency Checks—Use of Aircraft Simulators	Adopted: Feb. 8, 1957 Effective: Mar. 15, 1957 Published: Feb. 13, 1957 (22 F.R. 887)

Part 41 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 pilots'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 revised section 41.53 by designating the existing paragraph as paragraph (a) and adding a new paragraph (b).

Amendment 41–10

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. 3917)

Provisions of Part 41 of the Civil Air Regulations, adopted November 28, 1955, (20 F.R. 8850) 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 41 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 41 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 41.23d (a) and (b)(2).

Amendment 41–11

Admission to Flight Deck

Adopted: July 11, 1957
Effective: Aug. 15, 1957
Published: July 16, 1957
(22 F.R. 5572)

Section 41.121 of Part 41 of the Civil Air Regulations specifies the persons who may be admitted to the flight deck of an air carrier aircraft. Although it was the intention of the Board to limit admission to such flight deck to the persons specified in this section, it has come to the attention of the Board that there is ambiguity as to whether other persons not expressly authorized to be admitted to the flight deck are prohibited from admission thereto. This amendment eliminates this ambiguity.

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 41.121 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 understood 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 42 of the Civil Air Regulations which pertain to admission to the flight deck.

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 41.121.

Amendment 41–12

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 new paragraph (t) to section 41.25.

Amendment 41–13

Interior Emergency Exit Marking Lights

Adopted: Aug. 9, 1957
Effective: Aug. 9, 1957
Published: Aug. 15, 1957 (22 F.R. 6568)

Currently effective section 41.23d(b)(2) of Part 41 of the Civil Air Regulations requires that, on all airplanes used for scheduled air carrier operations outside the continental limits of the United States 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 airplanes. It was the Board's intention that through this amendment all passenger-carrying airplanes 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 airplanes 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 airplanes whether engaged in passenger or cargo operations under Part 41.

The Board has been requested to clarify its intent with respect to this provision insofar as its applicability to airplanes 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 airplanes. 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 airplane. 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 facilties for the emergency exits.

In view of the foregoing, section 41.23d(b)(2) is being amended to reflect the intent of the Board that the emergency lighting requirements apply only to passenger-carrying airplanes.

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 added the words "in all passenger-carrying airplanes" after the words "August 31, 1957" in section 41.23d(b)(2).

Amendment 41–14

Elimination of the Requirement in Periodic Flight Check and Instruction for Simulated Maximum Authorized Weight Conditions for Take-Off with One Engine Inoperative

Adopted: Oct. 17, 1957
Effective: Nov. 21, 1957
Published: Oct. 23, 1957 (22 F.R. 8304)

By virtue of presently effective Civil Air Regulations, a pilot who is to serve as a pilot in command must pass, periodically, a proficiency check in airplanes that he flies. This check flight includes a demonstration of the ability to complete a take-off at maximum take-off weight with the critical engine inoperative, a requirement which the Board has found to be no longer practical for the periodic checks.

In the large modern transport airplane a great difference exists between maximum certificated take-off weight and maximum certificated landing weight. If such an airplane is flown at maximum weight for a check flight, it must be loaded with large quantities of fuel or ballast. Then, if the flight is to be terminated within a reasonable time, fuel, ballast, or both must be dumped so as to reduce the weight to that permitted for landing.

To avoid the obvious disadvantages of the above, the Board by regulation has permitted maximum take-off weight to be simulated. This has been done by reducing take-off power, or by limiting take-off distance to the minimum required for the weight at which the airplane is being operated. Neither procedure has been fully satisfactory. Time-consuming calculations and special runway markings are required, and even with these devices the maximum take-off weight condition to be simulated cannot be fully represented. Further-

566204 O - 60 - 3

more, use of reduced power settings for take-offs has been opposed by engine manufacturers who contend that the practice is injurious to the powerplants, and by supervisory training personnel who state that the practice encourages non-standard and improper use of the powerplant controls and induces an additional hazard to flight. It appears, therefore, that the requirement for an actual or simulated take-off at maximum certificated weight with one engine inoperative should not be continued as a regulatory requirement in the periodic proficiency check. It should be understood, however, that this amendment will not affect the present requirements in initial pilot flight training for simulation of engine failure at actual or simulated maximum weights in take-off, landing, and approach configurations.

Interested persons have been afforded an opportunity to participate in the making of this amendment (22 F.R. 522), and due consideration has been given to all relevant matter presented.

Amendment added a provisio at the end of the fourth sentence of section 41.53(a).

