

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR parts 11, 21, 23, 25, 33, 34, 43, 45, 91

[Docket No. 25613; Amdt. Nos. 11-34, 21-68, 23-40, 25-70, 33-14, 43-33, 45-20, 91-218]

RIN 2120-AC62

Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This final rule codifies as new part 34 all of the applicable aircraft engine fuel venting and exhaust emission requirements of Special Federal Aviation Regulation (SFAR) 27-5, and the test procedures specified under the regulations implementing the Clean Air Act. This rule consolidates all of the requirements and test procedures into this part, and inserts into other affected parts the requirements to comply with new part 34. New part 34 does not alter any of the requirements specified under SFAR 27-5 or the regulations implementing the Clean Air Act.

EFFECTIVE DATES: This regulation is effective September 10, 1990. The incorporation by reference of certain publications listed in the regulations was previously approved by the Director of the Federal Register on November 22, 1983 (48 FR 56740, December 23, 1983).

FOR FURTHER INFORMATION CONTACT: Harvey Van Wyen, Research and Engineering Branch (AEE-110), Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591, Telephone: (202) 267-3558.

SUPPLEMENTARY INFORMATION: This rule replaces SFAR 27-5 with a new Federal Aviation Regulation part 34 as authorized by section 232 of the Clean Air Act, as amended (42 U.S.C. 7401) (the Act) and by the authority delegated to the Administrator of the FAA by the Secretary of Transportation. This rule also amends references to SFAR 27-5 in other parts of the FARs (parts 11, 21, 43, 45, and 91). References to new part 34 will be added to parts 23, 25, and 33 of the FARs. This codification of SFAR 27-5 and 40 CFR part 87 is based on Notice No. 88-9 (53 FR 18530, May 23, 1988). Comments were invited. All comments received have been considered in the issuance of this final rule.

Synopsis of the Proposal

Overview

When the Environmental Protection Agency (EPA) originally issued 40 CFR part 87, Control of Air Pollution from Aircraft and Aircraft Engines; Emission Standards and Test Procedures in 1973, it was recognized that some portions of the standards could be implemented in a very short time period while other portions would require a much longer time period for development and testing. In accordance with section 232 of the Clean Air Act, as amended (42 U.S.C. 7401), the FAA proceeded to promulgate compliance regulations for the near-term requirements in the form of a Special Federal Aviation Regulation, SFAR 27-5. Subsequent to the original issuance of 40 CFR part 87, the EPA has recognized that some of the longer-term requirements were either unneeded or practically unattainable. Those longer-term requirements, originally scheduled to become effective in 1978, have been extensively revised by the EPA. Revised 40 CFR part 87 now contains all current aircraft and aircraft engine emission standards. Under the requirement of section 232 of the Clean Air Act Amendments of 1970, the FAA has promulgated, in SFAR 27-5, compliance regulations for all of the standards in 40 CFR part 87.

By this rulemaking, the FAA will continue to comply with section 232 of the Clean Air Act Amendments of 1970 by establishing a new part 34 to 14 CFR containing all of the compliance regulations for fuel venting and engine exhaust emissions. This rule also revises other affected parts to require compliance with part 34. Since SFAR 27-5 and its amendments were issued, they have, by definition, been considered temporary, and their exact status has been confusing to the parties directly or indirectly affected by the regulations. The other parts directly affected by SFAR 27-5 have heretofore referenced only SFAR 27-5 and the reader has been required to review SFAR 27-5 in its entirety in order to determine its effect on other parts. The FAA, with this final rule, codifies the compliance regulations in a single part of the Federal Aviation Regulations, and revises the other affected parts accordingly.

The provisions of 40 CFR part 87 are applicable to each individual aircraft gas turbine engine of the classes, and as of dates, specified in that part. Compliance would require exhaust emission testing of each individual engine that is subject to the requirements of 40 CFR part 87. The EPA has recognized in the preamble to 40

CFR part 87, and specifically in § 87.89, that testing each individual engine would be excessively costly.

The EPA concluded that it was necessary to develop a practical interpretation of the requirement for demonstrated compliance by each individual engine and to substitute a preproduction certification program as a compliance procedure in place of compliance testing. The promulgation of such a preproduction certification compliance program has been delegated to the FAA subject to the concurrence of the Administrator of the EPA. The FAA consulted extensively with the EPA on this matter. The EPA concluded that an acceptable preproduction certification compliance program must demonstrate that, at minimum, with 90 percent confidence, 95 percent of the engines would meet the gaseous emission standards, and with 90 percent confidence, every engine would meet the smoke standards. The International Civil Aviation Organization (ICAO), in its Standards and Recommended Practices for Aircraft Engine Emissions, adopted a similar preproduction certification compliance procedure based upon a composite of historical engine-to-engine variability. Since the EPA stressed the desirability of commonality with ICAO, the FAA, with the concurrence of the EPA, adopted the compliance procedure defined in Appendix 6 to ICAO Annex 16, Volume II—Aircraft Engine Emissions, First Edition, June 1981.

The FAA solicited comments and recommendations concerning equivalent procedures in a Notice of Proposed Rulemaking (53 FR 18530, May 23, 1988). No comments were received on the equivalent procedures issue. The FAA will give any future recommendation full consideration if it is accompanied by substantive supporting data demonstrating equivalency. Should an acceptable equivalent procedure be proposed, the FAA will seek EPA concurrence with that proposed equivalent procedure as an alternative compliance procedure. The FAA cannot, however, adopt any proposed compliance procedure unless it has the concurrence of the Administrator of the EPA.

Regulatory History

Under section 232 of the Clean Air Act Amendments of 1970, Public Law 91-604, the FAA is required to issue regulations that ensure compliance with all aircraft emission standards promulgated under section 231 of the Act, which are currently prescribed in 40 CFR part 87 originally issued on July 6, 1973 (38 FR

19088, July 17, 1973). Accordingly, on December 26, 1973, the FAA issued SFAR 27, (38 FR 35427, December 28, 1973). The purpose of SFAR 27 was to ensure compliance with the aircraft and aircraft engine emission standards and test procedures issued by the EPA in 40 CFR part 87.

SFAR 27, as originally issued, required compliance only with those standards and procedures in 40 CFR part 87 that were effective beginning February 1, 1974. Since its issuance, SFAR 27 has been amended seven times by the FAA. On December 23, 1974, the FAA issued SFAR 27-1 (39 FR 45008, December 30, 1974) to require compliance with the fuel venting emission standards in 40 CFR part 87 that became effective January 1, 1975. SFAR 27-2, effective January 1, 1976 (40 FR 55311, November 28, 1975), required compliance with smoke emissions standards in 40 CFR part 87 applicable to new and in-use aircraft turbofan or turbojet engines with a rated power of 29,000 pounds thrust or greater that are designed for operation on subsonic airplanes. SFAR 27-3 (42 FR 64876, December 29, 1977) required compliance with smoke emission standards in 40 CFR part 87 for JT3D engines manufactured on and after January 1, 1978. A fourth amendment, SFAR 27-4 (45 FR 71960, October 30, 1980), was issued to require phased compliance with smoke emission standards by in-use JT3D engines beginning on January 1, 1981, with total compliance required by January 1, 1985. Subsequently, the requirement for compliance by in-use JT3D engines was automatically deleted under the terms of SFAR 27, § 3(b), when the EPA deleted underlying requirement from 40 CFR part 87 (48 FR 2716, January 20, 1983).

