Federal Aviation Agency

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Civil Aeronautics Manual 42

Irregular Air Carrier and Off-Route Rules

Supplement No. 2, CAM 42 dated Feb. 15, 1960 — March 15, 1961

SUBJECT: Revisions to CAM 42.

This supplement is issued to incorporate into CAM 42 Civil Air Regulations Amendments 42–23, 42–30, 42–31, and Special Civil Air Regulation No. SR–399C which supersedes Special Civil Air Regulation No. SR–399B. This supplement also deletes Special Civil Air Regulation No. SR–429 which terminated February 2, 1961.

Amendment 42–23, concerning air carrier training programs and the qualification of and proficiency checks for pilots other than pilots in command, is now contained in CAM 42 as appendix C as it did not become effective until January 1, 1961. Now that it is effective, the changes have been incorporated in the text and appendix C is being deleted.

Amendment 42–30 concerns recent flight experience requirements for flight crewmembers. It was issued on December 30, 1960, and became effective January 1, 1961.

Amendment 42–31 concerns oxygen mask requirements and altitude training for flight crewmembers assigned to duty on turbine-powered airplanes operated above 25,000 feet. It was issued on January 19, 1961, to become effective on March 3, 1961.

New or revised material is enclosed in black brackets on the pages submitted with this supplement except Special Civil Air Regulation No. SR–399C which is new in its entirety, and the pages to be inserted in the addendum which contain the preambles of amendments 42–23, 42–30, and 42–31.

Remove the following pages:	*Insert the following new pages:*
V through VIII	V through VIII
3 and 4	3 through 4–1
23 and 24	23 through 24–1
36–1 through 38	37 through 38–2
43 through 46	43 through 46– 3
133 and 134	133 and 134
223 through 226	223
241 through 251	–
P–23 and P–24	P–23 through P–24–3
P–31 and P–32	P–31 through P–35

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ATTACHMENTS.

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Maintenance Requirements

Flight Crew Requirements

Flight Operation Rules

Operating Limitations For Large Passenger-Carrying Airplanes

Required Records And Reports

Appendixes

Addendum

of the United States through the airspace over any place outside thereof; places in the same Territory or possession of the United States, or the District of Columbia; a place in any State of the United States, or the District of Columbia, and any place in a Territory or possession of the United States, and a place in any other Territory or possession of the United States; a place in the United States and any place outside thereof; or the carriage of mail by aircraft.

Alaskan air carrier. Alaskan air carrier includes any air carrier subject to the provisions of Part 292 [1] of this chapter as heretofore or hereafter amended.

[1] Part 292 currently provides that Alaskan air carriers shall include certificated and noncertificated air carriers engaging solely in air transportion within the State of Alaska.

Alternate airport. An alternate airport is one listed in the flight plan as a point to which a flight may be directed if, subsequent to departure, a landing at the point of intended destination becomes inadvisable.

Approach or takeoff area. The approach or takeoff area shall be an area symmetrical about a line coinciding with and prolonging the center line of the runway, or the most probable landing or takeoff path for instrument approaches where there is a multiplicity of parallel runways, or a large hard-surfaced area continuously available for landing or takeoff. This area shall be assumed to extend longitudinally in a straight line from the intersection of the obstruction clearance line with the runway to the most remote obstacle touched by the obstruction clearance line and in no case less than 1,500 feet. Thence, it shall be assumed to continue in a path consistent with the instrument approach or takeoff procedures for the runway in question or, where such procedures are not specified, consistent with turns of at least 4,000 feet in radius. It shall be further assumed to extend laterally at the point of intersection of the obstruction clearance line with the runway 200 feet on each side of such center line. This distance shall increase uniformly to 500 feet on each side of such center line at a longitudinal distance of 1,500 feet from such point of intersection. Thereafter, this distance shall be assumed to be 500 feet on each side of such center line.

Approved. Approved, when used either alone or as modifying other words such as "means," "method," "action," etc., shall mean approved by the Administrator.

Check pilot. Check pilot is a pilot authorized by the Administrator to check pilots of the air carrier for such items as familiarity with en route procedures and piloting technique.

Crewmember. Crewmember means any individual assigned by the air carrier for the performance of duty on the aircraft in flight.

Critical engine. The critical engine is the engine the failure of which gives the most adverse effect on the performance characteristics of the aircraft. (See the airworthiness requirements under which the airplane was type certificated for the manner in which such engine is determined.)

Critical-engine-failure speed. The critical-engine-failure speed is a true indicated air speed, selected by the aircraft manufacturer, at which the takeoff may be safely continued even though the critical engine becomes suddenly inoperative. (See the airworthiness requirements under which the airplane was type certificated for the manner in which such speed is determined.)

Critical point of takeoff. The critical point of takeoff is that point beyond which the aircraft cannot be brought to a safe stop in the event of failure of the critical engine. (See the airworthiness requirements under which the airplane was type certificated for the manner in which such point is determined.)

Effective length of runway. The effective length of runway is the distance from the point where the obstruction clearance line intersects the runway to the far end thereof.

Exclusive use of aircraft. Exclusive use of an aircraft means that an air carrier has the sole possession, control, and use of an aircraft for flight arising from either (i) a lease or other agreement or arrangement under which the air carrier is to have the right to such possession, control, and use for a period of at least six consecutive months from the date of such lease or other agreement or arrangement,[2] or (ii) ownership of the aircraft.

[2] Attention is invited to the provisions of sec. 408 of the Federal Aviation Act of 1958, as amended (72 Stat. 767, 49 U.S.C. 1378) which, in certain cases, regulates sales, leases of, or contracts for use of aircraft between air carriers, or other persons engaged in any phase of aeronautics, and

which may require that prior Civil Aeronautics Board approval of such arrangements be obtained. Attention is further invited to the fact that aircraft leased from United States Government agencies may not ordinarily be subleased without prior approval of the lessor.

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

Flight crewmember. Flight crewmember means a pilot, flight radio operator, flight engineer, or flight navigator assigned to flight duty on the aircraft.

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

IFR. The symbol used to designate instrument flight rules.

Irregular air carrier. Irregular air carrier includes any air carrier subject to the provisions of Part 291 of this chapter as heretofore or hereafter amended.

Large aircraft. Aircraft of 12,500 pounds or more maximum certificated takeoff weight shall be considered large aircraft.

Maximum certificated takeoff weight. Maximum certificated takeoff weight shall mean the maximum takeoff weight authorized by the terms of the aircraft airworthiness certificate.[3]

[3] Note that the aircraft airworthiness certificate incorporates as a part thereof an airplane operating record or an airplane flight manual which contains the pertinent limitation.

Minimum control speed. The minimum control speed is the minimum speed at which the airplane can be maintained in straight flight after an engine suddenly becomes inoperative. (See the airworthiness requirements under which the airplane was type certificated for the manner in which such speed is determined.)

Night. Night is the time between the ending of evening twilight and the beginning of morning twilight as published in the Nautical Almanac converted to local time for the locality concerned.[4]

[4] The Nautical Almanac containing the ending of evening twilight and the beginning of morning twilight tables may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Information is also available concerning such tables in FAA Airport Traffic Control Towers and Communications Stations or the United States Weather Bureau.

Obstruction clearance line. The obstruction clearance line is a line drawn tangent to or clearing all obstructions showing in a profile of the approach or takeoff area which has a slope to the horizontal of 1/20.

Passenger-carrying aircraft. An aircraft carrying any individual other than a flight crew or crewmember, company employee, or an authorized Government representative shall be considered a passenger-carrying aircraft.

Pilot compartment. Pilot compartment means that part of the aircraft designed for the use of the flight crew.

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

Point-of-no-return. Point-of-no-return means the point beyond which the aircraft no longer has sufficient fuel, under existing conditions, to return to the point of departure or any alternate for that point.

