[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 34 and 45

[Docket No.: FAA-2012-1333; Amendment Nos. 34-5 and 45-28]

RIN 2120-AK15

Exhaust Emissions Standards for New Aircraft Gas Turbine Engines and Identification Plate for Aircraft Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: This action amends the emission standards for turbine engine powered airplanes to incorporate the standards promulgated by the United States Environmental Protection Agency (EPA) on June 18, 2012. This amendment fulfills the FAA's requirements under the Clean Air Act Amendments of 1970 to issue regulations ensuring compliance with the EPA standards. This action revises the standards for oxides of nitrogen and test procedures for exhaust emissions based on International Civil Aviation Organization standards, and for the identification and marking requirements for engines.

DATES: Effective December 31, 2012.

Affected parties, however, are not required to comply with the information collection requirement in § 45.11 until the Office of Management and Budget (OMB) approves the collection and assigns a control number under the Paperwork Reduction Act of 1995. The FAA will publish in the Federal Register a notice of the control number assigned by the Office of Management and Budget (OMB) for this information collection requirement.

The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of December 31, 2012.

Submit comments on or before March 1, 2013.

ADDRESSES: You may send comments identified by Docket Number FAA-2012-1333 using any of the following methods:

- *Federal eRulemaking Portal*: Go to www.regulations.gov and follow the instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, West Building Ground Floor, Room W12-140, Washington, DC 20590.
- *Fax:* Fax comments to Docket Operations at 202-493-2251.
- *Hand Delivery:* Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holiday.

FOR FURTHER INFORMATION CONTACT: For technical questions concerning this action, contact Aimee Fisher, Emissions Division (AEE-300), Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591; telephone (202) 267-7705; e-mail Aimee.Fisher@faa.gov.

For legal questions concerning this rule contact Karen Petronis, International Law, Legislation and Regulations Division (AGC-200), Office of the Chief Counsel, Federal Aviation

Administration, 800 Independence Avenue, SW, Washington, DC 20591; telephone (202) 267-3073, e-mail Karen.Petronis@faa.gov.

SUPPLEMENTARY INFORMATION

Good Cause for Immediate Adoption

Section 553(b)(3)(B) of the Administrative Procedure Act (APA) (5 U.S.C. 551 et seq.) authorizes agencies to dispense with notice and comment procedures for rules when the agency for "good cause" finds that those procedures are "impracticable, unnecessary, or contrary to the public interest." Under this section, an agency, upon finding good cause, may issue a final rule without seeking comment prior to the rulemaking.

In July 2011, the United States Environmental Protection Agency (EPA) proposed new aircraft engine emission standards for oxides of nitrogen (NOx), compliance flexibilities, and other regulatory requirements applicable to aircraft turbofan or turbojet engines with rated thrusts greater than 26.7 kilonewtons (kN) (76 FR 45012, July 27, 2011). The final rule adopting these proposals was published in the Federal Register on June 18, 2012 (77 FR 36342). The public had an opportunity to comment on the EPA's proposed rule, and the comments received were addressed in the EPA's final rule.

Section 232 of the Clean Air Act Amendments of 1970 (CAA) (42 USC 7572) directs the FAA to prescribe regulations to ensure compliance with the EPA's aircraft emission standards. The FAA is amending 14 CFR parts 34 and 45 to incorporate the changes promulgated by the EPA in the emission standards and the associated engine marking requirements. The FAA is not adopting any standards or requirements different from those promulgated by the EPA. Accordingly, the FAA finds that further public comment on these standards prior to

promulgation is unnecessary, and that further delay in making the regulations consistent would be contrary to the public interest.

Section 553(d)(3) of the Administrative Procedure Act requires that agencies publish a rule not less than 30 days before its effective date, except as otherwise provided by the agency for good cause found and published with the rule.

This rule, as previously adopted by the EPA, contains a production cutoff date of December 31, 2012. In addition, it contains a new production marking requirement that is effective on aircraft engines produced after December 31. In order to give manufacturers the maximum amount of time to adjust their processes to these requirements, the FAA finds that good cause exists to make this rule effective in less than 30 days.

Authority for this Rulemaking

The FAA's authority to issue rules on aviation safety is found in Title 49 of the United States Code. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency's authority. This rulemaking is promulgated under the authority described in Subtitle VII, Part A, Subpart III. Under Section 232 of the CAA (42 USC 7571), the FAA is directed to prescribe regulations to ensure compliance with the standards prescribed by the EPA under § 7571, including making such standards applicable in the issuance, amendment, modification, suspension, or revocation of any certificate authorized by part A of subtitle VII of title 49. These regulations are within the scope of that authority, as the FAA is adopting the standards promulgated by the EPA and making them applicable to aircraft engine type certificates issued under the FAA's Title 49 authority.

Comments Invited

For the reasons noted above, the FAA is adopting this final rule without prior notice and public comment. The Regulatory Policies and Procedures of the Department of Transportation (DOT) (44 FR 1134; February 26, 1979) provide that, to the maximum extent possible, operating administrations for the DOT should provide an opportunity for public comment on regulations issued without prior notice.

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. The agency also invites comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the changes. The most helpful comments reference a specific portion of this rule, explain the reason for any recommended change, and include supporting data. To ensure the docket does not contain duplicate comments, please send only one copy of written comments, or if you are filing comments electronically, please submit your comments only one time.

