

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 25 and 121

(Docket No. 22438; Amdt. Nos. 25-56 and 121-181)

Transport Category Airplanes; Cabin Ozone Concentration

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: These amendments relieve operators of certain airplanes from having to purchase, install, and maintain ozone control equipment or establish ozone avoidance procedures. These amendments reduce the operating cost of the affected airplanes with no reduction in flight safety.

EFFECTIVE DATE: January 31, 1983.

FOR FURTHER INFORMATION CONTACT: Mr. Larry Bedore, Project Development Branch (AFO-240), Air Transportation Division, Office of Flight Operations, Associate Administrator for Aviation Standards, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591; telephone (202) 426-8096.

SUPPLEMENTARY INFORMATION:**Background**

The Federal Aviation Administration (FAA) established specific airplane cabin ozone concentration standards for the issuance of type certificates for transport category airplanes. Cabin ozone standards were also adopted for the operation of large transport category airplanes by air carriers and commercial operators. The final rule was published in the Federal Register on January 21, 1980 (45 FR 3880), as Amendments 25-50 and 121-154.

Amendment 25-50 added a new § 25.832 which stated that the airplane cabin ozone concentration during flight above flight level (FL) 180 must be shown not to exceed 0.25 parts per million by volume, sea level equivalent, at any time and 0.1 parts per million by volume, sea level equivalent, time-weighted average during any 3-hour interval.

Amendment 121-154 added a new § 121.220 which was later changed to § 121.578 stating that after February 20, 1981, no certificate holder may operate a transport category airplane above FL 180 unless it has successfully demonstrated to the Administrator that the concentration of ozone inside the cabin will not exceed 0.25 parts per million by volume, sea level equivalent, at any time and for each flight segment

that exceeds 4 hours, 0.1 parts per million by volume, sea level equivalent, time-weighted average over that flight segment.

In response to a petition for rulemaking from the Air Transport Association of America (ATA) dated April 30, 1980, which was published in the Federal Register on September 11, 1980 (45 FR 59905), and a petition from Rosenbalm Aviation, Inc., dated March 31, 1980, which was published in the Federal Register on October 9, 1980 (45 FR 67100), the FAA issued a Notice of Proposed Rulemaking (NPRM) No. 81-15 which was published in the Federal Register on November 23, 1981 (46 FR 57442). That notice proposed amendments to §§ 25.832 and 121.578 of the regulations to relieve operators of cargo-only airplanes and narrow-body four-engine airplanes to be retired or re-engined because of the FAA's noise regulations (14 CFR Part 91, Subpart E) from the necessity of meeting the ozone operating requirements and to simplify the compliance requirements for many other airplane operations.

Discussion of Comments

Sixteen public comments were received in response to NPRM 81-15. In summary, nine commenters agree with the NPRM; two disagree; and five comment on the overall cabin ozone concentration methodology.

The nine concurrences were from the ATA, Aerospace Industries Association of America, Inc. (AIA), Englehard Industries Division (a manufacturer of catalytic ozone destruction filters), the Human Factors Division, Wright-Patterson Air Force Base Ohio, and five air carriers. Of the air carriers, two operate four-engine narrow-body aircraft; two operate turboprop aircraft; and one is a cargo operator.

ATA also comments that a few B-727 aircraft flights exceed 4 hours, and penalties will be associated with complying with the time-weighted average (TWA) provisions of the rule. Because of these penalties and Report No. FAA-AM-80-16, Subject: "Effects of Long-Term Exposure to Low Levels of Ozone: A Review," by C. E. Melton of the FAA Civil Aeromedical Institute, dated September 1980, (which according to ATA finds the entire TWA concept to be one of questionable validity), ATA urges further relaxation of the rule to unburden narrow-body intercontinental operations from the 4-hour TWA provision. AIA also comments that the TWA should be eliminated based on Report No. FAA-AM-80-16.

The FAA did not grant that portion of the ATA petition which requested relaxation of the rules for aircraft such

as the B-727 because flight segments of these narrow-body turbojet airplanes which exceed 4 hours comply with the requirements of § 121.578 without installation of ozone filters provided the airplanes do not exceed FL 390 over the continental United States (excluding Alaska). (Higher altitudes may be used in many cases as shown in Table 2 of the NPRM.) On the other hand, flights over Western North America at latitudes higher than the continental United States, almost exclusively Alaskan operations, during the months of February, March, and April could not utilize the highest possible altitude and be in compliance with § 121.578. During that 3-month period, those Alaskan operations could incur a minimal economic burden in the form of reduced fuel efficiency of less than 1 percent. For those few flights which might encounter elevated ozone levels, the public benefit of ozone avoidance outweighs the burden imposed on the operator.