On December 21, 1982, the EPA revised 40 CFR part 87 and republished the rule in its entirety (47 FR 58462, December 30, 1982). The revised rule contained a number of changes in definitions as well as new standards for smoke and unburned hydrocarbon emissions. The FAA is required by 40 CFR 87.89 to establish and approve a testing program to assure compliance with part 87 by January 1, 1984. On December 8, 1983, the FAA issued amended SFAR 27-5 (48 FR 56735, December 23, 1983) which required compliance with all of the provisions of revised 40 CFR part 87 and contained an EPA-approved testing program. The effective date of SFAR 27-5 was January 1, 1984. On October 4, 1983, the EPA issued a stay of the January 1, 1984, effective date for EPA's smoke standards, applicable to aircraft turbine engines rated below 26.7 kilonewtons

(kN) (6000 pounds) thrust in response to a petition by the General Aviation Manufacturers Association (GAMA) (48 FR 46481, October 12, 1983). On July 30, 1984, the EPA denied the GAMA petition and established an August 9, 1985 effective date for smoke standards applicable to aircraft turbine engines rated below 26.7 kN (49 FR 31873, August 9, 1984). On October 9, 1984, the EPA changed the definition of "very low production" engines in the provisions for exemptions and revised the exhaust emission test fuel specification (49 FR 41000, October 18, 1984). On March 18, 1986, the FAA amended SFAR 27-5 to correct the authority citations for petitions for exemptions to SFAR 27-5 (51 FR 10612, March 28, 1986). On September 15, 1989, the FAA amended SFAR 27-5 to reflect delegations of authority that were affected by a recent agencywide reorganization (54 FR 39288, September 25, 1989).

Discussion of Comments

A total of seven written responses containing comments were received by the FAA subsequent to the publication of Notice 88-9. All of the comments submitted to the docket have been reviewed. The proposed amendments to parts 11, 21, 23, 25, 33, 45 and 91 and the new part 34 have been revised to reflect those relevant comments and suggestions within the scope of Notice 88-9.

Many of the comments regarding technical amendments to parts 11, 21, 23, 25, 33, 45 and 91 were found to be of sufficient merit to warrant revisions to the final rule. Those comments recommending substantive changes to part 34 were not adopted, since part 34 is restricted to the direct implementation of 40 CFR part 87 which was promulgated by the EPA. The substantive portion of part 34 is intended to be essentially a word-for-word reproduction of the substantive portions of 40 CFR part 87. Future comments regarding the substantive aspects of 40 CFR part 87 should be addressed to the EPA.

Comments pertaining to amending parts 11, 21, 23, 25, 33, 45 and 91:

One commenter noted that the proposed change in § 23.903(a)(1) and a similar change in § 25.903(a)(1) were inconsistent with a previous broad revision for all categories of aircraft which introduced a common requirement with the words "Each engine must have a type certificate." The commenter noted that the wording as stated in the NPRM would exclude engines certificated on the basis of Civil Air Regulation 13 (the predecessor to the present FAR part 33) and all engines

certificated under the provisions of § 21.29. The commenter's proposed wording also addresses another commenter's concern that the requirement for the certification of each engine under part 34 should be restated to emphasize that the requirement is in effect only when part 34 is applicable to that particular engine. The wording proposed by the commenter was adopted for §§ 23.903(a)(1) and 25.903(a)(1) of the final rule.

Regarding the proposed changes to §§ 23.951(d) and 25.951(d), two commenters noted that the requirements of parts 23 and 25 apply to the airplane, not the engines. The proposed change offered by one of the commenters was adopted in the final rule by changing the phrase "Each fuel system for a turbine engine must * * * " to the phrase "Each fuel system for a turbine engine powered airplane must * * * ".

One commenter noted that although the NPRM proposed to amend 14 CFR parts 11, 21, 23, 45 and 91 and add a new part 34, there was no corresponding change proposed for part 33 requiring the applicant for a certification under part 21 to show compliance with the applicable requirements of part 34. The FAA concurs with the comment and has added an appropriate revision to part 33 in the final rule.

One commenter noted that the proposed wording in the NPRM for § 45.13(a)(7) and 45.13(a)(7)(i) is inconsistent with the current practice that engines that do not have gaseous or exhaust smoke emission standards imposed by 40 CFR part 87, namely turboprop (Class TP) engines of less than 1000 kW rated power, do not need to indicate any information on emissions on their identification plates. The commenter recommended adding the words "exhaust emissions" to the first sentence in § 45.13(a)(7) as follows: "* * * indicates compliance with the applicable exhaust emissions provisions of part 34 * * * ". A similar change was recommended for § 45.13(a)(7)(i). These minor clarifications were adopted by the FAA in the final rule. The same commenter also suggested that the requirements for a "permanent powerplant record" under § 45.13(a)(7)(i) and (ii) be changed to "engine logbook". The suggestion was not adopted in the final rule. The FAA does not have a requirement for an "engine logbook" nor could the FAA determine that "engine logbook" was an industry standard or custom. Therefore, the generic term "permanent powerplant record" was kept in the final rule.

One commenter suggested that as a matter of practical convenience the

proposed requirement for 14 CFR 91.27(d) commence as follows: [14 CFR part 91 will be completely revised as of August 18, 1990 (see 54 FR 34284, August 18, 1990) to renumber all of its sections. Section 91.27 will be renumbered as § 91.203 and § 91.28 will be renumbered as § 91.715. Hereafter in this preamble, references to the renumbered Part 91 will be shown in brackets.] "Except as provided in § 91.28 [91.715], no person * * * ", and that § 91.28 [91.715] be amended to reflect the exhaust emission exemption of 40 CFR 87.7, as is currently provided for certificates of airworthiness in § 91.28(a) [91.715(a)]. The recommendation was not adopted in the final rule. Part 87 allows for an exemption for airplanes that do not comply with emission standards when operated on flights of short duration or at infrequent intervals. These exemptions from emission compliance are not as broad as those exemptions allowed for airworthiness under § 91.28 [91.715]. Part 34 does and must reflect the requirements of 40 CFR 87.7.

Comments Pertaining to the New Part 34

Based on the comments received, a definition for "reference day conditions" was added to § 34.1, and § 34.1 definitions for "date of manufacture," "aircraft," and "Administrator" were amended for clarity or to conform with an existing definition of the term in use in the FARs.

Several of the comments pertained to typographical errors in the NPRM and the inclusion of additional terms in the abbreviations table in § 34.2. The commenters' recommended changes were adopted in the final rule.

Regarding the proposed § 34.60(b), a commenter suggested that the requirement to use a dynamometer for engines producing shaft power is unduly restrictive. The commenter stated that acceptance testing of most new turboprop engines is done using a propeller with either a calibrated test-stand torque meter or the engine's integral torque measuring device. The commenter concluded that if these devices are acceptable to the FAA for determining an engine's power output they should be equally acceptable for the part 34 tests. The comment was not adopted in the final rule. The requirement for the dynamometer was established by the EPA in 40 CFR 87.60(b). The FAA may, however, approve alternative test procedures under the provisions of § 34.3(a) or § 34.5 if proper applications are submitted. Part 34 reflects, and must continue to reflect, the requirements of 40 CFR part 87.60(b).

One commenter indicated that the turbine fuel specifications contained in proposed § 34.61 are not consistent with the latest American Society for Testing Materials (ASTM) recommendations. In response, the FAA notes that the EPA initially adopted the turbine fuel specifications identical to those contained in appendix 4 of Volume 2 of ICAO Annex 16. However, after much consideration, the EPA subsequently revised the fuel specifications (47 FR 58462, December 30, 1982). As required, 14 CFR part 34 must directly adopt the revised EPA fuel specification (with the exception of a correction of a typographical error in the units of measure for kinematic viscosity). It should be noted that § 34.61 fuel specifications are more stringent than the fuel specifications in appendix 4 of Volume 2 of ICAO Annex 16.