The FAA will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel concerning this rulemaking. Once the comment period closes, the FAA will review and dispose of the comments filed in the rulemaking docket. Because this is a final rule, the FAA will publish a disposition of comments in the Federal Register. Based on the comments received, the FAA will state whether it has decided that (i) no action is necessary other than publishing the disposition of comments in the Federal Register, or (ii) the FAA should prepare a revised final rule.

Privacy: We will post all comments we receive, without change to www.regulations.gov, including any personal information you provide. Using the search function of our docket website, anyone can find and read the comments received into any of our dockets, including the name of the individual sending the comment (or signing the comment for an association,

business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the *Federal Register* published on April 11, 2000 (65 FR 19477-78) or you may visit DocketsInfo.dot.gov.

Docket: To read background documents or comments received, go to *regulations.gov* at any time or to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Proprietary or Confidential Business Information

Do not file in the docket information that you consider to be proprietary or confidential business information. Send or deliver this information directly to the person identified in the FOR FURTHER INFORMATION CONTACT section of this document. Mark the information that is considered proprietary or confidential. If the information is on a disk or CD ROM, mark the outside of the disk or CD ROM and also identify electronically within the disk or CD ROM the specific information that is proprietary or confidential.

Under § 11.35(b), when the FAA is aware of proprietary information filed with a comment, the agency does not place it in the docket. The FAA holds it in a separate file to which the public does not have access, and the agency places a note in the docket that it has received it. If the FAA receives a request to examine or copy this information, the FAA treats it as any other request under the Freedom of Information Act, 5 U.S.C. 552. The FAA processes such a request under the DOT procedures found in 49 CFR part 7.

Availability of Rulemaking Documents

You can get an electronic copy of rulemaking documents using the Internet by:

(1) Searching the Federal eRulemaking portal at http://www.regulations.gov;

(2) Visiting the FAA's Regulations and Policies web page at http://www.faa.gov/regulations_policies/; or

(3) Accessing the Government Printing Office's web page at http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=FR.

You can also get a copy by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue S.W., Washington, DC 20591, or by calling (202) 267-9680. Make sure to identify the docket and amendment numbers of this rulemaking.

I. Background

Section 231(a)(2)(A) of the CAA (42 USC 7571) directs the Administrator of the EPA to propose aircraft emission standards applicable to the emission of any air pollutant from classes of aircraft engines which in the EPA Administrator's judgment causes or contributes to air pollution that may reasonably be anticipated to endanger public health or welfare. These emission standards have been promulgated by the EPA in 40 CFR part 87.

Section 232 of the CAA (42 USC 7572) then directs the FAA to prescribe regulations to ensure compliance with the EPA's standards. The FAA has promulgated these emission standards in 14 CFR part 34, and the engine marking requirements in part 45.

The EPA initially regulated gaseous exhaust emissions, smoke and fuel venting from aircraft in 1973, with occasional revision. Since the EPA's adoption of the initial regulations, the FAA has taken subsequent action to ensure that the regulations in 14 CFR are kept current with the EPA's standards. This final rule continues the revisions to the regulations in 14 CFR.

On July 27, 2011, the EPA proposed new aircraft engine emission standards for NOx, compliance flexibilities, and other regulatory requirements for aircraft turbofan or turbojet

engines with rated thrusts greater than 26.7 kilonewtons (kN) (76 FR 45012). The EPA also proposed adopting the gas turbine engine test procedures of ICAO. The final rule adopting these proposals was published on June 18, 2012 (77 FR 36342), and was effective July 18, 2012.

II. Summary of the Costs and Benefits of the Final Rule

Department of Transportation Order DOT 2100.5 prescribes policies and procedures for simplification, analysis, and review of regulations. If the expected cost impact is so minimal that a proposed or final rule does not warrant a full evaluation, this order permits that a statement to that effect and the basis for it to be included in the preamble if a full regulatory evaluation of the cost and benefits is not prepared. Such a determination has been made for this final rule.

III. Discussion of This Final Rule

1. New Naming Convention

The EPA has adopted a new naming convention, "tier," in 40 CFR part 87. The tier numbers distinguish levels of increased stringency in the NOx emission standards. This convention is consistent with the numeric identifier that the Committee on Aviation Environmental Protection (CAEP) of ICAO uses to differentiate the CAEP work cycles that produce new standards. For example, the standards that correspond to CAEP's sixth meeting (CAEP/6) are identified by the EPA as Tier 6, while the standards that correspond to CAEP/8 are called Tier 8. The naming convention is also being applied to previously effective less stringent standards, i.e., Tier 0, Tier 2, and Tier 4. None of the previous standards have been changed, only the tier designation has been added in the regulations for comparison and consistency. The following table identifies the various CAEP cycles and corresponding tier naming convention.

The tier designation departs from the previous FAA practice that described aircraft engine emission standards as amendments. The new designation is a valuable tool that provides

a consistent reference to individual standards. The FAA is adopting this naming convention in the emission standards contained in this final rule; the designations appear in §§ 34.21 and 34.23.