Report No. FAA-AM-80-16 does not indicate that the TWA standard should be discontinued, as suggested by the commenters. The report does state in part, that ozone concentration is more important than duration of exposure in determining the effectiveness of an ozone exposure (dose). This is interpreted to mean that peak concentrations are more important than the duration of exposure in assessing ozone-induced symptoms, and a time-weighted average may not give an accurate index of exposure without due consideration being given to peak exposures. The FAA has already taken this fact into account by having a higher standard for the maximum value than for the TWA.

In the NPRM, the FAA announced that it would allow the use of a value of 0.7 for aircraft without a measured ozone retention ratio, based on its review of recently established ratios for a number of aircraft. AIA comments that aircraft without a measured retention ratio should be allowed to use a value of 0.6 rather than 0.7 based on an average retention ratio in measured aircraft of 0.504, which it computes from Table 1 of the NPRM.

One carrier comments that Table 2 of the NPRM should be increased to show retention ratios and altitudes for all aircrafts operating above FL 250. Such an addition to the table, however, would be impractical and unnecessary.

Although the data was measured only on the aircraft types listed in Table 1 of the proposal, other aircraft types should use the data provided in Table 2 for a retention ratio of 0.7 which is an

acceptable value to use if the actual ratio has not been measured.

The FAA-accepted retention ratio of 0.7 is considered reasonable. One airplane listed in Table 1 has a retention ratio of 0.59, and the B-747SP had a retention ratio of 0.83 before the air conditioning system was reconfigured. Thus, lowering the accepted retention ratio to 0.6 for use in any airplane type without a measured value would not provide for an adequate margin of error. Moreover, using this retention ratio, all but a minimal number of flights can show compliance without restricting altitude or installing ozone filters.

The Independent Union of Flight Attendants (IUFA) states that the flight crewmembers of cargo aircraft should be protected from the health hazard of ozone. The FAA recognizes that high ozone levels are a health hazard. However, as stated in the proposal, flight crewmembers of cargo-only aircraft have protection. The availability of supplemental oxygen and the sedentary activity of cargo-only aircraft occupants reduce or eliminate the physiological impact of exposure to high ozone concentrations. The safety of the aircraft and its occupants can be assured.

IUFA, the Air Line Pilots Association (ALPA), and the Association of Flight Attendants (AFA) comment that cargo-only aircraft should be excluded only if ozone monitors are required equipment on the aircraft. With respect to requiring ozone monitors on cargo-only aircraft, such action is not justified based on costs associated with equipment purchase and maintainability. Because persons aboard cargo-only aircraft are normally sedentary and have supplemental oxygen available in the event symptoms of ozone discomfort are experienced, the benefit of monitoring would be minimal.

ALPA and AFA oppose the exemption of cargo-only airplanes based on their opinion that flight planning is not acceptable and that operational avoidance is not a dependable alternative. In addition, they request that the ozone concentration limits be changed to 0.05 ppmv as an action point, 0.1 ppmv for a threshold, and 0.3 ppmv as a never-to-be-exceeded level.

Proper flight planning and in-flight procedures are recommended practices to reduce exposure by aircraft occupants to high ozone concentration. Moreover, as indicated by Table 2 of the NPRM, ozone avoidance through flight planning is only necessary in a small number of cases and for few months each year.

A tightening of the ozone concentration limits is not justified.

Those limits are based on studies conducted by the FAA Civil Aeromedical Institute and are comparable to standards adopted by the Environmental Protection Agency and the Occupational Safety and Health Administration.

British Aerospace (BA) comments that the permissible maximum ozone concentration is 0.25 ppmv "at any time" as stated in the proposal while the rule uses the phrase "at any point in time." Thus, taken literally, "at any point in time" would require infinitely rapid instrumentation response. BA recommends that the rule be changed to allow the ozone concentration to exceed 0.25 ppmv for 2 minutes. BA also comments that for "altitude restrictions for flights under 4 hours," the retention ratio does not take into account the dissociation within the cabin. Accordingly, BA requests that retention ratio be defined to take into consideration the ozone concentration existing within the occupied space and not be limited to ozone which enters the airplane cabin during flight.