Section 34.7 states that all petitions for rulemaking involving either the substance of an emission standard or test procedure prescribed by the EPA, or a compliance date for such standard or procedure, must be submitted to the EPA. As stated in the NPRM (53 FR 18530, May 23, 1988), informational copies of such petitions are invited by the FAA. One commenter wrote that to invite rather than require is ambiguous and would set an undesirable precedent. The commenter concluded that if copies of the petition are not required, the provision to invite informational copies of the petition should be removed from the regulation. The commenter's suggestion has not been adopted in the final rule. The FAA feels that the invited information copies will expedite the required consultation process between the FAA and the EPA in order to determine if action on such petitions requires rulemaking under sections 231 and 232 of the Clean Air Act, as amended.

One commenter was concerned that the fuel venting and exhaust emission requirements of part 34 would be applied to auxiliary power unit (APU) installations through the requirements of parts 23 and 25. The EPA proposed to withdraw emission control requirements from APU's in 1978 (43 FR 12615, March 24, 1978) and omitted APU emission control requirements from their final rule (47 FR 58462, December 30, 1982). Therefore, the FAA does not intend to impose part 34 requirements on APU's.

A commenter suggested that where engine power is expressed in kilonewton(s), the equivalent in pounds of thrust should also be shown. The suggestion has merit and was adopted in the final rule.

Several commenters suggested changes in the arrangement of part 34 sections and deletion of certain wording as a means of simplifying part 34 without affecting the content of 40 CFR part 87. The suggestions were not adopted in the final rule. The FAA chose to incorporate, to the maximum extent possible, the substantive portions of 40 CFR part 87 into 14 CFR part 34 on a word-for-word and section-to-section basis in order to maintain consistency between the two bodies of rules.

One commenter requested assurance from the FAA that the new part 34 would not place any new or additional regulatory burden on owners/operators of in-use JT3D engines manufactured before 1978. New part 34 is intended to codify only the provisions of Special Federal Aviation Regulation (SFAR) 27-5, and the EPA standards and test procedures contained in 40 CFR part 87. New part 34 does not place any new or additional regulatory burden on owners/operators of any aircraft or aircraft engines; it merely recodifies the existing rules of SFAR 27 and 40 CFR part 87. This includes in-use JT3D engines manufactured before 1978. There is no requirement in new part 34 to retrofit in-use JT3D engines manufactured before 1978.

Paperwork Reduction Act

Information collection requirements contained in SFAR 27-5 were approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980 (Pub. L. 96-511) and was assigned OMB control number 2120-0508. That control number will be designated for §§ 34.7 and 45.13, as listed in § 11.101(a).

Regulatory Evaluation

The FAA has reviewed the final rule establishing the new part 34, "Fuel Venting and Exhaust Emission Requirements for Turbine Powered Airplanes," to determine what, if any, economic impact it will have on the aviation industry. The FAA concludes that part 34 will not have a significant economic impact on the aviation industry and that it does not constitute a major rule pursuant to Executive Order 12291.

Section 232 of the Clean Air Act Amendments of 1970, Public Law 91-604, requires the FAA to issue regulations that ensure compliance with all aircraft emissions standards promulgated under section 231 of the Clean Air Act, which are currently prescribed in 40 CFR part 87. These standards and their applicability are clearly defined in 40

CFR part 87, and the FAA has no option but to enforce them.

As part of the process of promulgating 40 CFR part 87, the EPA conducted an economic analysis of the proposed regulations and determined that they would not constitute a major rule, as defined by Executive Order 12291 (47 FR 58469, December 30, 1982). This determination was based on the expected economic impact being well below the \$100 million per year threshold set forth in the Executive Order, and the expectation that the rules would not impose significantly increased costs or other adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S. enterprises to compete with those of other countries. The EPA's economic analysis containing this determination can be found in Public Docket Number OMSAPC-78-1, which may be examined at the Environmental Protection Agency, Central Docket Section, West Tower Lobby, Gallery I, 401 M Street SW., Washington, DC 20406. A copy of the EPA's economic analysis has also been placed in Docket 25613 for the convenience of those interested in reviewing it. The FAA has reviewed and concurs with the findings in the EPA economic analysis.

Following the EPA's revision of 40 CFR part 87, the FAA issued amended SFAR 27-5 (48 FR 56735, December 23, 1983), which required compliance with all of the provisions of 40 CFR part 87. The SFAR was most recently amended on September 15, 1989 (54 FR 39288, September 25, 1989). The purpose of part 34 is to replace SFAR 27-5 as a permanent part in the FAR's and to continue the enforcement of 40 CFR part 87, as required by the statute. This action does not in any way change, add to, or take away from the standards in 40 CFR part 87 or the requirements for compliance currently implemented under SFAR 27-5. Part 34 will not impose any new or additional regulatory requirements. On May 23, 1988, the FAA issued a notice of proposed rulemaking indicating its intention to promulgate part 34. This NPRM contained a regulatory evaluation asserting that no new or additional cost burdens would be imposed by the new regulation. No comments were submitted in Docket 25613 disputing this assertion. Therefore, the FAA is assured that no new or additional cost burden will result from the promulgation of this regulation.

Part 34 is easier to review and understand than SFAR 27-5. Thus, persons affected by 40 CFR part 87 will be relieved from a burden and a slight, unquantifiable benefit will result from

this action. Because this beneficial economic impact is considered minimal, the FAA determines that no further analysis is necessary. Accordingly, the FAA concludes that this rulemaking action will not have a significant economic impact on the aviation industry and that it does not constitute a major rule pursuant to Executive Order 12291.

International Trade Impact Analysis

Part 34 will neither eliminate any present regulation nor impose any new regulation. As a result, affected operators will not incur additional costs or significant costs savings. Thus, part 34 will not have any impact on trade opportunities for either U.S. firms doing business overseas or foreign firms doing business in the United States.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 was enacted to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The Act requires a Regulatory Flexibility Analysis if a rule has a significant economic impact, either detrimental or beneficial, on a substantial number of small business entities. As noted above, part 34 will neither eliminate any present regulations nor impose any new regulations and, thus, will not have a significant economic impact, either detrimental or beneficial, on affected operators. Consequently, the FAA determines that, under the criteria of the Regulatory Flexibility Act of 1980, a regulatory flexibility analysis is not required.

Environmental Analysis

Pursuant to Department of Transportation, "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1D, appendix 7, paragraph 4, change 3, December 5, 1986), the FAA is categorically excluded from providing an environmental analysis with regard to part 34 because it is mandated by law to issue regulations to ensure compliance with the EPA aircraft emissions standards and the EPA has performed all required environmental analyses prior to the issuance of those standards.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance

with Executive Order 12612, it is determined that this final rule will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

The FAA has determined that this document involves regulations which are not considered to be major under the procedures and criteria prescribed in Executive Order 12291. The rule is considered not significant under to Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). A copy of the evaluation prepared for this action is contained in the regulatory docket. A copy of the evaluation may be obtained from the person identified in the section entitled "**FOR FURTHER INFORMATION CONTACT.**" For the reasons stated in the regulatory evaluation, I certify that these regulations, if promulgated, will not have a significant economic impact on a substantial number of small entities. In addition, these proposals, if adopted, would have little or no impact on trade opportunities for U.S. firms doing business overseas or for foreign firms doing business in the United States.

List of Subjects

14 CFR Parts 11, 21, 23, 25, 33, 43, 45, and 91

Air transportation, Aircraft, Aviation safety.

14 CFR Part 34

Air pollution control, Aircraft, Incorporation by reference.

The Final Rule

Accordingly, the FAA amends 14 CFR, chapter I, by amending parts 11, 21, 23, 25, 33, 43, 45, and 91, and adding a new part 34 as follows:

PART 11—GENERAL RULE-MAKING PROCEDURES

1. The authority citation for part 11 continues to read as follows:

Authority: 49 U.S.C. 1341(a), 1343(d), 1348, 1354(a), 1401 through 1405, 1421 through 1431, 1481, 1502; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

2. By removing SFAR 27-5.

§ 11.101 [Amended]

3. In § 11.101(a), by removing from the chart the reference and control number for SFAR 27; and by inserting into the chart the following references:

§ 34.7 2120-0508.