Table 1 – Naming Conventions Comparison

CAEP Meeting # and Annex 16 Amendment	Date CAEP Adopted, Effective, & Applicable	FAA Part 34 Amendments	14 CFR Part 34 Rule Promulgation	40 CFR Part 87 Tier
CAEP/1 Annex 16 Vol II, Amendment 1	03/4/1988 07/31/1998 11/17/1988	1. NPRM cancel SFAR 27 and add FAR 34-1; 2. 14 CFR Part 34 Amendment 2	1. 08/10/1990 2. 09/10/1990	Tier 0
CAEP/2 Annex 16 Vol II, Amendment 2	03/24/1993 07/26/1993 11/11/1993	14 CFR Part 34 Amendment 3	3/3/1999	Tier 2
CAEP/4 Annex 16 Vol II, Amendment 4	02/26/1999 07/19/1999 11/4/1999	14 CFR Part 34 Amendment 4	4/29/2009	Tier 4
CAEP/6 Annex 16 Vol II, Amendment 5	02/23/2005 07/11/2005 11/24/2005	14 CFR Part 34 Amendment 5	TBD (40 CFR Part 87 Effective July 18, 2012)	Tier 6
CAEP/8 Annex 16 Vol II, Amendment 7	03/4/2011 07/18/2011 11/17/2011			Tier 8

Note: The NOx standards were not amended during CAEP/3, CAEP/5, and CAEP/7 meetings and are not included in the tier designations.

2. Changes to Part 34

This final rule adopts the same emissions standards in part 34 as the EPA promulgated for 40 CFR part 87. Any differences between the appearance of the regulations is the result of different regulatory formats between the two titles. No difference in the standards or the meaning of any term is implied nor should any difference be presumed. In the event that a substantive difference is identified, the regulation in 40 CFR part 87 is considered controlling and will be enforced.

The FAA is not changing any of its procedures for exemption requests submitted under part 34. The FAA intends to continue to work together with the EPA to jointly consider all exemption requests as we have in the past.

In this document we are revising paragraph 34.7(b) to add an additional sentence limiting the applicability to the requirements of § 34.21 (maintaining the current scope after § 34.23 is added).

3. NOx Standards for Newly Certificated Engines

Table 2 below summarizes the NOx standards for newly certificated engines that are adopted in this final rule, in § 34.23. The regulation establishes two levels of increasingly stringent NOx emission standards for gas turbofan engines with maximum rated thrusts greater than 26.7 kN. The standard applicable to a particular engine is based on its type certification date. Newly certificated aircraft engines are those that receive a new type certificate after the effective date of the applicable standard. The two new standards are:

a. Tier 6/CAEP 6 NOx Standards

The first set of standards is equivalent to the NOx limits established at the CAEP/6 meeting. This level was originally adopted by ICAO and became internationally applicable after December 31, 2007. Engine manufacturers have been producing engines that meet Tier 6 standards even though the standard and the marking designation had not yet been adopted in the United States.

Overall, Tier 6 represents an approximate 12 percent reduction in NOx emissions from Tier 4, § 34.21(d)(1)(vi). Tier 4 standards were adopted by ICAO in 2005 with an implementation date in 2008. The Tier 6 standard is incorporated in § 34.23(a).

Under the EPA rule, the Tier 6 standard was effective for engines produced on and after July 18, 2012, unless otherwise covered by an exception or exemption. These exceptions include:

1. The production of Tier 4 engines introduced before July 18, 2012, (including their derivatives) through December 31, 2012 (§ 34.23(c) and 40 CFR § 87.23(d)(1)); and

2. Up to six engines per manufacturer produced on and after July 18, 2012 and before August 31, 2013 (§ 34.9(b) and 40 CFR § 87.23(d)(3)). This exception is described more fully in section 4 below.

Exemptions to the standards of part 34 must be filed under the regulatory exemption process discussed in § 34.7 and part 11.

b. Tier 8/CAEP 8 NOx Standards

The second set of new standards is equivalent to the CAEP/8 NOx limits that were recommended at the February 2010 CAEP/8 meeting and applicable as ICAO standards and recommended practices in November 2011. These Tier 8 standards will be mandatory in the United States for engines for which the first individual production model is manufactured after December 31, 2013. Overall, Tier 8 represents an approximate 15 percent reduction in NOx emissions from Tier 6. The Tier 8 standard is incorporated in § 34.23(b).

Table 2 - Tier 6 and Tier 8 Standards for NOx

Tier	Date	Class	Rated pressure ratio - rPR	Rated output rO (kN)	NOx (g/kN)
Tier 6	Manufactured on and after July 18, 2012 and for which the first individual production model is manufactured on or before December 31, 2013 (subject to regulatory exceptions).	TF, T3, T8	rPR ≤ 30	26.7 < rO < 89.0	38.5486 + 1.6823 (rPR) − 0.2453 (rO) − (0.00308 (rPR) (rO))
				rO > 89.0	16.72 + 1.4080 (rPR)
			30 < rPR < 82.6	26.7 < rO ≤ 89.0	46.1600 + 1.4286 (rPR) − 0.5303 (rO) + (0.00642 (rPR) (rO))
				rO > 89.0	–1.04 + 2.0 (rPR)
			rPR ≥ 82.6	All	32 + 1.6 (rPR)
Tier 8	First individual production model manufactured after December 31, 2013.	TF, T3, T8	rPR ≤ 30	26.7 < rO < 89.0	40.052 + 1.5681 (rPR) − 0.3615 (rO) − (0.0018 (rPR) (rO))
				rO > 89.0	7.88 + 1.4080 (rPR)
			30 < rPR < 104.7	26.7 < rO < 89.0	41.9435 + 1.505 (rPR) − 0.5823 (rO) + (0.005562 (rPR) (rO))
				rO > 89.0	–9.88 + 2.0 (rPR)
			rPR ≥ 104.7	All	32 + 1.6 (rPR)

4. Standards for Engines Manufactured On and After July 18, 2012

This final rule applies to engines that are to be manufactured on and after July 18, 2012, the effective date for Tier 6 standards in the United States. However, Tier 4 engines introduced before July 18, 2012 (and their derivatives) may continue to be produced through December 31, 2012 without further action by the manufacturer. In addition, § 34.9(b) incorporates an exception that allows each engine manufacturer to produce up to six Tier 4 compliant engines with a date of manufacture on and after July 18, 2012 and before August 31, 2013 that do not meet the Tier 6 standards without further action by the manufacturer. Engines produced under this exception are required to meet Tier 4 standards.