Power-off stall speed. The power-off stall speed is the minimum steady flight speed at which the airplane with engines idling is controllable in the landing configuration. (See the airworthiness requirements under which the airplane was type certificated for the manner in which such speed is determined.)

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

Runway. A runway is a hard-surfaced area normally used for the landing or takeoff of airplanes. An unpaved area at the end of a paved area may be considered as part of a runway if it is smooth and firm enough to permit an airplane to traverse it safely.

[*Second in command.* Second in command means a pilot other than the pilot in command who is designated by the air carrier to act as second in command of an airplane.

[(Amendment 42-23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

Second pilot. Second pilot shall include any pilot other than the pilot in command assigned as a member of the flight crew.

Small aircraft. Aircraft of less than 12,500 pounds maximum certificated takeoff weight shall be considered small aircraft.

(Rev. 3/15/61)

Transport category aircraft. **Transport category aircraft are aircraft which have been certificated in accordance with the requirements of Part 4b of this subchapter, or under the transport category performance requirements of Part 4a of this subchapter.**

be desired, he should provide oxygen for this purpose. It is suggested that portable units of any size the air carrier desires be used for this purpose in order that the minimum supply required for supplementary breathing purposes will be preserved. If, however, the operator wishes to use a common source of supply for the oxygen required by the regulations and for clinical purposes, he may do so if he provides an amount of oxygen sufficiently greater than that required by the regulations. It is suggested that a quantity of 300 liters may be considered as satisfying reasonable needs.

(Published in 19 F. R. 549, Feb. 2, 1954, effective Feb. 15, 1954.)

42.27–4 *Oxygen requirements for infants-in-arms (FAA policies which apply to sec. 42.26 (b)).* Provisions should be made for administering oxygen to infants-in-arms and additional oxygen should be carried whenever an unusually large number of infants is carried. This additional oxygen is needed only when there is a passenger or infant for each seat position and the number of infants not provided for exceeds 50 percent of the seat positions. Acceptable methods of administering the oxygen to infants and now used by many operators are: (a) a disposable plastic mask which can be fitted to the face; (b) an infant size BLB oro-nasal mask and (c) semirigid papercups, specifically reserved for the purpose, which can be fitted over the infant's nose and mouth, with a hole punched through the bottom through which an oxygen tube or a Y-connector can be inserted. Any other acceptable method may also be used.

(Published in 19 F. R. 549, Feb. 2, 1954, effective Feb. 15, 1954.)

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

(a) *General.* Prior to November 30, 1959, turbine-powered airplanes with pressurized cabins shall comply with the provisions of section 42.27, with the additional requirement that, when operating at flight altitudes above 25,000 feet, all flight crewmembers on flight deck shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be immediately available for use; or, alternatively, with the provisions of this section except that effective November 30, 1959, all such turbine-powered airplanes shall comply with the provisions of this section. When operating pressurized cabin airplanes, the air carrier shall furnish oxygen and dispensing equipment necessary to permit compliance with the requirements set forth in this section in the event of cabin pressurization failure.

(b) *Crewmembers.* When operating at flight altitudes above 10,000 feet, oxygen shall be provided to permit compliance with section 42.26–T except that not less than a 2-hour supply shall be provided for the flight crewmembers on flight deck duty. The oxygen required by section 42.29 may be included in determining the supply required for flight crewmembers on flight deck duty in the event of cabin pressurization failure.

(c) *Use of oxygen masks by flight crewmembers.*

[(1) When operating above flight level 250, each flight crewmember on flight deck duty shall be provided with an oxygen mask so designed that it is capable of being rapidly placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand; and so designed that upon completion of the donning action the oxygen mask does not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system. When not being used above flight level 250, the oxygen mask shall be kept at all times in a condition for ready use and so located as to be within the immediate reach at all times of the flight crewmember while at his duty station.

[(2) When operating above flight level 250, one pilot at the controls of the airplane shall at all times wear and use an oxygen mask secured, sealed, and supplying oxygen: *Provided,* That the one pilot need not wear and use an oxygen mask while at or below flight level 350 if each flight crewmember on flight deck duty is provided with a quick-donning type of oxygen mask which the air carrier has demonstrated to the satisfaction of a representative of the Administrator is capable of being placed on the face from its ready posi-

tion, properly secured, sealed, and supplying oxygen upon demand, with one hand and within 5 seconds. The air carrier shall also demonstrate that the donning of the mask can be accomplished without disturbing eyeglasses and without delaying the flight crewmember from proceeding with his assigned emergency duties. Upon completion of the donning action, the oxygen mask shall not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system.

[(3) Notwithstanding the provisions in subparagraph (2) of this paragraph, when operating above flight level 250, if at any time it is necessary for one pilot to leave his station at the controls of the airplane for any reason, the remaining pilot at the controls shall don and use his oxygen mask until the other pilot has returned to his duty station.

[(4) Prior to takeoff of a flight, each flight crewmember shall personally preflight his oxygen equipment to insure that the oxygen mask is functioning, fitted properly, connected to appropriate supply terminals, and that the oxygen supply and pressure is adequate for use.]

(Amendment 42–25, published in 24 F.R. 9840, Dec. 8, 1959, effective Nov. 30, 1959; Amendment 42–27, published in 25 F.R. 799, Jan. 30, 1960, effective Feb. 1, 1960; [Amendment 42–31, published in 26 F.R. 1058, Feb. 3, 1961 effective Mar. 3, 1961.)]

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

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

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

(2) When an airplane is operated at flight altitudes to and including 25,000 feet and cannot descend safely to a flight altitude of 14,000 feet within 4 minutes, or when an airplane is operated at flight altitudes above 25,000 feet, oxygen shall be available at the rate prescribed by this part for not less than 10 percent of the number of passenger cabin occupants carried for the duration of flight following cabin depressurization at cabin pressure altitudes above 10,000 feet to and including 14,000 feet and, as applicable, to permit compliance with section 42.26–T (b) (2) and (3), except that not less than a 10-minute supply for all passenger cabin occupants shall be provided.

(3) For first-aid treatment of occupants who for physiological reasons might require undiluted oxygen following descent from cabin pressure altitudes above 25,000 feet, a supply of oxygen in accordance with the requirements of section 4b.651(b)(4) (see section 42.28) shall be provided for 2 percent of the occupants for the duration of flight following cabin depressurization at cabin pressure altitudes above 8,000 feet, but in no case to less than one person. An appropriate number of acceptable dispensing units, but in no case less than 2, shall be provided. Means shall be provided to enable the cabin attendants to use this supply.

(f) *Passenger briefing.* Before flight is conducted above 25,000 feet, a crewmember shall give instructions and demonstrations to the passengers sufficient to insure that all passengers are adequately informed regarding the location and operation of the oxygen-dispensing equipment and the necessity of using oxygen in the event of cabin depressurization.

42.28 *Equipment standards.*

(a) *Reciprocating-engine-powered airplanes.* The oxygen apparatus, the minimum rates of oxygen flow, and the supply of oxygen necessary to comply with the requirements of section 42.26 shall meet the standards established in section 4b.651 of this subchapter effective July 20, 1950: *Provided,* That where

full compliance with such standards is found by the Administrator to be impracticable, he may authorize such changes in these standards as he finds will provide an equivalent level of safety.

(b) *Turbine-powered airplanes.* Prior to November 30, 1959, turbine-powered airplanes shall comply with the provisions of paragraph (a) of this section or, alternatively, with the provisions of this paragraph except that effective November 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 42.26–T and 42.27–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.

42.29 *Protective breathing equipment for the flight crew.*

(a) *Pressurized cabin airplanes.* Each required flight crewmember 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 required flight crewmember on flight deck duty shall be provided for this purpose.

(b) *Nonpressurized cabin airplanes.* The requirements 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

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

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

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

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

(1) *VFR flight.* A valid commercial pilot certificate with the appropriate ratings;

(2) *IFR flight.* A currently effective instrument rating.