§ 45.13 2120-0508.

PART 21—CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS

4. The authority citation for part 21 is revised to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 7572; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

5. By removing SFAR 27-5.

6. In § 21.17, paragraph (a) introductory text is revised to read as follows:

§ 21.17 Designation of applicable regulations.

(a) Except as provided in § 23.2, § 25.2, and in parts 34 and 36 of this chapter, an applicant for a type certificate must show that the aircraft, aircraft engine, or propeller concerned meets—

7. In § 21.21, paragraph (b) introductory text and (b)(1) are revised to read as follows:

§ 21.21 Issue of type certificate: normal, utility, acrobatic, commuter, and transport category aircraft; aircraft engines; propellers.

(b) The applicant submits the type design, test reports, and computations necessary to show that the product to be certificated meets the applicable airworthiness, aircraft noise, fuel venting, and exhaust emission requirements of the Federal Aviation Regulations and any special conditions prescribed by the Administrator, and the Administrator finds—

(1) Upon examination of the type design, and after completing all tests and inspections, that the type design and the product meet the applicable noise, fuel venting, and emissions requirements of the Federal Aviation Regulations, and further finds that they meet the applicable airworthiness requirements of the Federal Aviation Regulations or that any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety; and

8. In § 21.29, paragraph (a)(1)(i) and (b) are revised to read as follows:

§ 21.29 Issue of type certificate: import products.

(a) * * *
(1) * * *

(i) The applicable aircraft noise, fuel venting and exhaust emissions requirements of this subchapter as designated in § 21.17, or the applicable

aircraft noise, fuel venting and exhaust emissions requirements of the country in which the product was manufactured, and any other requirements the Administrator may prescribe to provide noise, fuel venting and exhaust emission levels no greater than those provided by the applicable aircraft noise, fuel venting, and exhaust emission requirements of this subchapter as designated in § 21.17; and

(b) A product type certificated under this section is considered to be type certificated under the noise standards of part 36, and the fuel venting and exhaust emission standards of part 34, of the Federal Aviation Regulations where compliance therewith is certified under paragraph (a)(1)(i) of this section, and under the airworthiness standards of that part of the Federal Aviation Regulations with which compliance is certified under paragraph (a)(1)(ii) of this section or to which an equivalent level of safety is certified under paragraph (a)(1)(ii) of this section.

9. In § 21.31, paragraph (d) is revised to read as follows:

§ 21.31 Type design.

(d) Any other data necessary to allow, by comparison, the determination of the airworthiness, noise characteristics, fuel venting, and exhaust emissions (where applicable) of later products of the same type.

10. In § 21.33, paragraph (b)(1) is revised to read as follows:

§ 21.33 Inspection and tests.

(b) * * *
(1) Compliance with the applicable airworthiness, aircraft noise, fuel venting, and exhaust emission requirements;

11. In § 21.93, paragraph (c) is added to read as follows:

§ 21.93 Classification of changes in type design.

(c) For purposes of complying with part 34 of this chapter, any voluntary change in the type design of the airplane or engine which may increase fuel venting or exhaust emissions is an "emissions change."

12. In § 21.101, paragraph (a) introductory text is revised to read as follows:

§ 21.101 Designation of applicable regulations.

(a) Except as provided in § 23.2 and § 25.2 and parts 34 and 36 of this chapter, an applicant for a change to a

type certificate must comply with either—

13. In § 21.115, paragraph (a) is revised to read as follows:

§ 21.115 Applicable requirements.

(a) Each applicant for a supplemental type certificate must show that the altered product meets applicable airworthiness requirements as specified in paragraphs (a) and (b) of § 21.101 and, in the case of an acoustical change described in § 21.93(b), show compliance with the applicable noise requirements of § 36.7 and § 36.9 of this chapter and, in the case of an emissions change described in § 21.93(c), show compliance with the applicable fuel venting and exhaust emissions requirements of part 34.

14. In § 21.183, paragraph (g) is added to read as follows:

§ 21.183 Issue of standard airworthiness certificates for normal, utility, acrobatic, commuter, and transport category aircraft; manned free balloons; and special classes of aircraft.

(g) *Fuel venting and exhaust emission requirements.* Notwithstanding all other provisions of this section, and irrespective of the date of application, no airworthiness certificate is issued, on and after the dates specified in part 34 for the airplanes specified therein, unless the airplane complies with the applicable requirements of that part.

15. In § 21.187 paragraph (c) is added to read as follows:

§ 21.187 Issue of multiple airworthiness certification.

(c) The aircraft complies with the applicable requirements of part 34.

16. Section 21.257 is revised to read as follows:

§ 21.257 Type certificates: Issue.

An applicant is entitled to a type certificate for a product manufactured under a delegation option authorization if the Administrator finds that the product meets the applicable airworthiness, noise, fuel venting, and exhaust emission requirements (including applicable acoustical change or emissions change requirements in the case of changes in type design).

17. In § 21.451, paragraph (d) is revised to read as follows:

§ 21.451 Limits of applicability.

(d) Notwithstanding any other provision of this subpart, a DAS may not issue a supplemental type certificate

involving the exhaust emissions change requirements of part 34 or the acoustical change requirements of part 36 of this chapter until the Administrator finds that those requirements are met.

PART 23—AIRWORTHINESS STANDARDS: NORMAL, UTILITY, ACROBATIC, AND COMMUTER CATEGORY AIRPLANES

18. The authority citation for part 23 continues to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1425, 1428, 1429, 1430; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

19. In § 23.903, paragraph (a)(1) is revised to read as follows:

§ 23.903 Engines.

(a) * * *

(1) Each engine must have a type certificate and must meet the applicable requirements of part 34 of this chapter.

20. In § 23.951, paragraph (d) is added to read as follows:

§ 23.951 General.

(d) Each fuel system for a turbine engine powered airplane must meet the applicable fuel venting requirements of part 34 of this chapter.

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

21. The authority citation for part 25 continues to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1424, 1425, 1428, 1429, 1430; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

22. In § 25.903, paragraph (a)(1) is revised to read as follows:

§ 25.903 Engines.

(a) * * *

(1) Each engine must have a type certificate and must meet the applicable requirements of part 34 of this chapter.

23. In § 25.951, paragraph (d) is added to read as follows:

§ 25.951 General.

(d) Each fuel system for a turbine engine powered airplane must meet the applicable fuel venting requirements of part 34 of this chapter.

PART 33—AIRWORTHINESS STANDARDS: AIRCRAFT ENGINES

24. The authority citation for part 33 continues to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1424, 1425; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 22, 1983).

25. In § 33.1, paragraph (b) is revised to read as follows:

§ 33.1 Applicability.

(b) Each person who applies under part 21 for such a certificate or change must show compliance with the applicable requirements of this part and the applicable requirements of part 34 of this chapter.

PART 43—MAINTENANCE, PREVENTIVE MAINTENANCE, REBUILDING, AND ALTERATION

26. The authority citation for part 43 continues to read as follows:

Authority: 49 U.S.C. 1354, 1421 through 1430; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 22, 1983).

27. By removing SFAR 27-5.

PART 45—IDENTIFICATION AND REGISTRATION MARKETING

28. The authority citation for part 45 continues to read as follows:

Authority: 49 U.S.C. 1348, 1354, 1401, 1402, 1421, 1423, and 1522; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

29. By removing SFAR 27-5.

30. In § 45.13, paragraph (a)(7) is redesignated as paragraph (a)(8) and a new paragraph (a)(7) is added to read as follows:

§ 45.13 Identification data.