The primary purpose of allowing limited continued production of Tier 4 engines is to provide for an orderly transition to Tier 6 standards as Tier 4 engines reach the end of their production cycles.

5. Spare Engines

This final rule allows for the production of a "spare" engine that is newly produced but meets the Tier 4 emission standard under which it was certificated rather than a more stringent standard that may be in place at the time of production. A spare engine may be produced as a replacement for an engine in service, whether installed temporarily during a repair or for permanent use. A spare engine may not be installed on a new aircraft. A spare engine may have different emission levels for individual pollutants than the engine being replaced, as long as the spare remains in overall compliance with the levels required for the original engine's type certificate.

The standard is incorporated in § 34.9(a). Spare engines must be marked in accordance with § 45.13(a)(7)(v).

6. Standards for Supersonic Aircraft Turbine Engines

This final rule contains carbon monoxide (CO) and NOx emission standards for turbine engines that are used to propel aircraft at sustained supersonic speeds (i.e., supersonic aircraft). While emission standards for these aircraft were originally adopted by ICAO in the 1980s, the original U.S. adoption of emission standards for supersonic aircraft did not include CO or NOx. The absence of U.S. standards for these pollutants has no practical effect because supersonic aircraft are not allowed to fly over the continental U.S. and no supersonic engines have been certificated since the Olympus 593 Mk. 610-14-28 installed on the Concorde. This certification has since been surrendered and the engines are no longer in production. We are adopting CO

and NOx standards that will apply to future engine designs used on supersonic aircraft and for harmonization with ICAO standards.

Table 3 – Gaseous Emission Standards for Supersonic Engines

Class	Rated output rO[1] (kN)	NOx (g/kN)	CO (g/kN)
TSS	All	36 + 2.42 (rPR)	4,550 $(rPR)^{-1.03}$

[1] rO is the rated output with afterburning applied;

7. Test Procedures

The amended test procedures adopted in § 34.60 are based on ICAO Annex 16, Volume II. The amendments to Annex 16 Volume II include clarifications and add flexibilities for engine manufacturers. They are:

- Standardizing the terminology relating to engine thrust/power.
- Clarifying the need to correct measured results to standard reference day and reference engine conditions.
- Allowing a certificating authority to approve the use of test fuels other than those specified during certification testing.
- Allowing materials other than stainless steel in the sample collection equipment.
- Clarifying the appropriate value of fuel flow to be used at each LTO test point.
- Clarifying exhaust nozzle terminology for exhaust emissions sampling.
- Allowing an equivalent procedure for gaseous emission and smoke measurement if approved by the certificating authority.

Many manufacturers are already voluntarily complying with these changes. The U.S. adoption of these test procedure amendments is unlikely to require new action by manufacturers. To accomplish the above changes, we have revised § 34.60 and removed §§ 34.61 through 34.64,

and 34.71. This action eliminates subpart H of part 34, and we have removed cross references to subpart H in the affected sections where they appear.

8. Definitions

In promulgating the new standards, the EPA adopted several new definitions for terms in its regulations. The FAA is including seven of these definitions in § 34.1 to avoid any uncertainty about their meaning and application. These definitions are consistent with CAEP/8 usage, and the common understanding of these terms as used by industry. The terms and definitions have the same scope and meaning as they have in 40 CFR part 87. Since the regulation includes the terms and their definitions, they are not being repeated here.

9. Derivative Engines

Often manufacturers will make changes to a type certificated engine that is in production while keeping the same basic engine core and combustor design. In some cases, these modifications may affect emissions. We are adopting the term "derivative engine for emissions certification purposes" to distinguish an engine model for which the emission characteristics vary from the original type certificated engine design, but remain within the criteria specified in § 34.48.

The FAA has adopted the EPA's rule text in § 34.48 that uses the phrase "similar in design to a previously certificated (original) engine for purposes of compliance" with the emissions standards. The FAA understands the "original" to be a previously type certificated engine for which there is test data. That test data will be used in determining whether the new engine may be considered a derivative using the criteria in § 34.48.

To qualify as a derivative engine for emissions certification purposes, an engine must comply with the emission standards associated with the original type certificated engine. The

derivative engine must have the same or similar emission characteristics as the original type certificated engine; the original engine must be listed on a U.S. type certificate issued under part 33. The FAA will make the following determinations regarding derivatives:

- Whether the emission characteristics of the modified design are significantly different from the original type certificated engine's emissions such that a demonstration of compliance with more recent emission standards is necessary;
- Whether the changes are minor relative to the original type certificated engine's emissions, such that it may be considered a derivative version of the original type certificated engine model with no emissions changes;
- Whether iterative changes made over time resulted in a cumulative change that reaches the point at which a new demonstration of compliance is warranted.

In the past, these determinations were made for turbofan engines by an engineering evaluation that was performed by the engine manufacturer and then reviewed by the FAA. The definition of "derivative engines for emissions certification purposes," along with the criteria for making this determination, will provide engine manufacturers and the FAA with more certainty regarding emission standard requirements for future modifications made to certificated models. The FAA will continue its existing practices for determining derivatives for part 33 engine certification, expanding those practices to make "derivative engines for emissions certification" determinations under the criteria promulgated by the EPA and adopted here into § 34.48.