Amendment 41–15

Landing Flare Requirements

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

Part 41 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 varied. 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 carrier 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. Furthermore, 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 wth only a short operating range, when most airports or landing areas were unlighted, and the general reliability of aircraft was considerably less than 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 41.25(j).

Amendment 41–16

Requirements Covering Landing Limitations Within the Continental United States	Adopted: Mar. 3, 1958 Effective: Mar. 3, 1958 Published: Mar. 7, 1958 (23 F.R. 1621)

Currently effective section 41.119 of Part 41 of the Civil Air Regulations prohibits an instrument approach from being executed or a landing being made if the latest U.S. Weather Bureau weather report for the airport concerned indicates the ceiling or visibility to be less than that prescribed by the Administrator for landing at such airport, unless the prescribed weather conditions exist when the approach is initiated and subsequently are reported below minimums when the aircraft is on final approach. Thus, United States flag carriers operating pursuant to this part may not initiate instrument approaches at domestic

airports if the reported weather is below the authorized minimums. Part 40, on the other hand, permits pilots to execute an instrument approach procedure at domestic airports under the stated conditions if the airport is served by ILS and PAR in operative condition and both are used by the pilot. A subsequent landing is permitted if, upon reaching the minimum landing altitude, the pilot finds the weather to be equal to or better than the approved minimums.

There is no apparent reason why United States air carriers, whether operating pursuant to Part 40 or Part 41, should be subject to different requirements when approaching or landing at an airport within the continental limits of the United States. There has been no indication that the "look-see" authorization has had any adverse effect on the safety of operations conducted under Part 40. Conversely, there is reason to believe that an operational penalty may be incurred by United States flag carriers at the domestic terminal of an international flight because of the present provisions of section 41.119. In order to correct this situation, section 41.119 is being amended to permit pilots to exercise the same privileges in connection with approaches and landings as are available to pilots flying in accordance with Part 40. No other substantive change is made to presently effective section 41.119, although the format is different.

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 made effective without prior notice.

Amendment revised section 41.119.

Amendment 41–17

Amendments Resulting from the 1957 Annual Airworthiness Review

Adopted: Apr. 15, 1958
Effective: May 17, 1958
Published: Apr. 19, 1958 (23 F.R. 2595)

The Board has been advised that the descent flight provision of the two-engine-inoperative en route requirement of Part 41 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 41.30(c)(2)(ii) 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 requirement 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 41.

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 41.23d(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 41.30(c)(2)(ii).

Amendment 41–18

Supplemental Oxygen Requirements for Sustenance and First Aid

Adopted: Aug. 27, 1958
Effective: Sept. 1, 1958
Published: Aug. 30, 1958 (23 F.R. 6746)

Part 41 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 characteritsics 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 altitude 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

566204 O - 60 - 4

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. 9229), 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 titles of sections 41.24 and 41.24a, added new sections 41.24–T and 41.24a–T, and revised section 41.24b.

Amendment 41–19

Pilot Route and Airport Qualification Requirements	Adopted:	Sept. 16, 1958
	Effective:	Sept. 24, 1958
	Published:	Sept. 20, 1958 (23 F.R. 7341)

Section 41.50 of Part 41 of the Civil Air Regulations provides, in part, that a pilot in qualifying over a route shall make at least one round trip or two one-way trips over the route, including a familiarization flight at each regular, provisional, or refueling airport, with one of the air carrier's check pilots. Section 41.51 governs the maintenance and re-establishment of route qualifications and requires compliance under certain circumstances with the provisions of section 41.50 by the pilot in command.

On January 20, 1955, the Bureau of Safety circulated Civil Air Regulations Draft Release No. 55–3 (20 F.R. 550) which dealt with the over-all problem of pilot airport and route qualification. Attention was drawn to the development of motion picture panoramic views of airports and their environs which showed excellent promise of providing an effective means for attaining pilot airport qualification in lieu of actual entry. An objective in this proposal was to amend the regulations in a manner that would encourage further research and development of the visual training aids programs by various commercial sources and at the same time provide more acceptable airport qualification rules for use in the meantime. Furthermore, it seemed appropriate to permit methods of airport qualification other than physical entry, provided that such alternative methods had the approval of the Administrator.