(a) * * *

(7) On or after January 1, 1984, for aircraft engines specified in part 34 of this chapter, the date of manufacture as defined in § 34.1 of that part, and a designation, approved by the Administrator of the FAA, that indicates compliance with the applicable exhaust emission provisions of part 34 and 40 CFR part 87. Approved designations include COMPLY, EXEMPT, and NON-US as appropriate.

(i) The designation Comply indicates that the engine is in compliance with all of the applicable exhaust emissions provisions of part 34. For any engine with a rated thrust in excess of 26.7 kilonewtons (6000 pounds) which is not used or intended for use in commercial operations and which is in compliance with the applicable provisions of part 34, but does not comply with the hydrocarbon emissions standard of § 34.21(d), the statement "May not be used as a commercial aircraft engine" must be noted in the permanent powerplant record that accompanies the

engine at the time of manufacture of the engine.

(ii) The designation EXEMPT indicates that the engine has been granted an exemption pursuant to the applicable provision of § 34.7 (a)(1), (a)(4), (b), (c), or (d), and an indication of the type of exemption and the reason for the grant must be noted in the permanent powerplant record that accompanies the engine from the time of manufacture of the engine.

(iii) The designation NON-US indicates that the engine has been granted an exemption pursuant to § 34.7(a)(1), and the notation "This aircraft may not be operated within the United States", or an equivalent notation approved by the Administrator of the FAA, must be inserted in the aircraft logbook, or alternate equivalent document, at the time of installation of the engine.

PART 91—GENERAL OPERATING AND FLIGHT RULES

31. The authority citation for part 91 continues to read as follows:

Authority: 49 U.S.C. 1301(7), 1303, 1344, 1348, 1352 through 1355, 1401, 1421 through 1431, 1471, 1472, 1502, 1510, 1522, and 2121 through 2125; Articles 12, 29, 31, and 32(a) of the Convention on International Civil Aviation (61 Stat. 1180); 42 U.S.C. 4321 et seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

When adopted, the following amendment will be reflected in new part 91 effective on August 18, 1990:

32. By removing SFAR 27-5.

33. In § 91.203, paragraph (d) is added to read as follows:

§ 91.203 Civil aircraft: Certifications required.

(d) No person may operate a civil airplane (domestic or foreign) into or out of an airport in the United States unless it complies with the fuel venting and exhaust emissions requirements of part 34 of this chapter.

34. Part 34 is added to read as follows:

PART 34—FUEL VENTING AND EXHAUST EMISSION REQUIREMENTS FOR TURBINE ENGINE POWERED AIRPLANES

Subpart A—General Provisions

Sec.

34.1 Definitions.

34.2 Abbreviations.

34.3 General requirements.

34.4 [Reserved].

34.5 Special test procedures.

34.6 Aircraft safety.

Sec.

34.7 Exemptions.

Subpart B—Engine Fuel Venting Emissions (New and In-Use Aircraft Gas Turbine Engines)

34.10 Applicability.

34.11 Standard for fuel venting emissions.

Subpart C—Exhaust Emissions (New Aircraft Gas Turbine Engines)

34.20 Applicability.

34.21 Standards for exhaust emissions.

Subpart D—Exhaust Emissions (In-Use Aircraft Gas Turbine Engines)

34.30 Applicability.

34.31 Standards for exhaust emissions.

Subpart E—[Reserved]**Subpart F—[Reserved]****Subpart G—Test Procedures for Engine Exhaust Gaseous Emissions (Aircraft and Aircraft Gas Turbine Engines)**

Sec.

34.60 Introduction.

34.61 Turbine fuel specifications.

34.62 Test procedure (propulsion engines).

34.63 [Reserved]

34.64 Sampling and analytical procedures for measuring gaseous exhaust emissions.

34.65 to § 34.70 [Reserved]

34.71 Compliance with gaseous emission standards.

Subpart H—Test Procedures for Engine Smoke Emissions (Aircraft Gas Turbine Engines)

34.80 Introduction.

34.81 Fuel specifications.

34.82 Sampling and analytical procedures for measuring smoke exhaust emissions.

34.83 to § 34.88 [Reserved]

34.89 Compliance with smoke emission standards.

Authority: 42 U.S.C. 1657f-10; 49 U.S.C. 106(g); 49 U.S.C. App. 1348(c), 1354(a), 1421, 1423.

Subpart A—General Provisions**§ 34.1 Definitions.**

As used in this part, all terms not defined herein shall have the meaning given them in the Clean Air Act, as amended (42 U.S.C. 7401 et. seq.):

Act means the Clean Air Act, as amended (42 U.S.C. 7401 et. seq.).

Administrator means the Administrator of the Federal Aviation Administration or any person to whom he has delegated his authority in the matter concerned.

Administrator of the EPA means the Administrator of the Environmental Protection Agency and any other officer or employee of the Environmental Protection Agency to whom the authority involved may be delegated.

Aircraft as used in this part means any airplane as defined in 14 CFR part 1 for which a U.S. standard airworthiness

certificate or equivalent foreign airworthiness certificate is issued.

Aircraft engine means a propulsion engine which is installed in, or which is manufactured for installation in, an aircraft.

Aircraft gas turbine engine means a turboprop, turbofan, or turbojet aircraft engine.

Class TP means all aircraft turboprop engines.

Class TF means all turbofan or turbojet aircraft engines except engines of Class T3, T8, and TSS.

Class T3 means all aircraft gas turbine engines of the JT3D model family.

Class T8 means all aircraft gas turbine engines of the JT8D model family.

Class TSS means all aircraft gas turbine engines employed for propulsion of aircraft designed to operate at supersonic flight speeds.

Commercial aircraft engine means any aircraft engine used or intended for use by an "air carrier" (including those engaged in "intrastate air transportation") or a "commercial operator" (including those engaged in "intrastate air transportation") as these terms are defined in the Federal Aviation Act and the Federal Aviation Regulations.

Commercial aircraft gas turbine engine means a turboprop, turbofan, or turbojet commercial aircraft engine.

Date of manufacture of an engine is the date the inspection acceptance records reflect that the engine is complete and meets the FAA approved type design.

Emission measurement system means all of the equipment necessary to transport the emission sample and measure the level of emissions. This includes the sample system and the instrumentation system.

Engine model means all commercial aircraft turbine engines which are of the same general series, displacement, and design characteristics and are approved under the same type certificate.

Exhaust emissions means substances emitted into the atmosphere from the exhaust discharge nozzle of an aircraft or aircraft engine.

Fuel venting emissions means raw fuel, exclusive of hydrocarbons in the exhaust emissions, discharged from aircraft gas turbine engines during all normal ground and flight operations.

In-use aircraft gas turbine engine means an aircraft gas turbine engine which is in service.

New aircraft turbine engine means an aircraft gas turbine engine which has never been in service.

Power setting means the power or thrust output of an engine in terms of kilonewtons thrust for turbojet and turbofan engines or shaft power in terms of kilowatts for turboprop engines.

Rated output (rO) means the maximum power/thrust available for takeoff at standard day conditions as approved for the engine by the Federal Aviation Administration, including reheat contribution where applicable, but excluding any contribution due to water injection and excluding any emergency power/thrust rating.

Rated pressure ratio (rPR) means the ratio between the combustor inlet pressure and the engine inlet pressure achieved by an engine operation at rated output.

Reference day conditions means the reference ambient conditions to which the gaseous emissions (HC and smoke) are to be corrected. The reference day conditions are as follows: Temperature = 15°C, specific humidity = 0.00629 kg H₂O/kg of dry air, and pressure = 101325 Pa.

Sample system means the system which provides for the transportation of the gaseous emission sample from the sample probe to the inlet of the instrumentation system.

Shaft power means only the measured shaft power output of a turboprop engine.