If a derivative engine is sufficiently similar to its original type certificated engine so as to meet the criteria established in § 34.48, the manufacturer may demonstrate certification compliance and continue production of the engine model to the same extent as allowed for the original engine model. However, if a derivative engine is determined to be significantly different

than the original type certificated engine, the manufacturer would be required to demonstrate compliance with the most recent emission standards. This determination will be made using numerical criteria consistent with ICAO provisions. An engine model may be considered a derivative only if:

1. It is a modification of an engine that received a U.S. type certificate;
2. The engine was certificated under 14 CFR part 33; and
3. One of the following conditions is met:

- If the FAA determines that a safety issue exists that requires an engine modification; or
- If emissions from the derivative engines are equivalent to or lower than the original type certificated engine.

This final rule provides that an engine manufacturer may show emissions equivalency by demonstrating that the difference between emission rates of a derivative engine and the original type certificated engine are within the following allowable ranges (unless otherwise adjusted using good engineering judgment as determined by the FAA):

- ± 3.0 g/kN for NOx,
- ± 1.0 g/kN for HC,
- ± 5.0 g/kN for CO, and
- ± 2.0 SN for smoke.

This final rule also provides that an engine model whose characteristic level is at least 5 percent below all applicable standards would be allowed to demonstrate equivalency by engineering analysis. In all other cases, the manufacturer is required to test the new engine model to show emission equivalency.

10. Abbreviations

Similar to the new terms being defined in § 34.1, certain abbreviations have been added or corrected in § 34.2. No separate discussion of them is included here. We are amending the text of §§ 34.10(a) and (b), 34.21(b) and (d), and 34.31(b) to include the correct notation of these abbreviations.

11. Miscellaneous

In § 34.21(b) of the current regulation, there is a printing error. The formula for smoke number should have included "-0.274" as a superscript notation. Instead, it was printed in regular size text, implying a very different mathematical calculation. Since all other instances of the notation in paragraphs (d) and (e) of that section are correct, we are not aware that there has been any misunderstanding from this printing error, but we are correcting it here.

The FAA is revising §§ 34.3(c) and (d), General requirements, to eliminate the use of the term Federal Aviation Regulation and its abbreviation, FAR. Neither term is correct. As regulations are amended, the FAA is removing these terms.

In addition, the FAA is revising § 34.3(d) to remove the reference to 40 CFR 87.1(c) and replacing it with a reference to 40 CFR 87.1 as the EPA regulation no longer uses subparagraph designations in that section,

12. Part 45 – Identification Data

The new emission standards require the addition of new designations to identify the status of engines at manufacture. Section 45.13(a)(7) is being added to include the new designations EXEMPT NEW and EXCEPTED SPARE. Engines are already required to carry certain production markings, and this amendment merely adds the two new designations adopted in this final rule. The use of these new terms is required under §§ 34.7(h) and 34.9(a)(6).

IV. Regulatory Notices and Analyses

A. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. According to the 1995 amendments to the Paperwork Reduction Act (5 CFR 1320.8(b)(2)(vi)), an agency may not collect or sponsor the collection of information, nor may it impose an information collection requirement unless it displays a currently valid Office of Management and Budget (OMB) control number.

This action contains an existing collection in use without an OMB control number. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has submitted these information collection amendments to OMB for its review.

Summary: Under § 45.11, manufacturers of engines are required to mark each engine produced under a type certificate or production certificate by attaching a fireproof identification plate that contains the information specified in § 45.13. As part of the information required, § 45.13(a)(7) states that one of three designations (comply, exempt and non US) that indicates compliance with the applicable exhaust emission provisions of part 34 and 40 CFR part 87 must be included. Under this final rule, the number of possible designations is being increased to five (comply, exempt, non US, excepted spare and exempt new), with the new designations having been adopted from the determinations made at ICAO CAEP/8.

Use: The information will be used by purchasers, owners, operators and FAA inspectors, periodically, to confirm that an engine meets the exhaust emission provisions of part 34 and 40 CFR part 87.

Respondents (including number of): There are currently 10 engine manufacturers that will be impacted by this requirement.

Frequency: This is a one time burden for each engine. The information required will be stamped on the identification plate at the time of manufacture.

Annual Burden Estimate: We estimate that approximately 1,200 engines will be manufactured each year by 10 engine manufacturers and that stamping each identification plate will require 5 minutes. The annual burden is estimated to be 100 hours. We estimate that it will take 5 minutes to label each engine for an average cost of $3.75 for labor and materials for each engine. The total annual cost to respondents is estimated to be $4,500.

The agency is soliciting comments to—

(1) Evaluate whether the proposed information requirement is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility;

(2) Evaluate the accuracy of the agency's estimate of the burden;

(3) Enhance the quality, utility, and clarity of the information to be collected; and

(4) Minimize the burden of collecting information on those who are to respond, including by using appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology.

Individuals and organizations may send comments on the information collection requirement to the address listed in the ADDRESSES section at the beginning of this preamble by March 1, 2013. Comments also should be submitted to the Office of Management and Budget, Office of

Information and Regulatory Affairs, Attention: Desk Officer for FAA, New Executive Building, Room 10202, 725 17th Street, NW., Washington, DC 20503.

B. Regulatory Evaluation

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 and Executive Order 13563 direct that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Public Law 96-354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Public Law 96-39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, the Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Public Law 104-4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble summarizes the FAA's analysis of the economic impacts of this final rule.