42.43 *Pilot qualifications for large aircraft.*

(a) *Pilot in command.* Any pilot serving as pilot in command on large aircraft shall possess a valid airline transport pilot rating with an appropriate rating for the aircraft on which he is to serve.

(b) [*Second in command.*] Before a pilot shall serve as [second in command] on large aircraft, he shall:

(1) Possess a valid commercial pilot rating and instrument rating, or a valid air line transport pilot rating, and

(2) Demonstrate to an authorized representative of the Administrator, or to a check pilot designated by the Administrator, his ability to take off and land each type of aircraft on which he is to serve by making at least three satisfactory takeoffs and landings in each type.

(c) *Three-pilot crew.* In a crew of three or more pilots at least two pilots shall meet the requirements of paragraph (a) of this section. [All other pilots shall meet the requirements of subparagraphs (1) and (2) of paragraph (b) of this section.]

[(Amendment 42–23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

42.44 *Recent flight experience requirements for flight crewmembers.* No air carrier shall utilize an airman, nor shall any individual serve as an airman, unless he meets the appropriate experience requirements specified below:

(a) *Pilots.*

(1) Within the preceding 90 days a pilot shall have made at least 3 takeoffs and landings in an aircraft of the same type on which he is to serve. For night flight one of the takeoffs and landings required above shall have been made at night.

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

[(i) The flight maneuvers specified in section 42.45b(b)(1), except that the simulated engine failure during takeoff need not be accomplished at speed V_1, nor at actual or simulated maximum authorized weight.

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

[(iii) Prior to serving as pilot in command in a particular type of airplane, a pilot

shall have accomplished during the preceding 12 months a proficiency check in that type of airplane.

[(3) *Proficiency checks, second in command on large aircraft.* An air carrier shall not utilize a pilot as second in command until he has satisfactorily demonstrated to a check pilot or a representative of the Administrator his ability to pilot and navigate airplanes to be flown by him and to perform his assigned duties. Thereafter, he shall not serve as second in command unless each 12 months he successfully completes a similar pilot proficiency check. The proficiency check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. Where such pilots serve in more than one airplane type, at least every other successive proficiency check shall be given in flight in the larger airplane type. The proficiency check shall include at least an oral or written equipment examination, and the procedures and flight maneuvers specified in section 42.45b(c)(1). The pilot proficiency check may be demonstrated from either the right or left pilot seat.

[(i) The proficiency check for the second in command of a crew requiring 3 or more pilots shall be the same as required under subparagraph (2) of this paragraph.

[(ii) Subsequent to the initial pilot proficiency check, an approved course of training in an aircraft simulator which meets the requirements of subparagraph (4) of this paragraph if satisfactorily completed may be substituted at alternate 12-month intervals for the proficiency check required by this subparagraph.

[(iii) Satisfactory completion of the proficiency check in accordance with the requirements of subparagraph (2) of this paragraph will also meet the requirements of this subparagraph.

[(Amendment 42–23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

(4) Subsequent to the initial pilot equipment and instrument checks required by subparagraphs (2) and (3), respectively, of this paragraph, an approved course of training in an aircraft simulator, if satisfactorily completed, may be substituted at alternate 6-month intervals for the proficiency check required by subparagraphs (2) and (3). The air carrier shall show that the flight characteristics, performance, instrument reaction, and control loadings of the applicable aircraft are accurately simulated in the aircraft simulator through all ranges of normal and emergency operations in accordance with subdivisions (i) through (vii) of this subparagraph:

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

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

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

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

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

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

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

[(5) ***Proficiency check for pilot in command on small aircraft.*** Within the preceding 6 months the pilot in command on any small aircraft under IFR conditions shall have successfully accomplished an instrument check demonstrating his ability to pilot and navigate by instruments, to accomplish a standard instrument approach using radio range facilities, and to accomplish an instrument approach in accordance with ILS, GCA, or D/F procedures when such facilities are to be used. This instrument check shall be given by an authorized representative of the Administrator or a check pilot of the air carrier, on an aircraft of a type on which the pilot in command is to serve.

[(Amendment 42–30, published in 26 F.R. 93, Jan. 6, 1961, effective Jan. 1, 1961.)]

(b) ***Flight radio operator.*** No individual shall perform, or be assigned to perform, the duties of a flight radio operator unless he has met the recent experience requirements specified in Part 33 of this subchapter.

(c) ***Flight engineer.*** No individual shall be assigned to nor perform duties as a flight engineer unless within the preceding 12 months he has had at least 50 hours of experience as a flight engineer on the type of aircraft on which he is to serve, or until a person designated by the Administrator has checked the airman and determined that he is (1) familiar with all current information and operating procedures relating to the type of aircraft on which he is to serve and (2) competent with respect to the flight engineer's duties on such aircraft.

(d) ***Flight navigator.*** No individual shall be assigned to nor perform duties as a flight navigator unless within the preceding 12 months he has had at least 50 hours of experience as a flight navigator, or until a person designated by the Administrator has checked the airman and determined that he is (1) familiar with all current navigational information pertaining to the operations of the air carrier and (2) competent with respect to the operating procedures and navigational equipment to be used.

42.44–1 *Equipment check (FAA policies which apply to sec. 42.44 (a) (2)).*

(a) *General.* The equipment check for pilots on large aircraft, other than pilots in command, should consist of (1) an equipment examination (oral or written) and (2) a flight check.

The equipment check for pilots in command on large aircraft need only consist of the equipment examination, since a pilot in command should successfully accomplish all of the instrument checks prescribed in section 42.44–2.

(b) *Equipment examination for all pilots.* This examination, which may be oral or written, should be pertinent to the type of aircraft to be flown by the pilot and should be given (1) in the air carrier's ground school, (2) during a routine line check, (3) during the flight phase of the equipment check, or (4) during the instrument checks prescribed in section 42.44–2. The examination should include, but need not be limited to, questions relative to engine power settings, stall speeds at various configurations and weights, airplane placard speeds, critical engine failure speeds, control systems, fuel and lubrication systems, propeller and supercharger operations, hydraulic systems, electric systems, anti-icing, heating and ventilating, and pressurization system (if pressurized).

(c) *Flight check for pilots other than pilots in command.* This check should include at least the following items, but no maneuvers need be accomplished solely by reference to instruments. It may be given during any flight which is of at least one hour duration.

(1) *Preflight planning.* The pilot should be directed to execute a flight plan for the flight involved, including the interpretation of weather maps, upper air charts, and sequence reports.

(2) *Taxiing, sailing, or docking.* Attention should be directed to (i) the manner in which the pilot conducts taxiing, sailing, or docking with reference to the taxi instruction as issued by airport traffic control or other traffic control agency, (ii) any taxi instruction which may be published in the air carrier's operations manual,

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and (iii) general regard for the safety of the air carrier's and other equipment which may be affected by taxiing, sailing, or docking operation.

(3) *Runup.* Attention to detail in the use of cockpit check list and cockpit procedure should be observed on all flight checks.

(4) *Takeoff.* The check pilot should observe the pilot's ability to maintain a constant

42.44–7 *Requirements for approved training course—aircraft simulator (FAA rules which apply to sec. 42.44 (a) (4)).*

(a) *Application for approval.* An applicant desiring approval of an aircraft simulator training course shall submit his application in triplicate to the local Air Carrier Safety Inspector. The application shall contain a training course, including a description of the equipment, facilities, and material to be used, together with a letter to the Administrator of the Federal Aviation Agency requesting approval [13] of the course. The application shall be prepared in looseleaf form, shall include a table of contents, time required for each phase of the course; and procedures for administering the following training course:

(1) *Training course.* Flight equipment used shall be identical to that used in actual flight operations and the course [14] shall incorporate at least the following subjects:

(i) All of the required maneuvers in section 40.282 (b) (1) of this subchapter and section 42.44–2 except the visual flight maneuvers performed around the airport.