Smoke means the matter in exhaust emissions which obscures the transmission of light.

Smoke number (SN) means the dimensionless term quantifying smoke emissions.

Standard day conditions means standard ambient conditions as described in the United States Standard Atmosphere 1976, (i.e., temperature = 15°C, specific humidity = 0.00 kg H₂O/kg dry air, and pressure = 101325 Pa.)

Taxi/idle (in) means those aircraft operations involving taxi and idle between the time of landing roll-out and final shutdown of all propulsion engines.

Taxi/idle (out) means those aircraft operations involving taxi and idle between the time of initial starting of the propulsion engine(s) used for the taxi and the turn onto the duty runway.

§ 34.2 Abbreviations.

The abbreviations used in this part have the following meanings in both upper and lower case:

EPA United States Environmental Protection Agency
 FAA Federal Aviation Administration,
 United States Department of Transportation
 HC Hydrocarbon(s)
 HP Horsepower

hr Hour(s)
 H₂O water
 kg Kilogram(s)
 kJ Kilojoule(s)
 LTO Landing and takeoff
 min Minute(s)
 Pa Pascal(s)
 rO Rated output
 rPR Rated pressure ratio
 sec Second(s)
 SP Shaft power
 SN Smoke number
 T Temperature, degrees Kelvin
 TIM Time in mode
 W Watt(s)
 °C Degrees Celsius
 % Percent

§ 34.3 General requirements.

(a) This part provides for the approval or acceptance by the Administrator or the Administrator of the EPA of testing and sampling methods, analytical techniques, and related equipment not identical to those specified in this part. Before either approves or accepts any such alternate, equivalent, or otherwise nonidentical procedures or equipment, the Administrator or the Administrator of the EPA shall consult with the other in determining whether or not the action requires rulemaking under sections 231 and 232 of the Clean Air Act, as amended, consistent with the responsibilities of the Administrator of the EPA and the Secretary of Transportation under sections 231 and 232 of the Clean Air Act.

(b) Under section 232 of the Act, the Secretary of Transportation issues regulations to ensure compliance with 40 CFR part 87. This authority has been delegated to the Administrator of the FAA (49 CFR 1.47).

(c) *U.S. airplanes.* This Federal Aviation Regulation (FAR) applies to civil airplanes that are powered by aircraft gas turbine engines of the classes specified herein and that have U.S. standard airworthiness certificates.

(d) *Foreign airplanes.* Pursuant to the definition of "aircraft" in 40 CFR 87.1(c), this FAR applies to civil airplanes that are powered by aircraft gas turbine engines of the classes specified herein and that have foreign airworthiness certificates that are equivalent to U.S. standard airworthiness certificates. This FAR applies only to those foreign civil airplanes that, if registered in the United States, would be required by applicable Federal Aviation Regulations to have a U.S. standard airworthiness certificate in order to conduct the operations intended for the airplane. Pursuant to 40 CFR 87.3(c), this FAR does not apply where it would be inconsistent with an obligation assumed by the United States

to a foreign country in a treaty, convention, or agreement.

(e) Reference in this regulation to 40 CFR part 87 refers to title 40 of the Code of Federal Regulations, chapter I—Environmental Protection Agency, part 87, Control of Air Pollution from Aircraft and Aircraft Engines (40 CFR part 87).

(f) This part contains regulations to ensure compliance with certain standards contained in 40 CFR part 87. If EPA takes any action, including the issuance of an exemption or issuance of a revised or alternate procedure, test method, or other regulation, the effect of which is to relax or delay the effective date of any provision of 40 CFR part 87 that is made applicable to an aircraft under this FAR, the Administrator of FAA will grant a general administrative waiver of its more stringent requirements until this FAR is amended to reflect the more relaxed requirements prescribed by EPA.

(g) Unless otherwise stated, all terminology and abbreviations in this FAR that are defined in 40 CFR part 87 have the meaning specified in that part, and all terms in 40 CFR part 87 that are not defined in that part but that are used in this FAR have the meaning given them in the Clean Air Act, as amended by Public Law 91-604.

(h) All interpretations of 40 CFR part 87 that are rendered by the EPA also apply to this FAR.

(i) If the EPA, under 40 CFR 87.3(a), approves or accepts any testing and sampling procedures or methods, analytical techniques, or related equipment not identical to those specified in that part, this FAR requires an applicant to show that such alternate, equivalent, or otherwise nonidentical procedures have been complied with, and that such alternate equipment was used to show compliance, unless the applicant elects to comply with those procedures, methods, techniques, and equipment specified in 40 CFR part 87.

(j) If the EPA, under 40 CFR 87.5, prescribes special test procedures for any aircraft or aircraft engine that is not susceptible to satisfactory testing by the procedures in 40 CFR part 87, the applicant must show the Administrator that those special test procedures have been complied with.

(k) Wherever 40 CFR part 87 requires agreement, acceptance, or approval by the Administrator of the EPA, this FAR requires a showing that such agreement or approval has been obtained.

(l) Pursuant to 42 U.S.C. 7573, no state or political subdivision thereof may adopt or attempt to enforce any standard respecting emissions of any air pollutant from any aircraft or engine

thereof unless that standard is identical to a standard made applicable to the aircraft by the terms of this FAR.

(m) If EPA, by regulation or exemption, relaxes a provision of 40 CFR part 87 that is implemented in this FAR, no state or political subdivision thereof may adopt or attempt to enforce the terms of this FAR that are superseded by the relaxed requirement.

(n) If any provision of this FAR is rendered inapplicable to a foreign aircraft as provided in 40 CFR 87.3(c) (international agreements), and § 34.3(d) of this FAR, that provision may not be adopted or enforced against that foreign aircraft by a state or political subdivision thereof.

(o) For exhaust emissions requirements of this FAR that apply beginning February 1, 1974, January 1, 1976, January 1, 1978, January 1, 1984, and August 9, 1985, continued compliance with those requirements is shown for engines for which the type design has been shown to meet those requirements, if the engine is maintained in accordance with applicable maintenance requirements for 14 CFR chapter I. All methods of demonstrating compliance and all model designations previously found acceptable to the Administrator shall be deemed to continue to be an acceptable demonstration of compliance with the specific standards for which they were approved.

(p) Each applicant must allow the Administrator to make, or witness, any test necessary to determine compliance with the applicable provisions of this FAR.

§ 34.4 [Reserved].

§ 34.5 Special test procedures.

The Administrator or the Administrator of the EPA may, upon written application by a manufacturer or operator of aircraft or aircraft engines, approve test procedures for any aircraft or aircraft engine that is not susceptible to satisfactory testing by the procedures set forth herein. Prior to taking action on any such application, the Administrator or the Administrator of the EPA shall consult with the other.

§ 34.6 Aircraft safety.

(a) The provisions of this part will be revised if at any time the Administrator determines that an emission standard cannot be met within the specified time without creating a safety hazard.

(b) Consistent with 40 CFR 87.6, if the FAA Administrator determines that any emission control regulation in this part cannot be safely applied to an aircraft, that provision may not be adopted or

enforced against that aircraft by any state or political subdivision thereof.

§ 34.7 Exemptions.

Notwithstanding part 11 of the Federal Aviation Regulations (14 CFR part 11), all petitions for rulemaking involving either the substance of an emission standard or test procedure prescribed by the EPA that is incorporated in this FAR, or the compliance date for such standard or procedure, must be submitted to the EPA. Information copies of such petitions are invited by the FAA. Petitions for rulemaking or exemption involving provisions of this FAR that do not affect the substance or the compliance date of an emission standard or test procedure that is prescribed by the EPA, and petitions for exemptions under the provisions for which the EPA has specifically granted exemption authority to the Secretary of Transportation are subject to part 11 of the Federal Aviation Regulations (14 CFR part 11). Petitions for rulemaking or exemptions involving these FARs must be submitted to the FAA.