Department of Transportation Order DOT 2100.5 prescribes policies and procedures for simplification, analysis, and review of regulations. If the expected cost impact is so minimal that a proposed or final rule does not warrant a full evaluation, this order permits that a statement to that effect and the basis for it to be included in the preamble if a full regulatory evaluation of the

cost and benefits is not prepared. Such a determination has been made for this final rule. The reasoning for this determination follows:

Rulemaking actions by the FAA usually trigger a full regulatory evaluation of the potential monetary costs that would be imposed and benefits generated (including separate analyses for regulatory flexibility, international trade impact, and unfunded mandates). However, this regulation brings the regulations in 14 CFR into conformity with the existing EPA regulations. A full regulatory evaluation is unwarranted because the FAA is not imposing any new standards on the aviation industry for engine emissions or test procedures. The EPA concluded (77 FR 36342, 36386, June 18, 2012) that its rule would impose minimal costs to manufacturers because the affected engines are designed for and marketed internationally, and thus are already being manufactured using the ICAO standards adopted in this rule.

The FAA has made one addition to the standards adopted by the EPA. Previously, each affected engine had to be marked pursuant to 14 CFR part 45 as falling under one of three engine categories. The rule now requires that each affected engine has to be marked as falling under one of five engine categories. As all affected engines had to be marked under the previous rule, increasing the number of categories from three to five will not change the number of engines that need to be marked. The EPA rule required these markings be effective, but the requirement that controls engine marking exists only in 14 CFR part 45. Accordingly, the FAA is simply implementing the EPA requirement. The FAA has, therefore, determined that this final rule is not a "significant regulatory action" as defined in section 3(f) of Executive Order 12866, and is not "significant" as defined in DOT's Regulatory Policies and Procedures.

C. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (Public Law 96-354) (RFA) establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the businesses, organizations, and governmental jurisdictions subject to regulation." To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration." The RFA covers a wide-range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a rule will have a significant economic impact on a substantial number of small entities. If the agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA.

However, if an agency determines that a rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

This final rule revises the emission standards for turbine engine airplanes, the test procedures for gaseous emissions, and the different engine categories for marking purposes. Other than the FAA marking requirement that involves minimal cost changes to engine manufacturers, all of the costs associated with this rule have been addressed by the EPA in its rulemaking. The EPA determined that its rule would impose minimal costs to manufacturers because the affected engines are designed for and marketed internationally, and thus are already

being manufactured using the ICAO standards adopted in the EPA rule. Thus, this rule has a minimal economic impact.

Therefore, as the FAA Acting Administrator, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

D. International Trade Impact Assessment

The Trade Agreements Act of 1979 (Public Law 96-39), as amended by the Uruguay Round Agreements Act (Public Law 103-465), prohibits Federal agencies from establishing standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such as the protection of safety, and does not operate in a manner that excludes imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA has assessed the potential effect of this final rule and determined that it is in accord with the Trade Agreements Act, as the rule uses the ICAO international standards as the basis for the U.S. regulation.

E. Unfunded Mandates Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (Public Law 104-4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of $100 million or more (in 1995 dollars) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a "significant regulatory action." The FAA currently uses an inflation-adjusted value of $143.1 million in lieu of $100 million. This final

rule does not contain such a mandate; therefore, the requirements of Title II of the Act do not apply.

F. International Compatibility and Cooperation

(1) In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to conform to International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified no differences with these regulations.

(2) Executive Order 13609, Promoting International Regulatory Cooperation, promotes international regulatory cooperation to meet shared challenges involving health, safety, labor, security, environmental, and other issues and to reduce, eliminate, or prevent unnecessary differences in regulatory requirements. The FAA has analyzed this action under the policies and agency responsibilities of Executive Order 13609, and has determined that this action would have no effect on international regulatory cooperation.

G. Environmental Analysis

In accordance with FAA Order 1050.1E, the FAA has determined that this action is categorically excluded from environmental review under section 103(2)(c) of the National Environmental Policy Act (NEPA). This action is categorically excluded under FAA Order 1050.1E, Chapter 3, paragraph 312a, which covers "all FAA actions to ensure compliance with EPA aircraft emission standards." This rule amends the emission standards for turbine engine powered airplanes and certain marking requirements for engines, to incorporate the standards adopted by EPA based on the ICAO standards for gaseous emissions of NOx.

Executive Order Determinations

Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. We determined that this action will not have a substantial direct effect on the States, or the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, we determined that this final rule does not have federalism implications.

Executive Order 13211, Regulations that Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use, 66 FR 28355 (May 18, 2001). We have determined that it is not a "significant energy action" under the executive order because it is not a "significant regulatory action" under Executive Order 12866, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

List of Subjects

14 CFR Part 34

Air pollution control, Aircraft, Incorporation by reference.

14 CFR Part 45

Aircraft, marking, identification data.

The Amendments

In consideration of the foregoing, the Federal Aviation Administration amends Chapter I of Title 14 Code of Federal Regulations as follows:

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

1. The authority citation for part 34 is revised to read as follows:

Authority: 42 U.S.C 4321 *et seq.,* 7572l 49 U.S.C. 106(g), 40113, 44701-44702, 44704, 44714

Subpart A – [Amended]

2. In § 34.1, add in alphabetical order, the definitions for the terms "Characteristic level", "Derivative engine for emissions certification purposes", "Excepted", "Exempt", "Introduction date", and "Tier", and revise the definitions of "Commercial aircraft engine", "Rated output (rO)," and "Rated pressure ratio (rPR)" to read as follows:

§ 34.1 Definitions.

