UNITED STATES OF AMERICA
FEDERAL AVIATION AGENCY
WASHINGTON, D. C.

Civil Air Regulations Amendment 41-36
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PART 41—CERTIFICATION AND OPERATION RULES FOR SCHEDULED AIR CARRIER OPERATIONS OUTSIDE THE CONTINENTAL LIMITS OF THE UNITED STATES

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

The currently effective provisions of § 41.24a–T(c) of Part 41 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 requirments for the use 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; (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 re-evaluated 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 then 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 decompression 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 de-

signed 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 the donning of 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 thoroughly considered in the preparation of proposals contained in Draft Release 60-15. In addition, interested persons also have been given an opportunity 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.

In consideration of the foregoing, Part 41 of the Civil Air Regulations (14 CFR Part 41, as amended) is amended as follows, effective March 3, 1961.

1. By amending § 41.24a-T(c) to read as follows:

§ 41.24a-T Supplmental oxygen for emergency descent and for first aid; turbine-powered airplanes with pressurized cabins.

* * * * *

(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 position, 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 eye glasses 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.

2. By amending § 41.53e by adding a new paragraph (c) to read as follows:

§ 41.53e **Initial crewmember emergency training.**

* * * * *

(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.

(Secs. 313(a), 601, 604, 72 Stat. 752, 775, 778, 49 U.S.C. 1354(a), 1421, 1424)

Issued in Washington, D.C., on January 19, 1961.

E. R. QUESADA,
Administrator.

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