(a) *Exemptions based on flights for short durations at infrequent intervals.* The emission standards of this part do not apply to engines which power aircraft operated in the United States for short durations at infrequent intervals. Such operations are limited to:

- (1) Flights of an aircraft for the purpose of export to a foreign country, including any flights essential to demonstrate the integrity of an aircraft prior to a flight to a point outside the United States.
- (2) Flights to a base where repairs, alterations or maintenance are to be performed, or to a point of storage, or for the purpose of returning an aircraft to service.
- (3) Official visits by representatives of foreign governments.
- (4) Other flights the Administrator determines, after consultation with the Administrator of the EPA, to be for short durations at infrequent intervals. A request for such a determination shall be made before the flight takes place.

(b) *Exemptions for very low production engine models.* The emission standards of this part do not apply to engines of very low production after the date of applicability. For the purpose of this part, "very low production" is limited to a maximum total production for United States civil aviation applications of no more than 200 units covered by the same type certificate after January 1, 1984. Engines manufactured under this provision must be reported to the FAA by serial number on or before the date of manufacture and exemptions granted under this

provision are not transferable to any other engine.

(c) *Exemptions for new engines in other categories.* The emissions standards of this part do not apply to engines for which the Administrator determines, with the concurrence of the Administrator of the EPA, that application of any standard under § 34.21 is not justified, based upon consideration of—

- (1) Adverse economic impact on the manufacturer;
- (2) Adverse economic impact on the aircraft and airline industries at large;
- (3) Equity in administering the standards among all economically competing parties;
- (4) Public health and welfare effects; and
- (5) Other factors which the Administrator, after consultation with the Administrator of the EPA, may deem relevant to the case in question.

(d) *Time-limited exemptions for in-use engines.* The emissions standards of this part do not apply to aircraft or aircraft engines for time periods which the Administrator determines, with the concurrence of the Administrator of the EPA, that any applicable standard under § 34.11(a), or § 34.31(a), should not be applied based upon consideration of—

- (1) Documentation demonstrating that all good faith efforts to achieve compliance with such standard have been made;
- (2) Documentation demonstrating that the inability to comply with such standard is due to circumstances beyond the control of the owner or operator of the aircraft; and
- (3) A plan in which the owner or operator of the aircraft shows that he will achieve compliance in the shortest time which is feasible.

(e) Applications for exemption from this part shall be submitted in duplicate to the Administrator in accordance with the procedures established by the Administrator in part 11.

(f) The Administrator shall publish in the Federal Register the name of the organization to whom exemptions are granted and the period of such exemptions.

(g) No state or political subdivision thereof may attempt to enforce a standard respecting emissions from an aircraft or engine if such aircraft or engine has been exempted from such standard under this part.

Subpart B—Engine Fuel Venting Emissions (New and In-Use Aircraft Gas Turbine Engines)

§ 34.10 Applicability.

(a) The provisions of this subpart are applicable to all new aircraft gas turbine engines of classes T3, T8, TSS, and TF equal to or greater than 36 kilonewtons (8090 pounds) rated output, manufactured on or after January 1, 1974, and to all in-use aircraft gas turbine engines of classes T3, T8, TSS, and TF equal to or greater than 36 kilonewtons (8090 pounds) rated output manufactured after February 1, 1974.

(b) The provisions of this subpart are also applicable to all new aircraft gas turbine engines of class TF less than 36 kilonewtons (8090 pounds) rated output and class TP manufactured on or after January 1, 1975, and to all in-use aircraft gas turbine engines of class TF less than 36 kilonewtons (8090 pounds) rated output and class TP manufactured after January 1, 1975.

§ 34.11 Standard for fuel venting emissions.

(a) No fuel venting emissions shall be discharged into the atmosphere from any new or in-use aircraft gas turbine engine subject to the subpart. This paragraph is directed at the elimination of intentional discharge to the atmosphere of fuel drained from fuel nozzle manifolds after engines are shut down and does not apply to normal fuel seepage from shaft seals, joints, and fittings.

(b) Conformity with the standard set forth in paragraph (a) of this section shall be determined by inspection of the method designed to eliminate these emissions.

(c) As applied to an airframe or an engine, any manufacturer or operator may show compliance with the fuel venting and emissions requirements of this section that were effective beginning February 1, 1974 or January 1, 1975, by any means that prevents the intentional discharge of fuel from fuel nozzle manifolds after the engines are shut down. Acceptable means of compliance include one of the following:

- (1) Incorporation of an FAA-approved system that recirculates the fuel back into the fuel system.
- (2) Capping or securing the pressurization and drain valve.
- (3) Manually draining the fuel from a holding tank into a container.

Subpart C—Exhaust Emissions (New Aircraft Gas Turbine Engines)**§ 34.20 Applicability.**

The provisions of this subpart are applicable to all aircraft gas turbine engines of the classes specified beginning on the dates specified in § 34.21.

§ 34.21 Standards for exhaust emissions.

(a) Exhaust emissions of smoke from each new aircraft gas turbine engine of class T8 manufactured on or after February 1, 1974, shall not exceed a smoke number (SN) of 30.

(b) Exhaust emissions of smoke from each new aircraft gas turbine engine of class TF and of rated output of 129 kilonewtons (29,000 pounds) thrust or greater, manufactured on or after January 1, 1976, shall not exceed $SN = 83.6(rO)^{-0.274}$ (rO is in kilonewtons).

(c) Exhaust emission of smoke from each new aircraft gas turbine engine of class T3 manufactured on or after January 1, 1978, shall not exceed a smoke number (SN) of 25.

(d) Gaseous exhaust emissions from each new commercial aircraft gas turbine engine that is manufactured on or after January 1, 1984, shall not exceed:

(1) Classes, TF, T3, T8 engines with rated output equal to or greater than 26.7 kilonewtons (6000 pounds)

Hydrocarbons: 19.6 grams/kilonewton rO.

(2) Class TSS

Hydrocarbons: $140(0.92)^{PR}$ grams/kilonewton rO.

(e) Smoke exhaust emissions from each gas turbine engine of the classes specified below shall not exceed:

(1) Class TF of rated output less than 26.7 kilonewtons (6000 pounds) manufactured on or after August 9, 1985 $SN = 83.6(rO)^{-0.274}$ (rO is in kilonewtons) not to exceed a maximum of SN=50.

(2) Classes T3, T8, TSS, and TF of rated output equal to or greater than 26.7 kilonewtons (6000 pounds) manufactured on or after January 1, 1984 $SN = 83.6(rO)^{-0.274}$ (rO is in kilonewtons) not to exceed a maximum of SN=50.

(3) Class TP of rated output equal to or greater than 1,000 kilowatts (1340 HP) manufactured on or after January 1, 1984 $SN = 187(rO)^{-0.168}$ (rO is in kilowatts).

(f) The standards set forth in paragraphs (a), (b), (c), (d), and (e) of this section refer to a composite gaseous emission sample representing the operating cycles set forth in the applicable sections of subpart G of this part, and exhaust smoke emissions

emitted during operations of the engine as specified in the applicable sections of subpart H of this part, measured and calculated in accordance with the procedures set forth in those subparts.

Subpart D—Exhaust Emissions (In-use Aircraft Gas Turbine Engines)**§ 34.30 Applicability.**

The provisions of this subpart are applicable to all in-use aircraft gas turbine engines certificated for operation within the United States of the classes specified, beginning on the dates specified in § 34.31.

§ 34.31 Standards for exhaust emissions.

(a) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of Class T8, beginning February 1, 1974, shall not exceed a smoke number (SN) of 30.

(b) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of Class TF and of rated output of 129 kilonewtons (29,000 pounds) thrust or greater, beginning January 1, 1976, shall not exceed $SN = 83.6(rO)^{-0.274}$ (rO is in kilonewtons).