* * * * *

Characteristic level has the meaning given in Appendix 6 of ICAO Annex 16 as of July 2008. The characteristic level is a calculated emission level for each pollutant based on a statistical assessment of measured emissions from multiple tests.[1]

[1] 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 ICAO, Document Sales Unit, 999 University Street, Montreal, Quebec H3C 5H7, Canada, phone +1 514–954–8022, or www.icao.int or sales@icao.int. Copies can be reviewed at the FAA New England Regional Office, 12 New England Executive Park, Burlington, Massachusetts, 781–238–7101, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

* * * * *

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 Title 49 of the United States Code and Title 14 of the Code of Federal Regulations.

* * * * *

Derivative engine for emissions certification purposes means an engine that has the same or similar emissions characteristics as an engine covered by a U.S. type certificate issued under 14 CFR part 33. These characteristics are specified in § 34.48.

* * * * *

Excepted, as used in § 34.9, means an engine that may be produced and sold that does not meet otherwise applicable standards. Excepted engines must conform to regulatory conditions specified for an exception in § 34.9. Excepted engines are subject to the standards of this part even though they are not required to comply with the otherwise applicable requirements. Engines excepted with respect to certain standards must comply with other standards from which they are not specifically excepted.

Exempt means an engine that does not meet certain applicable standards but may be produced and sold under the terms allowed by a grant of exemption issued pursuant to § 34.7 of this part and part 11 of this chapter. Exempted engines must conform to regulatory conditions specified in the exemption as well as other applicable regulations. Exempted engines are subject to the standards of this part even though they are not required to comply with the otherwise applicable requirements. Engines exempted with respect to certain standards must comply with other standards as a condition of the exemption.

* * * * *

Introduction date means the date of manufacture of the first individual production engine of a given engine model or engine type certificate family to be certificated. Neither test engines nor engines not placed into service affect this date.

* * * * *

Rated output (r0) 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, expressed in kilowatts or kilonewtons (as applicable), rounded to at least three significant figures.

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, rounded to at least three significant figures.

* * * * *

Tier, as used in this part, is a designation related to the NOx emission standard for the engine as specified in § 34.21 or § 34.23 of this part (e.g., Tier 0).

3. In § 34.2, remove the abbreviation for the term “W Watt(s)” and add the abbreviations for the terms “Carbon dioxide”, “Gram(s)”, “Kilonewton(s)”, “Kilowatt(s)”, and “Pound(s)” to read as follows:

§ 34.2 Abbreviations.

* * * * *

CO_2 Carbon dioxide

* * * * *

g Gram(s)

* * * * *

kN Kilonewton(s)

kW Kilowatt(s)

lb Pound(s)

* * * * *

4. In § 34.3, revise paragraphs (c) and (d) to read as follows:

§ 34.3 General requirements.

* * * * *

(c) *U.S. airplanes.* This part 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, this regulation 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 regulation applies only to those foreign civil airplanes that, if registered in the United States, would be required by applicable 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 regulation 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.

5. In § 34.7, amend paragraph (b) by adding a sentence at the end of the paragraph and by revising paragraph (d) to read as follows:

§ 34.7 Exemptions.

* * * * *

(b) * * * This exemption is limited to the requirements of §34.21 only.

* * * * *

(d) Applicants seeking exemption from other emissions standards of this part and 40 CFR part 87**.** Applicants must request exemption from both the FAA and the EPA, even where the underlying regulatory requirements are the same. The FAA and EPA will jointly consider such exemption requests, and will assure consistency in the respective agency determinations.

* * * * *

6. Add § 34.9 to read as follows:

§ 34.9 Exceptions.

(a) Spare engines. Certain engines that meet the following description are excepted:

(1) This exception allows production of an engine for installation on an in-service aircraft. A spare engine may not be installed on a new aircraft.

(2) Each spare engine must be identical to a sub-model previously certificated to meet all applicable requirements.

(3) A spare engine may be used only when the emissions of the spare do not exceed the certification requirements of the original engine, for all regulated pollutants.

(4) No separate approval is required to produce spare engines.

(5) The record for each engine excepted under this paragraph (c) must indicate that the engine was produced as an excepted spare engine.

(6) Engines produced under this exception must be labeled “EXCEPTED SPARE” in accordance with § 45.13 of this chapter.

(b) On and after July 18, 2012, and before August 31, 2013, a manufacturer may produce up to six Tier 4 compliant engines that meet the NOx standards of paragraph (d)(1)(vi) of this section rather than § 34.23 (a)(2). No separate approval is required to produce these engines. Engines produced under this exception are to be labeled "COMPLY" in accordance with § 45.13 of this chapter.

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

7. Revise § 34.10 to read as follows:

§ 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 kN (8,090 lb) 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 kN (8,090 lb) 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 kN (8,090 lb) 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 kN (8,090 lb) rated output and class TP manufactured after January 1, 1975.

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

8. In § 34.21, revise paragraphs (b), (d), (e), and (f), and add paragraph (g) to read as follows:

§ 34.21 Standards for exhaust emission.

* * * * *

(b) Exhaust emissions of smoke from each new aircraft gas turbine engine of class TF and of rated output of 129 kN (29,000 lb) thrust or greater, manufactured on or after January 1, 1976, shall not exceed

$$SN = 83.6\ (rO)^{-0.274}\ (rO \text{ is in kN}).$$

* * * * *

(d) Gaseous exhaust emissions from each new aircraft gas turbine engine shall not exceed:

(1) For Classes TF, T3, T8 engines greater than 26.7 kN (6,000 lb) rated output:

(i) Engines manufactured on or after January 1, 1984:

Hydrocarbons: 19.6 g/kN rO.

