UNITED STATES OF AMERICA
CIVIL AERONAUTICS BOARD
WASHINGTON, D. C.

Civil Air Regulations Amendment 42-15
Effective: September 1, 1958
Adopted: August 27, 1958

IRREGULAR AIR CARRIER AND OFF-ROUTE RULES

SUPPLEMENTAL OXYGEN REQUIREMENTS FOR SUSTENANCE AND FIRST AID

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

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

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

A provision relating to crew oxygen masks is being added. The time required for the crew to institute the use of their oxygen masks when operating at these altitudes is so short that any location of crew masks that could involve any avoidable loss of time in donning them would not be in the interest of safety. To minimize the danger inherent in this situation, one pilot will be required to wear and to use his mask at all times when operations above 25,000 feet are conducted. The other members of the flight crew will be required to have the masks on their person at all times and in such a position as to be immediately placed on their faces for use. Since the object is to avoid any possible hazard to the passengers following decompression, it is considered necessary that the pilot wearing the mask be drawing oxygen from the system under normal conditions. Since all flight crew members would probably have specified duties following cabin depressurization, it is considered appropriate that masks should be immediately available for each flight crew member on flight deck duty.

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

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

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

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

In consideration of the foregoing, the Civil Aeronautics Board hereby amends Part 42 of the Civil Air Regulations (14 CFR Part 42, as amended) effective September 1, 1958.

1. By amending the title of § 42.26 to read as follows:

42.26 Supplemental oxygen; reciprocating-engine-powered airplanes. * * *

2. By adding a new § 42.26-T to read as follows:

42.26-T Supplemental oxygen for sustenance; turbine-powered airplanes.

(a) General. Prior to July 31, 1959, turbine-powered airplanes shall comply with the provisions of § 42.26 or, alternatively, with the provisions of this section except that effective July 31, 1959, all turbine-powered airplanes shall comply with the provisions of this section. Sustaining oxygen and dispensing equipment shall be furnished by the air carrier for use as set forth in this section. The amount of oxygen provided shall be at least that quantity which will be necessary to comply with paragraphs (b) and (c) of this section. As used in the oxygen requirements hereinafter set forth, "cabin pressure altitude" shall mean the pressure altitude corresponding with the pressure in the cabin of the airplane, and "flight altitude" shall mean the altitude above sea level at which the airplane is operated; for airplanes not equipped with pressurized cabins, "cabin pressure altitude" and "flight altitude" shall be considered identical. The amount of sustaining and first-aid oxygen required for a particular operation to comply with the rules in this part shall be determined on the basis of cabin pressure altitudes and flight duration consistent with the operating procedures established for each such operation and route. The requirements for airplanes with pressurized cabins shall be determined on the basis of cabin pressure altitude and the assumption that a cabin pressurization failure will occur at that altitude or point of flight which is most critical from the standpoint of oxygen need, and that after such failure the airplane will descend in accordance with the emergency procedures specified in the Airplane Flight Manual without exceeding its operating limitations to a flight altitude that will permit successful termination of the flight. Following such a failure the cabin pressure altitude shall be considered to be the same as the flight altitude unless it can be shown that no probable failure of the cabin or pressurization equipment will result in a cabin pressure altitude equal to the flight altitude, under which circumstances the maximum cabin pressure altitude attained may be used as a basis for certification and/or determination of oxygen supply.

(b) Crew members. A supply of oxygen for crew members shall be provided in accordance with the following requirements.

(1) At cabin pressure altitudes above 10,000 feet to and including 12,000 feet, oxygen shall be provided for and used by each member of the flight crew on flight deck duty and provided for all other crew members during the portion of the flight in excess of 30 minutes within this range of altitudes.

(2) At cabin pressure altitudes above 12,000 feet, oxygen shall be provided for and used by each member of the flight crew on flight deck duty and provided for all other crew members during the entire flight at such altitudes.

(c) Passengers. A supply of oxygen for passengers shall be provided in accordance with the following requirements:

(1) For flights at cabin pressure altitudes above 10,000 feet to and including 14,000 feet, oxygen shall be provided for the duration of flight in excess of 30 minutes for 10 percent of the number of passengers carried.

(2) For flights at cabin pressure altitudes above 14,000 feet to and including 15,000 feet, oxygen shall be provided for the duration of flight at such altitude for 30 percent of the number of passengers carried.

(3) For flights at cabin pressure altitudes above 15,000 feet, oxygen shall be provided for each occupant carried for the duration of flight at such altitude.

3. By amending the title of § 42.27 to read as follows:

42.27 Supplemental oxygen requirements for pressurized cabin airplanes; reciprocating-engine-powered airplanes. * * *

4. By adding a new § 42.27-T to read as follows:

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

(a) General. Prior to July 31, 1959, turbine-powered airplanes with pressurized cabins shall comply with the provisions of § 42.27 or, alternatively, with the provisions of this section except that effective July 31, 1959, all such turbine-powered airplanes shall comply with the provisions of this section. When operating pressurized cabin airplanes, the air carrier shall furnish oxygen and dispensing equipment necessary to permit compliance with the requirements set forth in this section in the event of cabin pressurization failure.

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

(c) Use of oxygen masks by flight crew members. When operating at flight altitudes above 25,000 feet, one pilot at the controls of the airplane shall wear and use an oxygen mask at all times and all other flight crew members on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be worn in a manner that will permit immediate placing of the masks on their faces for use, properly secured and sealed.

(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 § 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 § 4b.651 (b) (4) (see § 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 crew member shall give instructions and demonstrations to the passengers sufficient to insure that all passengers are adequately informed regarding the location and operation of the oxygen-dispensing equipment and the necessity of using oxygen in the event of cabin depressurization.

5. By amending § 42.28 to read as follows:

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 § 42.26 shall meet the standards established in § 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 July 31, 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 July 31, 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 §§ 42.26-T and 42.27-T shall meet the standards established in § 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.

(Sec. 205, 52 Stat. 984; 49 U.S.C. 425. Interpret or apply Secs. 601, 603, 604, 605; 52 Stat. 1007, 1009, 1010 as amended; 49 U.S.C. 551, 553, 554, 555)

By the Civil Aeronautics Board:

/s/ Mabel McCart

Mabel McCart
Acting Secretary

(SEAL)

Part 42 last printed December 15, 1954.

USCOMM-DC-25197