Following circulation of Draft Release 55–3 for comment, the Board promulgated a series of Special Civil Air Regulations (SR–413, SR–414, SR–418, and SR–418A) to permit the controlled introduction of new techniques in airport and route qualification. These techniques included the use of pictorial means within the training program which would enable pilots to qualify at specified airports by using color motion pictures or slides showing clear daylight views of the complete physical layouts of the airports, surrounding terrain, obstructions, approaches to all runways, restricted areas, and conspicuous reference points that are of value to pilots. Under these special regulations air carriers were also authorized to conduct operations at an airport in close proximity to an airport into which pilots were qualified when the Administrator found that such pilots were adequately qualified at the new airport. In making such findings, the Administrator took into consideration such things as the familiarity of the pilots with the layout, surrounding terrain, location of obstacles, and instrument approach and traffic control procedures at the new airport. In addition, under SR–418 and SR–418A, a pilot was expressly permitted to accomplish initial qualification into an airport without being accompanied by a pilot qualified at that airport if such initial entry were made under VFR weather conditions at the particular airport involved.

One of the principal purposes of these special regulations has been to provide sufficient opportunity for evaluation of pictorial means of airport and route qualification by industry and Government alike in order to guide the Board in its final action in amending the Civil Air Regulations. Experience gained under these special regulations up to the time of the adoption of SR–418A indicated that the various procedures provided therein for airport and route qualification, including pictorial means, had been successful. Therefore, the Board stated in the preamble to SR–418A that prior to the termination of that regulation, a proposal to incorporate its substance into Part 41 would be circulated for comment. Accordingly, the Board circulated Draft Release 58–13 to obtain comments as to the continued effectiveness and extent of use of the privileges of SR–418A and any other recommendations with respect to incorporation of the provisions of that regulation in Part 41 of the Civil Air Regulations.

In view of the wide acceptance of this means of qualification and in the absence of any contrary view, the Board believes it desirable to include the substance of the special regulations in Part 41 of the Civil Air Regulations as proposed. The provisions contained in SR–418A concerning route qualification on those routes on which navigation must be accomplished by pilotage and on which the flight is to be conducted at or below the level of adjacent terrain also are being added to Part 41 by this amendment.

Interested persons have been afforded an opportunity to participate in the making of this amendment (23 F.R. 5356), 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 on less than 30 days' notice.

Amendment revised sections 41.50 and 41.51.

Amendment 41–20

Required Records

Adopted: Oct. 1, 1958
Effective: Nov. 5, 1958
Published: Oct. 7, 1958
(23 F.R. 7723)

A notice of proposed rule making was published in the Federal Register March 13, 1958, (23 F.R. 1737) and circulated to the industry as Economic Regulations Draft Release No. 92 dated March 7, 1958, which proposed to bring up to date record requirements of Part 41 of the Civil Air Regulations and make them consistent wth corresponding record retention provisions in Part 249 of the Economic Regulations.

Accordingly, concurrently with the amendment of Part 249, the record provisions of Part 41 are being amended to delete the obsolete provisions of section 41.133 and to insert in lieu thereof a provision to require records of radio contacts by or with pilots en route to be maintained. Consistent with the retention period prescribed in Part 249 for such records, it is provided that they shall be retained for a period of 30 days. In addition, the provisions of section 41.99 are being amended to reduce the retention period for maintenance releases from "90 days" to "2 months" and to substitute the words "3 months" for "90 days" with respect to clearances and manifests. These amendments will bring the retention provisions in section 41.99 into accord with the corresponding provisions of Part 249.

The foregoing record requirements are considered necessary to enable the Board and the Administrator to discharge fully their respective accident investigation and safety regulatory responsibilities.

Interested persons have been afforded an opportunity to participate in the making of this regulation (23 F.R. 1737), and due consideration has been given to all relevant matter presented.

Amendment revised sections 41.99 and 41.133.

Amendment 41-21

Use of Average, Assumed, and Estimated Weights

Adopted: Dec. 30, 1958
Effective: Dec. 30, 1958
Published: Jan. 3, 1959
(24 F.R. 50)

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 41. These procedures and the recommended methods of implementation described in Civil Aeronautics Manual 41 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 41 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 41. 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 will be 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 41. 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 standard 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 41 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 41 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 paragraph (f) to section 41.20.

Amendment 41–22

Scheduled United States-Alaska and Intra-Alaska Operations

Adopted: Jan. 2, 1959
Effective: Jan. 3, 1959
Published: Jan. 8, 1959 (24 F.R. 201)

By virtue of the provisions of the Alaska Statehood Act (P.L. 85–508, 72 Stat. 339), adopted on July 7, 1958, the former Territory of Alaska will be admitted into the Federal Union upon the issuance of the Presidential Proclamation contemplated by section 8(c) of that Act. Accordingly, it is necessary to amend section 41.0 of the Civil Air Regulations in order to insure that the provision of scheduled air services between the 48 states on the Continental mainland, and the new State of Alaska as well as the provision of such service to pairs of points within the boundaries of the new state will continue to be governed by the safety regulatory provisions of Part 41.