The meaning of the rule is not changed by dropping the words "point in." Ozone monitoring equipment is not required. Thus, this provision should not raise the problem addressed by the commenter because no requirement exists for onboard ozone monitors. Compliance with these rules may be shown by statistical means. In addition, measured retention ratios accepted by the FAA use an airplane cabin average value, not the ozone as it enters the airplane. Thus, it is unnecessary to define retention ratio as the commenter suggests.

Economic Evaluation

These amendments clarify and modify Cabin Ozone Contamination Rules. These amendments specifically relieve two types of operators, those that operate cargo-only aircraft and those that operate certain narrow-body four-engine aircraft. Operators would not have to install ozone filters in these aircraft. So the rule will initially save up to \$1.4 million for the cargo-only operators and \$750,000 for the narrow-body four-engine aircraft, for a total saving of \$2,150,000. Recurring costs saved are about one-third of that, or \$700,000 annually. These benefits are savings for not having to comply with the regulations as they were before these amendments. There are no costs to society or air carriers for adopting these amendments.

List of Subjects

14 CFR Part 25

Air transportation, Aircraft, Aviation safety, Safety.

14 CFR Part 121

Aviation safety, Safety, Air carriers, Air transportation, Aircraft, Transportation, Common carriers.

Adoption of the Amendment

Accordingly, the regulations (14 CFR Parts 25 and 121) are amended, effective January 31, 1983 as follows:

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. By revising § 25.832(a), (1), and (2) to read as follows:

§ 25.832 Cabin ozone concentration.

(a) The airplane cabin ozone concentration during flight must be shown not to exceed—

(1) 0.25 parts per million by volume, sea level equivalent, at any time above flight level 320; and

(2) 0.1 parts per million by volume, sea level equivalent, time-weighted average during any 3-hour interval above flight level 270.

PART 121—CERTIFICATION AND OPERATIONS: DOMESTIC FLAG, AND SUPPLEMENTAL AIR CARRIERS AND COMMERCIAL OPERATORS OF LARGE AIRCRAFT

2. By amending § 121.578 by revising (b) and by adding a new paragraph (e) to read as follows:

§ 121.578 Cabin ozone concentration.

(b) Except as provided in paragraphs (d) and (e) of this section, no certificate holder may operate a transport category airplane above the following flight levels unless it is successfully demonstrated to the Administrator that the concentration of ozone inside the cabin will not exceed—

(1) For flight above flight level 320, 0.25 parts per million by volume, sea level equivalent, at any time above that flight level; and

(2) For flight above flight level 270, 0.1 parts per million by volume, sea level equivalent, time-weighted average for each flight segment that exceeds 4 hours and includes flight above that flight level. (For this purpose, the amount of ozone below flight level 100 is considered to be zero.)

(e) A certificate holder need not comply with the requirements of paragraph (b) of this section for an aircraft—

(1) When the only persons carried are flight crewmembers and persons listed in § 121.583;

(2) If the aircraft is scheduled for retirement before January 1, 1985; or

(3) If the aircraft is scheduled for re-engining under the provisions of Subpart E of Part 91, until it is re-engined.

(Secs. 313, 601, 603, and 604, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354, 1421, 1423, and 1424); sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c))

Note.—These amendments relieve certain operators of large transport category aircraft of the economic burden of purchasing, installing, and maintaining ozone control equipment on some airplanes or establishing ozone avoidance procedures. Accordingly, the FAA has determined that this document involves a final rule which is not major under Executive Order 12291 or significant under DOT Regulatory Policies and Procedures (14 CFR 11034; February 26, 1979). For this same reason and because the operating rule changed by this amendment does not, for the most part, apply to operations by small entities, and the change in the certification rule will have only a minimal effect on the price of certain transport category aircraft that might be purchased by small entities, it

is certified that under the criteria of the Regulatory Flexibility Act, this final rule will not have a significant economic impact on a substantial number of small entities. A copy of the regulatory evaluation for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

Issued in Washington, D.C., on December 3, 1982.

J. Lynn Helms,
Administrator.

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