(ii) A detailed description of the procedures to be employed in performing each of the required maneuvers applicable to the type aircraft being simulated.

(iii) Emergency procedures concerned with aircraft performance and also all emergency procedures outlined in the approved flight manual.

(b) *Revision of training course.* Requests for revisions of the approved training course, facilities, equipment, and material shall be accomplished in the manner established for securing approval of the original training course. Three copies of the revision shall be submitted in such form that entire pages of the approved course can be removed and replaced by the revision.

(c) *Satisfactory completion of course.* Determination of satisfactory completion of the approved aircraft simulator training course shall be made by an authorized representative of the Administrator or a check airman.

(d) *Cancellation of approval.* Failure to meet or maintain any of the standards established for the approval of a training course shall be considered sufficient reason for cancellation of approval.

(Published in 22 F. R. 8998, Nov. 9, 1957, effective Nov. 25, 1957.)

42.44–8 *Simulation requirements of aircraft simulators used in an approved training course (FAA policies which apply to sec. 42.44 (a)(4)).* The aircraft simulator should fully simulate the following systems or conditions:

All normal cockpit noises (adjustable volume is permissible).
All surface controls.
Gust locks.
Trim tabs.
Landing gear operation.
Wheel brakes.
Steering mechanism used on the ground.
Wing flaps.
Powerplants.
Propellers.
Fuel and oil systems (constant rate of depletion is permissible).
Cockpit and circuit breaker station (circuit breakers relating to nonessential flight equipment need not be operable).
Hydraulic system.
Interior cockpit lights.
Fire detection and extinguishing systems.
Pressurization system for aircraft intended to operate above 25,000 feet.
De-icing and anti-icing systems.
Oxygen system for flight crew.

(Published in 22 F. R. 8999, Nov. 9, 1957, effective Nov. 25, 1957.)

[42.45 *Training requirements for crewmembers serving on large aircraft.*

[(a) Each air carrier shall establish a training program sufficient to insure that each crewmember used by the air carrier is adequately trained to perform the duties to which he is to be assigned. The initial training phases shall be satisfactorily completed prior to serving in passenger or cargo operations.

[(b) Each air carrier shall be responsible for providing adequate ground and flight train-

[13] The Administrator will review the training course, and if it is found adequate, will return an approved copy of the application to the applicant.

[14] Any logical arrangement of the training course material will be acceptable, if all the required maneuvers are included, with appropriate description of techniques and procedures.

ing facilities and properly qualified instructors. There also shall be provided a sufficient number of check airmen to conduct the flight checks required by this part. Such check airmen shall hold the same airman certificates and ratings as are required for the airman being checked.

[(c) The training program for each flight crewmember shall consist of appropriate ground and flight training including proper flight crew coordination. Procedures for each flight crew function shall be standardized to the extent that each flight crewmember will know the function for which he is responsible and the relation of those functions to those of other flight crewmembers. The initial program shall include at least the appropriate requirements specified in sections 42.45a through 42.45e.

[(d) The crewmember emergency procedures training program shall include at least the requirements specified in section 42.45e.

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

[(Amendment 42–23, published in 24 F. R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

42.45–1 *Training program (FAA policies which apply to sec. 42.45).*

(a) *Ground phase.* The ground phase of the air carrier's pilot training and instruction program shall include:

(1) A study of the regulations in this subchapter applicable to irregular air carrier operation and of the provisions of the air carrier's operating certificate, including methods and principles of determining weight limitations for landings and takeoffs;

(2) A study of the company's operations manual and procedures;

(3) Training in the duties and responsibilities of flight crew and crewmembers;

(4) Through familiarization with the aircraft to be flown including the engines and all major components, operation of cabin pressurization (if installed), oxygen system, standard operating procedures, a study of the *FAA* approved Airplane Flight Manual;

(5) A study of navigation, use of radio aids to navigation and such refresher courses necessary to keep airmen current in the application of any new developments;

(6) A study of meteorology sufficient to maintain a practical knowledge of the principles of icing, fog, thunderstorms and frontal systems, etc., and the best method of operating under these various conditions.

Training and instruction in synthetic-type training devices may be included in the ground phase of the training program. However, such training should be so planned that it will supplement the flight training phase and afford further training in specific instrument let-down procedures to be conducted by the pilot in irregular air carrier operations.

(b) *Flight phase.* The flight phase of the training program should be so planned as to insure adequate initial qualification of the pilot on the type aircraft on which he is to serve. It shall also provide for the continued maintenance of a high standard of pilot proficiency. This training shall include, but not be limited to:

(1) Takeoffs and landings under varying conditions of load, wind, low ceiling and visibility, inoperative engine, etc.;

(2) Flight with one or more engines inoperative, including flight with any one engine fully throttled at maximum authorized load, either at one-engine-inoperative service ceiling or at an altitude equivalent to 1,000 feet above the highest part of the terrain on the route or routes to be flown;

(3) Operating under normal and maximum limits of power and speed;

(4) Conduct instrument flight including navigation by low frequency radio ranges, VHF, and ADF, letting-down-through procedures utilizing radio range, ADF, ILS, GCA, etc., whichever is used by the air carrier in its normal operations.

(c) *Emergency procedures.* The training program shall include instruction in emergency procedures particularly with respect to engine failure, fire in the air or on the ground, evacuation of passengers, location and operation of all emergency equipment, power settings for maximum endurance and maximum range, etc.

(d) *Other.* Whenever flight engineers, flight radio operators, flight navigators, or cabin

attendants are utilized, appropriate and adequate training and instruction shall be included in the air carrier's training program.

(Published in 14 F. R. 7039, Nov. 22, 1949, effective upon publication.)

[42.45a *Initial pilot ground training.* Ground training for all pilots shall include instruction in at least the following:

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

[(b) Appropriate contents of the manuals;

[(c) The duties and responsibilities of crewmembers;

[(d) The type of airplane to be flown, including a study of the airplane, engines, all major components and systems, performance limitations, standard and emergency operating procedures, and appropriate contents of the approved Airplane Flight Manual;

[(e) The principles and methods of determining weight and balance limitations for takeoff and landing;

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

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

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

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

[(Amendment 42-23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

[42.45b *Initial pilot flight training.*

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

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

[(1) In each type of airplane to be flown by him:

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

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

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

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

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

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

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

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

[(ii) Taxiing,

[(iii) Takeoffs and landings,

[(iv) Climbs and climbing turns,

[(v) Slow flight,

[(vi) Approach to stall,

[(vii) Engine shutdown and restart,

[(viii) Takeoff and landing with simulated engine failure,

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

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

[(Amendment 42–23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

[42.45c *Initial flight navigation training.*

[(a) The training for flight navigation shall include the applicable portions of at least paragraphs (a) through (d) and (f) through (h) of section 42.45a.

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

[(Amendment 42–23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

[42.45d *Initial flight engineer training.*

[(a) The training for flight engineers shall include at least the instruction specified in section 42.45a (a) through (e).

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

[(Amendment 42–43, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

[42.45e *Initial crewmember emergency training.*

[(a) The training in emergency procedures shall be designed to give each crewmember appropriate individual instruction in all emergency procedures, including assignments in the event of an emergency, and proper coordination between crewmembers. At least the following subjects as appropriate to the individual crewmembers shall be taught: The procedures to be followed in the event of the failure of an engine, or engines, or other airplane components or systems, emergency decompression, fire in the air or on the ground, ditching, evacuation, the location and operation of all emergency equipment, and power setting for maximum endurance and maximum range.

[(b) Synthetic trainers may be used for training of crewmembers in emergency procedures where the trainers sufficiently simulate flight operating emergency conditions for the equipment to be used.