Since the provisions of Part 41 are presently applicable to such operations, the amendment does not impose any additional burden upon any person and is purely technical in nature. For these reasons, the Administrator finds that compliance with the notice, public participation and effective date provisions of section 4 of the Administrative Procedure Act is unnecessary.

Amendment added sentence at the end of section 41.0 and changed "Territory of Alaska" to "State of Alaska" in section 41.1(a).

Amendment 41–23

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 41.62 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 41.62 are therefore being amended by a new section 41.134 to clarify their intention and application. Since the present section refers only to pilots, the new section will also be made applicable to other flight crew members. The present section 41.62 does not expressly require that flight crew members keep their seat belts fastened when at their respective stations, and this provision is being included in the new section. In addition, section 41.62 presently permits the absence of a pilot from his seat when he is replaced by a person "authorized" by section 41.121. It is to be

noted that section 41.121 regulates only 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 41.62 are being amended as indicated above. Amendments to the same effect are simultaneously being made to Parts 40, 42, 46 and 60 of the Civil Air Regulations to provide identical rules for all operations covered by those parts.

The same changes in substantially the same language were previously proposed by the Civil Aeronautics Board, in connection with a revision of Part 41 presently under consideration, as section 41.354 of the revision. Notice of the proposed revision was published in the Federal Register on January 7, 1959 (24 F.R. 145), and distributed as Draft Release 58–24. The changes being made to the proposal contained in the Draft Release constitute a clarification and are minor in nature. Although the time for the receipt of comments to Draft Release 58–24 was recently extended to June 1, 1959 (24 F.R. 2500), I find that the provisions of section 41.354 of the Draft Release being incorporated in this amendment are essential for uniform and safe operating procedures; that further delay in the adoption of these provisions would be contrary to the public interest; and that good cause exists to make the amendment effective on less than 30 days' notice in accordance with the provisions of section 4 of the Administrative Procedure Act.

Amendment rescinded section 41.62 and added a new section 41.134.

Amendment 41–24

Scheduled United States-Hawaii and Intra-Hawaii Operations	Adopted:	June 25, 1959
	Effective:	Aug. 21, 1959
	Published:	July 3, 1959 (24 F.R. 5415)

By virtue of the provisions of the Hawaii Statehood Act (Pub. Law 86-3, 73 Stat. 4), adopted on March 18, 1959, the former Territory of Hawaii will be admitted into the Federal Union upon the issuance of the Presidential Proclamation contemplated by section 7(c) of that Act. Accordingly, it is necessary to amend section 41.0 of the Civil Air Regulations so that the provision of scheduled air transportation between the other 49 states, and the new State of Hawaii, as well as the provision of scheduled air service by common carriers, other than air taxi operators, to pairs of points within the boundaries of the new state may continue to be governed by the safety regulatory provisions of Part 41.

Since the provisions of Part 41 are presently applicable to such operations, the amendment does not impose any additional burden upon any person. Consequently, the Administrator finds that compliance with the notice, public participation and effective date provisions of section 4 of the Administrative Procedure Act is unnecessary.

Amendment revised section 41.0.

Amendment 41–25

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. 6240)

Currently effective sections 41.24–T(a), 41.24 a–T(a), and 41.24b(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 full 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 41.24–T(a) and 41.24b(b), and revised the first sentence of section 41.24a–T(a).

Amendment 41–26

Frequency of Pilot Proficiency and Line Checks	Adopted:	Sept. 24, 1959
	Effective:	Oct. 29, 1959
	Published:	Sept. 30, 1959 (24 F.R. 7865)

Part 41 of the Civil Air Regulations presently requires each pilot in command to successfully pass a technique check (proficiency check) at least twice each year at intervals of not less than 4 months.

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.

In addition, Part 41 requires the pilot in command to pass a route competency check (line check) twice each year, whereas only one such check is required for domestic operations. Experience has shown that only one line check is necessary, hence Part 41 is being amended to delete one line check each year.

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

Amendment revised section 41.53 (a) and (b).

Amendment 41–27

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 41.25(t) 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 the 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 41.25(t) requires that the flight recorders "shall be operating continuously during flight time." It was the intent 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 41.25(t) is being amended to clarify these matters. Similar amendments are being made concurrently to Parts 40 and 42 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 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 41.25(t).