(c) The standards set forth in paragraphs (a) and (b) of this section refer to exhaust smoke emissions emitted during operations of the engine as specified in the applicable section of subpart H of this part, and measured and calculated in accordance with the procedure set forth in this subpart.

Subpart E—[Reserved]**Subpart F—[Reserved]****Subpart G—Test Procedures for Engine Exhaust Gaseous Emissions (Aircraft and Aircraft Gas Turbine Engines)****§ 34.60 Introduction.**

(a) Except as provided under § 34.5, the procedures described in this subpart shall constitute the test program used to determine the conformity of new aircraft gas turbine engines with the applicable standards set forth in this part.

(b) The test consists of operating the engine at prescribed power settings on an engine dynamometer (for engines producing primarily shaft power) or thrust measuring test stand (for engines producing primarily thrust). The exhaust gases generated during engine operation must be sampled continuously for specific component analysis through the analytical train.

(c) The exhaust emission test is designed to measure hydrocarbons, carbon monoxide and carbon dioxide concentrations, and to determine mass

emissions through calculations during a simulated aircraft landing-takeoff (LTO) cycle. The LTO cycle is based on time in mode data during high activity periods at major airports. The test for non-TSS class propulsion engines consists of at least the following four modes of engine operations: taxi/idle, takeoff, climbout, and approach. The TSS class propulsion engine test requires an additional mode for descent. The mass emission for the modes are combined to yield the reported values.

(d) When an engine is tested for exhaust emissions on an engine dynamometer or test stand, the complete engine (with all accessories which might reasonably be expected to influence emissions to the atmosphere installed and functioning), shall be used if not otherwise prohibited by § 34.62(a)(2). Use of service air bleed and shaft power extraction to power auxiliary, gearbox-mounted components required to drive aircraft systems is not permitted.

(e) Other gaseous emissions measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator or the Administrator of the EPA.

§ 34.61 Turbine fuel specifications.

For exhaust emission testing, fuel meeting the specifications listed below shall be used. Additives used for the purpose of smoke suppression (such as organometallic compounds) shall not be present.

SPECIFICATION FOR FUEL TO BE USED IN AIRCRAFT TURBINE ENGINE EMISSION TESTING

Property values	Allowable range of
Specific Gravity at 15°C.....	0.78-0.82.
Distillation Temperature, °C.....	
10% Boiling Point.....	160-201.
Final Boiling Point.....	240-285.
Net Heat of Combustion, kJ/Kg.....	42,860-43,500.
Aromatics, Volume %.....	15-20.
Naphthalenes, Volume %.....	1.0-3.0.
Smoke Point, mm.....	20-28.
Hydrogen, Mass %.....	13.4-14.0.
Sulphur, Mass %.....	less than 0.3%.
Kinematic Viscosity at 20°C, mm ² /sec.....	4.0-6.5.

§ 34.62 Test procedure (propulsion engines).

(a)(1) The engine shall be tested in each of the following engine operating modes which simulate aircraft operation to determine its mass emission rates. The actual power setting, when corrected to standard day conditions, should correspond to the following

percentages of rated output. Analytical correction for variations from reference day conditions and minor variations in actual power setting should be specified and/or approved by the Administrator:

Mode	Class		
	TP	TF, T3, T8	TSS
Taxi/idle.....	(*)	(*)	(*)
Takeoff.....	100	100	100
Climbout.....	90	85	65
Descent.....	NA	NA	15
Approach.....	30	30	34

*See paragraph (a) of this section.

(2) The taxi/idle operating modes shall be carried out at a power setting of 7 percent rated thrust unless the Administrator determines that the unique characteristics of an engine model undergoing certification testing at 7 percent would result in substantially different HC emissions than if the engine model were tested at the manufacturers, recommended idle power setting. In such cases the Administrator shall specify an alternative test condition.

(3) The times in mode (TIM) shall be as specified below:

Mode	TP	TF, T3, or T8	TSS
Taxi/idle.....	26.0 Min.	26.0 Min.	26.0 Min.
Takeoff.....	0.5	0.7	1.2
Climbout.....	2.5	2.2	2.0
Descent.....	N/A	N/A	1.2
Approach.....	4.5	4.0	2.3

(b) Emissions testing shall be conducted on warmed-up engines which have achieved a steady operating temperature.

§ 34.63 [Reserved]

§ 34.64 Sampling and analytical procedures for measuring gaseous exhaust emissions.

The system and procedures for sampling and measurement of gaseous emissions shall be done in accordance with appendices 3 and 5 to ICAO Annex 16, Volume II—Aircraft Engine Emissions, First Edition, June 1981. This incorporation by reference was approved by the Director of the Federal

Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. This document can be obtained from the International Civil Aviation, P.O. Box 400, Succursale: Place de L'Aviation Internationale, 1000 Sherbrooke Street West, Montreal, Quebec, Canada H3H 2R2. Copies may be inspected at the FAA Office of the Chief Counsel, Rules Docket, room 916, Federal Aviation Administration Headquarters Building, 800 Independence Avenue SW., Washington, DC, or at the FAA New England Regional Office, 12 New England Executive Park, Burlington, Massachusetts, or at the Office of the Federal Register, 1100 L Street NW., room 8401, Washington, DC.

§ 34.65-34.70 [Reserved]

§ 34.71 Compliance with gaseous emission standards.

Compliance with each gaseous emission standard by an aircraft engine shall be determined by comparing the pollutant level in grams/kilowatt/thrust/cycle or grams/kilowatt/cycle as calculated pursuant to § 34.64 with the applicable emission standard under this part.

Subpart H—Test Procedures for Engine Smoke Emissions (Aircraft Gas Turbine Engines)

§ 34.80 Introduction.

Except as provided under § 34.5, the procedures described in this subpart shall constitute the test program to be used to determine the conformity of new and in-use gas turbine engines with the applicable standards set forth in this part. The test is essentially the same as that described in §§ 34.60-34.62, except that the test is designed to determine the smoke emission level at various operating points representative of engine usage in aircraft. Other smoke measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator or the Administrator of the EPA.

§ 34.81 Fuel specifications.

Fuel having specifications as provided in § 34.61 shall be used in smoke emission testing.

§ 34.82 Sampling and analytical procedures for measuring smoke exhaust emissions.

The system and procedures for sampling and measurement of smoke emissions shall be done in accordance with appendix 2 to ICAO Annex 16, Volume II—Aircraft Engine Emissions, First Edition, June 1981. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. This document can be obtained from the International Civil Aviation, P.O. Box 400, Succursale: Place de L'Aviation Internationale, 1000 Sherbrooke Street West, Montreal, Quebec, Canada H3H 2R2. Copies may be inspected at the FAA Office of the Chief Counsel, Rules Docket, room 916, Federal Aviation Administration Headquarters Building, 800 Independence Avenue SW., Washington, DC, or at the FAA New England Regional Office, 12 New England Executive Park, Burlington, Massachusetts, or at the Office of the Federal Register, 1100 L Street NW., room 8401, Washington, DC.

§ 34.83-§ 34.88 [Reserved]

§ 34.89 Compliance with smoke emission standards.

Compliance with each smoke emission standard shall be determined by comparing the plot of the smoke number as a function of power setting with the applicable emission standard under this part. The smoke number at every power setting must be such that there is a high degree of confidence that the standard will not be exceeded by any engine of the model being tested. An acceptable alternative to testing every engine is described in appendix 6 to ICAO Annex 16, Volume II—Aircraft Engine Emissions, First Edition, June 1981. Other methods of demonstrating compliance may be approved by the Administrator with the concurrence of the Administrator of the EPA.

Issued in Washington, DC, on July 26, 1990.

James B. Busey,

Administrator.

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