[(c) All crewmembers performing duties on pressurized airplanes operated above flight level 250, shall, as a part of their approved emergency procedure training, receive instructions by means of lectures and films covering at least: respiration, hypoxia, duration of consciousness at altitude when supplemental oxygen is not supplied, gas expansion, gas bubble formation, physical phenomena and incidents of decompression; and receive actual training and practice in the donning of the oxygen mask and operation of the oxygen equipment. In lieu of the required films, the air carrier may use any other equivalent means of visual presentation which, after demonstration, meets with the approval of a representative of the Administrator.

[(Amendment 42–23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961; Amendment 42–31, published in 26 F.R. 1058, Feb. 3, 1961, effective Mar. 3, 1961.)]

[42.45f *Recurrent training.*

[(a) Each air carrier shall provide such training as is necessary to insure the contin-

ued competence of each crewmember and to insure that each possesses adequate knowledge of and familiarity with all new equipment and procedures to be used by him.

[(b) Each air carrier shall, at intervals established as part of the training program, but not to exceed 12 months, check the competence of each crewmember with respect to procedures, techniques, and information essential to the satisfactory performance of his duties. Where the check of the pilot in command or second in command requires actual flight, such check shall be considered to have been met by the checks accomplished in accordance with sections 42.44(a)(2) or 42.44(a)(3), respectively.

[(c) The appropriate instructor, supervisor, or check airman shall certify as to the proficiency demonstrated, and such certification shall become a part of the individual's record.

[(Amendment 42–23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

[42.45g *Approval of training programs.* The training program established by the air carrier under the provisions of sections 42.45 through 42.45f shall meet with the approval of an authorized representative of the administrator: *Provided,* That the curriculum of such training program shall be submitted in appropriate form to an authorized representative of the Administrator not later than May 1, 1960.

[(Amendment 42–23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961, except as noted in proviso.)]

[42.45h *Flight crewmember qualification for large aircraft.*

[(a) No air carrier shall utilize any flight crewmember, nor shall any such airman perform the duties authorized by his airman certificate, unless he satisfactorily meets the appropriate requirements of sections 42.40, 42.41, 42.43, 42.44; and 42.45 or 42.45f.

[(b) Check airman shall certify as to the proficiency of the pilot being examined, as required by sections 42.43(b) and 42.44(a) and such certification shall become a part of the airman's record.

[(Amendment 42–23, published in 24 F.R. 9773, Dec. 5, 1959, effective Jan. 1, 1961.)]

42.46 *Logging flight time.*

(a) A pilot in command may log his total flight time.

(b) A second pilot holding an airline transport pilot certificate and rating for the aircraft flown may log the total time during which he is on duty on the flight deck.

(c) A second pilot not holding an airline transport pilot certificate and rating for the aircraft flown may log 50 percent of the total flight time during which he is on duty on the flight deck.

(d) A pilot may log as instrument flight time only such time as he is actually manipulating the controls when the aircraft is being flown solely by reference to instruments.

42.47 *Grace period for airman periodic checks.* Whenever this part requires an airman check at stated intervals, such check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due.

42.48 *Flight time limitations for pilots on large aircraft.* The following limitations shall be applicable to pilots serving on large aircraft.

(a) *Individual pilot limitations.*

(1) A pilot may be scheduled to fly 8 hours or less during any 24 consecutive hours without a rest period during such 8 hours.

(2) A pilot shall receive 24 hours of rest before being assigned further duty when he has flown in excess of 8 hours during any 24 consecutive hours.

(3) A pilot shall be relieved from all duty for not less than 24 consecutive hours at least once during any 7 consecutive days.

(4) A pilot shall not fly as a crewmember in air carrier service more than 100 hours during any 30 consecutive days.

(5) A pilot shall not fly as a crewmember in air carrier service more than 1,000 hours in any one calendar year.

(6) A pilot shall not do other commercial flying if his total flying time for any specified period will exceed the limits of that period.

(7) Time spent in any deadhead transportation shall in no case be considered as part of a required rest period.

(b) *Aircraft having a crew of two pilots.*

(1) A pilot shall not be scheduled to fly in excess of 8 hours during any 24-hour period unless he is given an intervening rest period at or before the termination of 8 scheduled hours of flight duty. Such rest period shall equal at least twice the number of hours flown since the last preceding rest period, and in no case shall such rest period be less than 8 hours. During such rest period the pilot shall be relieved of all duty with the air carrier.

(2) A pilot shall not be on duty for more than 16 hours during any 24 consecutive hours.

(c) *Aircraft having a crew of three pilots.*

(1) A pilot shall not be scheduled for duty on the flight deck in excess of 8 hours in any 24-hour period.

(2) A pilot shall not be scheduled to be aloft for more than 12 hours in any 24-hour period.

(3) A pilot shall not be on duty for more than 18 hours in any 24-hour period.

(d) *Aircraft having a crew of four pilots.*

(1) A pilot shall not be scheduled for duty on the flight deck in excess of 8 hours during any 24-hour period.

(2) A pilot shall not be scheduled to be aloft for more than 16 hours in any 24-hour period.

(3) A pilot shall not be on duty for more than 20 hours during any 24-hour period.

42.48–1 *"Scheduled to fly," "scheduled to be aloft," and "scheduled for duty on the flight deck" (FAA interpretations which apply to sec. 42.48).* The phrases "scheduled to fly" and "scheduled to be aloft," as used in this section, refer to the estimated "block-to-block time" for a particular flight under normal operating conditions. The phrase "scheduled for duty on the flight deck," as used in this section, refers to that portion of such "block-to-block time" during which the airman is scheduled for flight duty on the aircraft.

(Published in 14 F. R. 7040, Nov. 22, 1949, effective upon publication.)

42.48–2 *Scheduled type operations (FAA policies which apply to sec. 42.48).* An operator conducting a scheduled type operation (e. g., scheduled cargo-only service, regular flights between points pursuant to a military contract, etc.) may establish flight operations schedules for a particular route or route segment in order to determine compliance with the scheduling provisions of the flight time limitations.

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

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

Flight Operation Rules

42.51 *Pilot responsibilities.*

(a) *Pilot in command.* The pilot in command of the aircraft shall be designated by the air carrier.

(b) *Preflight action.* Prior to commencing a flight the pilot in command shall familiarize himself with the latest weather reports pertinent to the flight issued by the United States Weather Bureau or if unavailable, by the most reliable source, and with the information necessary for the safe operation of the aircraft en route, and on the airports or other landing areas to be used, and determine that the flight can be completed with safety.

(c) *Charts and flight equipment.* The pilot in command shall have in his possession in the cockpit proper flight and navigational facility charts, including instrument approach procedures when instrument flight is authorized, and such other flight equipment as may be necessary to properly conduct the particular flight proposed.

(d) *Emergency decisions.*

(1) When required in the interest of safety, a pilot may make any immediate decision and follow any course of action which in his judgment appears necessary, regardless of pre-

scribed methods or requirements. He shall, where practicable, keep the proper control station fully informed regarding the progress of the flight.[6]

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

(e) *Serviceability of equipment.* Prior to starting any flight, the pilot shall determine that the aircraft, all engines and propellers, appliances and required equipment, including all instruments, are in proper operating condition. If during the flight any such engine, propeller, appliance, or equipment malfunctions or becomes inoperative, the pilot in command shall determine whether the flight can be continued with safety. Unless he believes that flight can be continued safely, he shall hold or cancel it until satisfactory repairs or replacements are made.

[6] See section 42.94 for the report to be filed by the pilot where the authority granted by this section is exercised.

(f) *Admission to flight deck of aircraft having a separate pilot compartment.* No persons, other than crewmembers, shall be admitted to the flight deck of an airplane having a separate pilot compartment except those authorized in subparagraphs (1) and (2) of this paragraph. For the purposes of this section, the Administrator shall determine what constitutes the flight deck.