Amendment 41–28

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 41.53h Published: Dec. 5, 1959 (24 F.R. 9768)

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

Amendment 41–29

Maximum Age Limitations for Pilots

Adopted: Dec. 1, 1959
Effective: Mar. 15, 1960
Published: Dec. 5, 1959 (24 F.R. 9772)

Notice was given in Draft Release 59–5 (24 F.R. 5248) 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 air-carrier 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 progresssive 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 older 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 increases yet to occur. Projection of the number of pilots who will be in the 60 to 70 age group, in an era of extreme density and frequency of jet and piston air carrier operations involving many millions of passengers 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 reoccurrence 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 air carriers, was in favor of the proposal as to age 60. The Air Line Pilots Association, from which most complete and voluminous comments were received, was opposed to all 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 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.

Amendment added a new paragraph (e) to section 41.48.

Amendment 41–30

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 41.24a–T(a) provides that on and after November 30, 1959, turbine-powered airplanes with pressurized cabins shall comply with the provisions of section 41.24a–T. Section 41.24a–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 Administrator has received information to the effect that this requirement is not necessary to achieve the highest degree of safety in air transportation and it is claimed that compliance with this regulation may detract from the required crew coordination and adversely affect 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 41.24a–T(c).

Amendment 41–31

Drinking and Serving of Alcoholic Beverages

Adopted: Jan. 6, 1960
Effective: Mar. 10, 1960
Published: Jan. 9, 1960
(25 F.R. 169)

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 41 by adding a new section 41.135 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 interpret 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 41.135.

Amendment 41–32

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. 798)

Currently effective § 41.24a–T 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 41.24a–T(c).

Amendment 41–33

Frequency of Pilot Line Checks

Adopted: Apr. 27, 1960
Effective: June 1, 1960
Published: May 4, 1960
(25 F.R. 3850)

Section 41.53j(a) of the Civil Air Regulations presently requires in part that a pilot shall satisfactorily accomplish a line check prior to serving as pilot in command and at least once each 12 months thereafter. This has normally been termed within the industry as the annual or yearly line check for the pilot in command.

By letter dated February 9, 1960, the Air Transport Association of America, on behalf of its member air carriers, recommended that the time interval between line checks be specified in the same manner as Civil Air Regulations Amendments 40–19 and 41–26, which clarified the time intervals between proficiency checks. The ATA advises that such a clarification will simplify recordkeeping and administration of the line check in the same way that the proficiency check requirements have been simplified.

The FAA has considered the foregoing recommendation and believes that the requirements with respect to the frequency of pilot line checks should be amended to provide the clarification requested and to make such requirements consistent with the frequency requirements for pilot proficiency checks.

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

Amendment revised section 41.53j by adding two new sentences after the first sentence.
Note: Section 41.53j will be found in Amendment 41–28 contained in appendix B to this manual.

Amendment 41-34

Installation of Flight Recorders on Turbine-Powered Airplanes

Adopted: July 12, 1960
Effective: Aug. 18, 1960
Published: July 19, 1960 (25 F.R. 6827)

The Federal Aviation Agency published a notice of proposed rule making 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.

The Air Transport Association, on behalf of the scheduled air carriers, raised specific objections to the proposed effective date of September 1, 1960. The airline stated that the date prescribed could only be met by removing airplanes from service to complete the required installations. This, they affirmed, would impose unreasonable interruptions of schedules and add undue burdens of additional expense. Further, it was stated that some air carriers may desire to equip their airplanes with a more sophiscated type of recorder capable of recording additional parameters of information which would be of value to their operations and maintenance, as well as for incident and accident investigation purposes. The currently required parameters are time, heading, airspeed, altitude and vertical acceleration.

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 investigation 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.

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 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.

After consideration of all the comments received, and upon further investigation thereof, the Agency has concluded that a longer period of time should be authorized for compliance with this regulation as it applies to turbine-propeller powered airplanes. Turbojet airplanes, since they are certificated for operation above 25,000 feet, 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-propeller powered airplanes 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 FAA, 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-powered 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.

Certain air carriers requested that the Fairchild F–27 airplane be specifically exempted from the requirements of this rule in view of the geographic areas in which they are operated or in consideration of the varied local service or low altitude types of operations in which they are engaged. The FAA, in its notice of proposed rule making, explained that it was proposing this regulation specifically to encompass all of the new 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 F–27 is a modern turbine-powered transport type airplane and is capable of operating at high speeds. For these reasons, the Agency is convinced that all large turbine-powered airplanes should be equipped with flight recorders. Accordingly, the rules adopted herein make no exception for the F–27 airplane.

This amendment also clarifies the Agency's intent to require continuous operation of the flight recorder from the instant the aircraft 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 section 41.25(t) and added a new section 41.25a.

U.S. GOVERNMENT PRINTING OFFICE: 1960 O - 566204