(1) FAA Flight Operations and Airworthiness Inspectors and authorized representatives of the Board while in the performance of official duties shall be admitted to the flight deck.

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

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

(i) An employee of the Federal Government or of an air carrier or other aeronautical enterprise whose duties are such that his presence on the flight deck is necessary

SPECIAL CIVIL AIR REGULATION NO. SR-399C

Effective: October 26, 1960
Adopted: October 25, 1960

Provisional Maximum Certificated Weights for Certain Airplanes Operated by Alaskan Air Carriers, Alaskan Air Taxi Operators, and the Department of the Interior

Special Civil Air Regulation No. SR-399B (24 F.R. 4304) which superseded SR-399A (20 F.R. 8091) authorized the Director, Bureau of Flight Standards, and his designated representatives to establish increased maximum weights for certain airplanes of 12,500 pounds or less operated entirely within Alaska by Alaskan air carriers and Alaskan air taxi operators pursuant to Parts 292 and 293 of the Civil Aeronautics Board's Economic Regulations or by the United States Department of the Interior.

SR-399B amended SR-399A to permit Alaskan air taxi operators, formerly designated as Alaskan pilot-owners, to continue operating under the increased maximum weight provisions. The authority contained in SR-399B terminates on October 25, 1960. Since the domestic economy of Alaska is greatly dependent upon the continuing use by Alaskan operators of airplanes of 12,500 pounds or less, and since the Department of the Interior expects to continue to use such airplanes in Alaska, the authority currently provided by this special regulation is being extended for a period of five years. Alaskan air taxi operators will remain subject to the 7,900-pound weight limitation imposed by Part 293.

Since this regulatory action extends the provisions of a previous regulation and 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.

In consideration of the foregoing, the following Special Civil Air Regulation is hereby adopted, to become effective October 26, 1960:

1. Notwithstanding any contrary provisions of the Civil Air Regulations, the Director, Bureau of Flight Standards, and any employee of such administrative unit as he shall designate may increase the maximum certificated weight for airplanes which are:

(a) Operated entirely within the State of Alaska by an Alaskan air carrier or an Alaskan air taxi operator pursuant to Parts 292 and 293, respectively, of the Civil Aeronautics Board's Economic Regulations, or by the United States Department of the Interior in the conduct of its game and fish law enforcement activities and its management, fire detection, and fire suppression activities concerning public lands; and

(b) Type certificated under the provisions of Aeronautics Bulletin No. 7-A of the Aeronautics Branch of the United States Department of Commerce dated January 1, 1931, as amended, or under the normal category of Part 4a of the Civil Air Regulations.

2. The maximum certificated weight herein referred to shall not exceed any of the following:

(a) 12,500 pounds,

(b) 115 percent of the maximum weight listed in the FAA Aircraft Specification,

(c) The weight at which the airplane meets the positive maneuvering load factor requirement for the normal category specified in Section 3.186 of the Civil Air Regulations, or

(d) The weight at which the airplane meets the climb performance requirements under which it was type certificated.

3. In determining the maximum certificated weight the structural soundness of the airplane and the terrain to be traversed in the operation will be considered.

4. The maximum certificated weight so determined will be added to the airplane's operation limitations and identified as the maximum weight authorized for operations within the State of Alaska.

This regulation supersedes Special Civil Air Regulation No. SR–399B, and shall terminate on October 25, 1965, unless sooner superseded or rescinded.

determined at all altitudes, and at ambient temperatures if applicable, at which performance credit is to be applied and shall not exceed that established in compliance with the provisions of paragraph (b) of this section.

(b) The flight path, with the engines operating at the power and/or thrust appropriate to the airplane configuration and with standby power in use, shall lie above the flight path without standby power in use at the maximum weight at which all of the applicable airworthiness requirements are met. In addition, the flight paths shall comply with the provisions of subparagraphs (i) and (ii) of this paragraph.

(i) The flight paths shall be established without changing the appropriate airplane configuration.

(ii) The flight paths shall be carried out for a minimum height of 400 feet above the point where standby power is actuated.

(6) *Airplane configuration, speed, and power and/or thrust; general.* Any change in the airplane's configuration, speed, and power and/or thrust shall be made in accordance with the procedures established by the applicant for the operation of the airplane in service and shall comply with the provisions of paragraphs (a) through (c) of this section. In addition, procedures shall be established for the execution of balked landings and missed approaches.

(a) The Administrator shall find that the procedure can be consistently executed in service by crews of average skill.

(b) The procedure shall not involve methods or the use of devices which have not been proven to be safe and reliable.

(c) Allowances shall be made for such time delays in the execution of the procedures as may be reasonably expected to occur during service.

(7) *Installation and operation; standby power.* The standby power unit and its installation shall comply with the provisions of paragraphs (a) and (b) of this section.

(a) The standby power unit and its installation shall not adversely affect the safety of the airplane.

(b) The operation of the standby power unit and its control shall have proven to be safe and reliable.

[Page 227 follows. (Pages 225 and 226 were removed by Supplement No. 2 dated March 15, 1961.)]

Amendment 42-20

Frequency of Pilot Proficiency Checks

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

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

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

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

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

Amendment 42-21

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

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

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

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

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

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

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

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

Amendment revised section 42.22(c).

Amendment 42-22

Pilot Training and Check Program

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

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

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

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

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

Amendment revised section 42.40(a).

Amendment 42-23

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

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

The Federal Aviation Agency published as a notice of rule making (24 F.R. 5246) and circulated as Civil Air Regulations Draft Release No. 59-3, dated June 25, 1959, a proposal to amend Part 42 of the Civil Air Regulations to require: (1) FAA approval of air carrier training programs, (2) appropriate aircraft ratings for pilots serving as other than pilots in command, and (3) more specific initial training and recurrent proficiency checks for pilots serving as other than pilots in command.

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

The term "second in command," is used in lieu of second pilot in this regulation in order that the air carrier rules of Parts 40, 41, and 42 will contain uniform terminology with respect to the copilot function. In this regard, it will be noted that an approrpiate definition of "second in command" is added to this regulation and that the term second in command has been substituted for the term second pilot in section 42.43(b).

With regard to an operation requiring a crew combination of three or more pilots Part 42 presently provides that the pilot in command and second in command shall hold valid airline transport pilot certificates and ratings for the aircraft when serving in such a crew combination. Since the pilot designated as second in command in a crew requiring three or more pilots is required by the present regulations to have the same basic qualifications as the pilot in command, it is deemed reasonable to require such second in command to be initially trained on the aircraft to a degree of proficiency commensurate to that of the pilot in command. Accordingly, the provisions of this amendment require a pilot serving as second in command in an operation requiring three or more pilots to comply with the same initial training requirements as apply to the pilot in command.

With respect to pilots other than the pilot in command and second in command in a crew complement requiring three or more pilots, the original proposal has been modified so as not to require such pilots to obtain an aircraft type rating. In lieu of a type rating, this regulation requires in the interest of safety that such pilots accomplish the initial training prescribed in section 42.45b(a). In this connection it should be understood that such pilots will not be required to comply with the training requirements specifically applicable to a pilot in command, or a second in command serving in a crew requiring 3 or more pilots.

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

Although the air carriers were opposed to this requirement, the Agency remains firm in its belief that in order to make certain that all pilots serving as second in command are initially proficient and continue to maintain such proficiency, they must be given a proficiency check by a designated check pilot or a representative of the Administrator. However, upon reconsideration of the original proposal in the light of comment received, the Administrator has concluded that an adequate level of safety will be maintained if such proficiency checks are given only once each 12 months to pilots serving as second in command. Accordingly, such requirements are reflected in this amendment.

In Draft Release 59–3, it was proposed to include in the proficiency check at least the takeoffs and landings and other flight maneuvers generally covered in section 42.45b(a). However, the original proposal is being modified by this amendment to provide that the proficiency check for the second in command of a two-pilot crew shall include an oral or written equipment examination, and at least the procedures and flight maneuvers specified in new section 42.45b(c)(1).

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

Comment received indicated that interested persons opposing Draft Release 59–3 believed the proposal would require copilots to acquire and demonstrate the same level of proficiency as is presently required of pilots in command. The Administrator wishes to make it clear that identical proficiency standards will not be required for such pilots. Under the provisions of Part 42 a pilot assigned to duty on an aircraft as second in command in a two-pilot crew is presently required to hold a commercial pilot certificate and instrument rating, whereas a pilot in command is required to hold the higher rating of an airline transport certificate with appropriate aircraft type ratings. Accordingly, in view of this difference in the certification requirements, pilots serving as second in command in two-pilot crews will not be held to the high degree of skill required of a pilot in command. However, they will be required to demonstrate that they possess the knowledge and skill to perform their duties as a copilot safely and efficiently, and to navigate and pilot the airplane to which they are assigned safely to a destination in the event the pilot in command becomes incapacitated during flight.

Because of the importance of this amendment, each portion thereof has been evaluated in the light of such comments.

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

It must be emphasized that the training program is one of the most important factors in the safety of air carrier operations. The quality and scope of such programs are the key to insuring that all crewmembers are competent to perform their duties with the high degree of skill expected and required in air carrier operations. Under the provisions of the present regulation, the air carriers are given discretion in establishing "adequate" or "appropriate" training, or "training as necessary." As a result some air carriers have prepared and are administering excellent training programs. However, others have not achieved the minimum safety objective sought by the training requirements of section 42.45. While the methods and procedures employed by the various air carriers in their training programs may differ to fit the particular operation of each air carrier, each training program must provide a uniform and minimum standard of flight and ground training necessary for safety in air transportation. Experience in the administration of the present regulations shows that this standard can only be achieved by FAA approval of each training program.

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

Part 42 presently requires each air carrier to establish a training program sufficient to insure that each crewmember used by the air carrier is adequately trained and maintains adequate proficiency to perform the duties to which he is to be assigned. However, Part 42 does not contain sufficient guidance to the air carrier with respect to ground and flight training requirements which should be included in the training program in order to obtain FAA approval. Accordingly, pertinent training program requirements similar to those in Part 40 are being prescribed in Part 42 by this amendment.

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

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

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

Part 42 currently provides for two different types of pilot crew complements: Namely, (a) a two-pilot crew and (b) a three or more pilot crew. With respect to the two-pilot crew, upon reevaluation of the original proposal in light of comments received, it appears that the objective of the original proposal can be achieved without requiring the second in command in a two-pilot crew to obtain an appropriate aircraft type rating, provided adequate flight training for such a pilot is provided in the initial and recurrent training requirements of this part and is part of the training program approved by the Administrator.

Accordingly, the original proposal has been modified in this regulation by omitting the aircraft type rating requirement for the second in command in a two-pilot crew. In lieu of a type rating this regulation prescribes in section 42.45b(c) certain minimum maneuvers and procedures in which it is considered necessary that pilots serving as second in command in a two-pilot crew be proficient, and requires that they receive instructions and practice in such maneuvers and procedures during initial flight training.

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

This regulation is being made effective January 1, 1961. This effective date will allow air carriers subject to Part 42 sufficient time in which to obtain FAA approval of their training programs and to accomplish the initial demonstration check of pilots other than pilot in command required by this amendment. However, each air carrier will be required to submit its training program to the FAA for approval not later than May 1, 1960.

Although compliance with the requirements prescribed in this amendment may result in some additional costs to the air carriers, it appears that such costs are outweighed by the considerations of safety involved.

Amendment added definition "second in command" to section 42.1; changed "second pilot" to "second in command" in the title and first sentence of section 42.43(b); added a new sentence at the end of section 42.43(c); amended subparagraphs (2) and (3) of section 42.44(a); amended section 42.45; and added new sections 42.45a through 42.45h.

Amendment 42–29

Installation of Flight Recorders on Turbine-Powered Airplanes

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Amendment 42–30

Recent Flight Experience Requirements for Flight Crewmembers	Effective:	Dec. 30, 1960
	Adopted:	Jan. 1, 1961
	Published:	Jan. 6, 1961 (26 F.R. 93)

Currently effective section 42.44(a)(3) of the Civil Air Regulations requires that the pilot in command on any aircraft under IFR conditions shall have successfully accomplished an instrument check within the preceding 6 months. This and certain other provisions of Part 42 are presently applicable to air taxi operations and to commercial operations with small aircraft, and such operations will continue to be governed by the provisions of Part 42 until such time as Part 47 of the Civil Air Regulations, "Certification and Operation Rules Governing the Carriage of Persons or Property for Compensation or Hire with Small Aircraft," becomes effective.

Civil Air Regulations Amendment 42–23, issued December 1, 1959, and to become fully effective January 1, 1961, includes a revision of the recent flight experience for pilots contained in section 42.44(a)(3). At the time this amendment was issued, it was anticipated that Part 47 would become effective before January 1, 1961; consequently, the revised section 42.44(a) makes no provision for instrument checks of the pilot in command on small aircraft.

Since Part 47 will not become effective by January 1, 1961, a serious safety deficiency will be created when Amendment 42–23 becomes fully effective on that date, as there will then be no regulatory basis for requiring periodic instrument proficiency checks for pilots in command engaging in IFR air taxi and small aircraft commercial operations. In view of this safety deficiency, which will otherwise occur on January 1, 1961, it is necessary to extend the present requirements of section 42.44(a)(3), as they apply to pilots in command on small aircraft used in IFR operations, until such time as Part 47 becomes effective.

This amendment reinstates a present requirement which will be eliminated by Amendment 42–23 on January 1, 1961. The periodic instrument proficiency checks of pilots in command of small aircraft used in air taxi and commercial operations have long been a required safety standard, and it is imperative that this standard be maintained without interruption. Therefore, notice and public procedure hereon are impracticable, and the amendment may be made effective on less than 30 days' notice.

Amendment added new subparagraph (5) to section 42.44(a).

Amendment 42-31

Oxygen Mask Requirements and Altitude Training for Flight Crewmembers Assigned to Duty on Turbine-Powered Airplanes Operated Above 25,000 Feet

Effective: March 3, 1961
Adopted: Jan. 19, 1961
Published: Feb. 3, 1961
(26 F.R. 1058)

The currently effective provisions of section 42.27-T(c) of Part 42 of the Civil Air Regulations require one pilot at the controls of a turbine-powered airplane to wear and use an oxygen mask when operating above 25,000 feet, and the remaining flight crewmembers to wear their masks in a position permitting immediate placing of the masks on their faces for use, properly secured and sealed. A proviso to the currently effective rule relieves the one pilot at the controls of the necessity of using a mask at or below 30,000 feet if all flight crewmembers are equipped with a "quick-donning" type of oxygen mask which is demonstrated to be satisfactory to a representative of the Administrator.

Civil Air Regulation Draft Release No. 60-15, dated August 24, 1960 (25 F.R. 8381), proposed certain amendments to the requirements for the use of oxygen masks by flight crewmembers and certain altitude training requirements for flight crewmembers assigned to duty on turbine-powered airplanes operated above 25,000 feet.

In Draft Release 60-15, it was proposed to retain that part of the currently effective rule requiring one pilot to wear and use an oxygen mask when operating above 25,000 feet and all other flight crewmembers to wear their masks in a position for ready use. However, it was proposed to amend the proviso to the current rule and increase the altitude above which one pilot must wear and use an oxygen mask from 30,000 feet to 35,000 feet, provided all flight crewmembers are equipped with a quick-donning type of oxygen mask and are wearing the same in a ready position for use. It was proposed to classify an oxygen mask as a quick-donning type only if the mask is demonstrated to be one capable of being immediately placed on the face from the position being worn, and is shown to meet the following criteria: (1) that the mask can be placed on the face for use, properly secured and sealed, with either hand; (2) that the action of donning the mask can be accomplished without disturbing glasses, headphones, or other equipment worn; and (3) that the action of donning the mask can be accomplished without distracting or delaying the flight crewmember from proceeding with his assigned emergency procedures.

Industry comments unanimously supported the proposal to raise the present limitation of 30,000 feet to 35,000 feet as the altitude above which one pilot at the controls must wear and use an oxygen mask at all times. It was recommended, however, that the altitudes be specified in terms of "flight levels," to accord with the terminology used in the air traffic rules of Part 60 for high altitude flights. This recommendation has been incorporated into the final rule.

The industry groups expressed opposition to the proposal to continue the requirement that above an altitude of 25,000 feet flight crewmembers on flight deck duty must wear an oxygen mask at all times. Comment was also critical of the other criteria proposed with respect to the donning of oxygen masks, particularly that set forth in the proviso of the proposed rule for the quick-donning type of mask.

In lieu of the donning criteria proposed, certain industry comment recommended, for several reasons, that the rule require only that oxygen masks be located in a ready position for placement on the face in a fully operative condition within a specific time limit, such as 5 seconds. Such a period of time is well within the period beyond which the lack of oxygen becomes a critical safety factor.

In light of the comments received, we have reevaluated the requirement that oxygen masks must be worn, as well as the criteria proposed for classifying a mask as a quick-donning type. At the time the wearing of oxygen masks was originally prescribed, the use of turbine-powered airplanes in civil air transportation had just begun. Thus, the lack of previous operating experience with such airplanes and the type of oxygen masks than available justified a most conservative approach to the requirements for oxygen masks. Since that time we have accumulated many thousands of hours of experience in the operation of turbine-powered airplanes having pressurized cabins and the occurrence of sudden decompressions has been infrequent. Furthermore, certain oxygen masks and their harnesses have so advanced in design that they can meet the standards prescribed for the

quick-donning concept. Upon consideration of these factors, we believe it is no longer necessary to require the oxygen mask to be worn on the person of flight crewmembers. However, above flight level 250 we consider it necessary to require that the oxygen masks, when not being used, be kept at all times in a condition for ready use, and so located as to be within the immediate reach at all times of the flight crewmembers while at their duty stations.

This final rule requires that, when operating above flight level 250, each flight crewmember be provided with an oxygen mask so designed that it is capable of being rapidly placed on the face from its ready position, properly secured, sealed, and supplying oxygen, upon demand. The mask must also be so designed that upon completion of the donning action it does not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system. If flight crewmembers are provided with oxygen masks which meet these standards, the regulation requires one pilot at the controls of the airplane to wear and use an oxygen mask at all times while operating above flight level 250. However, as stated in the proviso to the rule, if each flight crewmember on flight deck duty is provided with a quick-donning type of oxygen mask, the one pilot at the controls of the airplane need not wear and use an oxygen mask while at or below flight level 350.

Upon consideration of comments received, the criteria proposed for the quick-donning type of oxygen mask have been changed to specify a donning time of 5 seconds. The proposal to require a demonstration that the mask is capable of being donned without disturbing headphones has been deleted. However, the Agency considers it necessary to require, as criteria for the quick-donning type of oxygen mask, a demonstration: (1) that the mask is capable of being placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand, with one hand and within 5 seconds; (2) that the donning of the mask can be accomplished without disturbing eye glasses and without delaying the flight crewmember from proceeding with his assigned emergency duties; and (3) that upon completion of the donning action, the oxygen mask does not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system.

The Agency has concluded that if all flight crewmembers are provided with an oxygen mask which qualifies as a quick-donning type of mask, they will be sufficiently equipped for protection against the dangers of hypoxia to justify not requiring one pilot at the controls to wear and use an oxygen mask while operating at or below flight level 350. Above that flight level, however, the time element becomes more critical and in the interest of safety we consider it necessary to require one pilot at the controls to wear and use an oxygen mask at all times.

The Agency believes that the initial and recurrent instructional training given flight crewmembers should include actual training and practice in donning the oxygen mask. If masks of the quick-donning type are provided by the air carrier, it should require each flight crewmember to demonstrate his ability to properly don the mask from its ready position, with one hand and within 5 seconds, and proceed with his emergency duties without delay. Such training and practice are equally as important to personal safety as the quick-donning characteristics of the mask which have been demonstrated by the air carrier.

Presently, the maximum certificated ceiling for transport category airplanes used in air carrier operations is 42,000 feet. If higher ceilings are authorized in the future for airplanes used in air carrier operations, the Agency will undertake to evaluate the present rules in light of such operations and, if necessary, prescribe additional oxygen equipment and operational procedures to insure the protection of all occupants of the airplane.

With regard to the proposal for pressure chamber indoctrination for each flight crewmember, after fully considering all comments received and all factors involved, we have concluded that such a requirement should not be adopted. We believe that the trainee experiencing hypoxia does not benefit from the experience as much as the persons who are objectively observing the occurrence; nor is he apt to recall what took place while under the effects of hypoxia. Flight crewmembers participating in the air carriers' approved training programs, which include films, lectures, and studies of all phases of the subject of high-altitude operations, will be equally well indoctrinated with the dangers attendant upon hypoxia and the need for compliance with the techniques and emergency procedures involved in the event of a rapid decompression.

Therefore, in lieu of experiencing the actual low pressure chamber indoctrination, we are requiring all flight crewmembers, as a part of their approved emergency training, to receive initial and recurrent instruction by means of lectures and films covering at least respiration, hypoxia, duration of consciousness at altitude when supplemental oxygen is not supplied, gas expansion, gas bubble formation, physical phenomena and incidents of decompression, and actual training and practice in the donning of the oxygen mask and operation of the oxygen equipment.

In lieu of the required films, the air carrier may use any other equivalent means of visual presentation which meets with the approval of a representative of the Administrator. One such means would be participation by flight crewmembers in actually observing other people undergoing high-altitude training in a low pressure chamber.

The rule also provides that each flight crewmember, prior to each flight, shall personally preflight his oxygen equipment to insure that the oxygen mask is functioning, fitted properly, and connected to appropriate supply terminals, and that the oxygen supply and pressure is adequate for use. Additionally, the rule requires that whenever it is necessary for one pilot to leave his station at the controls when operating above flight level 250, the remaining pilot shall don and use his oxygen mask until the other pilot has returned to his duty station.

Oxygen masks classified as quick-donning masks under the regulation in force prior to the effective date of this amendment will be considered as satisfactorily meeting the requirements prescribed by this amendment for quick-donning masks without further demonstration.

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. The Air Line Pilots Association (ALPA) requested that an industry-wide meeting be scheduled to review the subject of oxygen masks if the amendment adopted herein substantially differs from the intent of the proposals recommended by ALPA. Prior to publication of Draft Release 60–15, a conference was held by the Agency at which the ALPA and other representatives of the industry were afforded an opportunity to express their views and recommendations for the development of rules governing oxygen masks and their use. These views and recommendations were throughly considered in the preparation of proposals contained in Draft Release 60–15. In adddition, interested persons also have been given an apportunity to submit written comments in response to Draft Release 60–15. All of the views and recommendations submitted in the conference and in response to the draft release have been carefully considered and evaluated in the preparation of this final rule. Moreover, as a result of this evaluation, many of these recommendations have been incorporated in the final rule. Accordingly, I find that additional rule making proceedings, as requested by the ALPA, are unnecessary for informed administrative action; and that this amendment should be adopted without further delay.

Amendment revised paragraph (c) of section 42.27–T and added a new paragraph (c) to section 42.45e.