(ii) Engines manufactured on or after July 7, 1997:

Carbon Monoxide: 118 g/kN rO.

(iii) Engines of a type or model of which the date of manufacture of the first individual production model was on or before December 31, 1995, and for which the date of manufacture of the individual engine was on or before December 31, 1999 (Tier 2):

Oxides of Nitrogen: (40+2(rPR)) g/kN rO.

(iv) Engines of a type or model of which the date of manufacture of the first individual production model was after December 31, 1995, or for which the date of manufacture of the individual engine was after December 31, 1999 (Tier 2):

Oxides of Nitrogen: (32+1.6(rPR)) g/kN rO.

(v) The emission standards prescribed in paragraphs (d)(1)(iii) and (iv) of this section apply as prescribed beginning July 7, 1997.

(vi) The emission standards of this paragraph apply as prescribed after December 18, 2005. For engines of a type or model of which the first individual production model was manufactured after December 31, 2003 (Tier 4):

(A) That have a rated pressure ratio of 30 or less and a maximum rated output greater than 89 kN:

Oxides of Nitrogen: (19 + 1.6(rPR)) g/kN rO.

(B) That have a rated pressure ratio of 30 or less and a maximum rated output greater than 26.7 kN but not greater than 89 kN:

Oxides of Nitrogen: (37.572 + 1.6(rPR) − 0.2087(rO)) g/kN rO.

(C) That have a rated pressure ratio greater than 30 but less than 62.5, and a maximum rated output greater than 89 kN:

Oxides of Nitrogen: (7 + 2(rPR)) g/kN rO.

(D) That have a rated pressure ratio greater than 30 but less than 62.5, and a maximum rated output greater than 26.7 kN but not greater than 89 kN:

Oxides of Nitrogen: (42.71 + 1.4286(rPR) − 0.4013(rO) + 0.00642(rPR x rO)) g/kN rO.

(E) That have a rated pressure ratio of 62.5 or more:

Oxides of Nitrogen: (32 + 1.6(rPR)) g/kN rO.

(2) For Class TSS Engines manufactured on or after January 1, 1984:

Hydrocarbons: 140 $(0.92)^{rPR}$ g/kN rO.

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

(1) For Class TF of rated output less than 26.7 kN (6,000 lb) manufactured on or after August 9, 1985:

$$SN = 83.6(rO)^{-0.274}$$ (rO is in kN) not to exceed a maximum of SN=50.

(2) For Classes T3, T8, TSS, and TF of rated output equal to or greater than 26.7 kN (6,000 lb) manufactured on or after January 1, 1984:

$$SN = 83.6(rO)^{-0.274}$$ (rO is in kN) not to exceed a maximum of SN=50.

(3) For Class TP of rated output equal to or greater than 1,000 kW manufactured on or after January 1, 1984:

$$SN = 187(rO)^{-0.168}$$ (rO is in kW).

(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 operation cycles and exhaust smoke emission emitted during operation of the engine as specified in the applicable sections of subpart G of this part, and measured and calculated in accordance with the procedures set forth in subpart G.

(g) Where a gaseous emission standard is specified by a formula, calculate and round the standard to three significant figures or to the nearest 0.1 g/kN (for standards at or above 100 g/kN). Where a smoke standard is specified by a formula, calculate and round the standard to the nearest 0.1 SN. Engines comply with an applicable standard if the testing results show that the engine type certificate family's characteristic level does not exceed the numerical level of that standard, as described in § 34.60.

9. Add § 34.23 to read as follows:

§ 34.23 Exhaust Emission Standards for Engines Manufactured On and After July 18, 2012.

The standards of this section apply to aircraft engines manufactured on and after July 18, 2012, unless otherwise exempted or excepted. Where a gaseous emission standard is specified by a formula, calculate and round the standard to three significant figures or to the nearest 0.1 g/kN (for standards at or above 100 g/kN). Where a smoke standard is specified by a formula, calculate and round the standard to the nearest 0.1 SN. Engines comply with an applicable standard if the testing results show that the engine type certificate family's characteristic level does not exceed the numerical level of that standard, as described in § 34.60.

(a) Gaseous exhaust emissions from each new aircraft gas turbine engine shall not exceed:

(1) For Classes TF, T3 and T8 of rated output less than 26.7 kN (6,000 lb) manufactured on and after July 18, 2012:

$$SN = 83.6(rO)^{-0.274} \text{ or } 50.0, \text{ whichever is smaller}$$

(2) Except as provided in §§ 34.9 (b) and 34.21 (c), for Classes TF, T3 and T8 engines manufactured on and after July 18, 2012, and for which the first individual production model was manufactured on or before December 31, 2013 (Tier 6):

Tier 6 Oxides of Nitrogen Emission Standards for Subsonic Engines

Class	Rated pressure ratio - rPR	Rated output rO (kN)	NOx (g/kN)
TF, T3, T8	rPR $\leq$ 30	26.7 < rO < 89.0	38.5486 + 1.6823 (rPR) − 0.2453 (rO) − (0.00308 (rPR) (rO))
		rO > 89.0	16.72 + 1.4080(rPR)
	30 < rPR < 82.6	26.7 < rO ≤ 89.0	46.1600 + 1.4286 (rPR) − 0.5303 (rO) + (0.00642 (rPR) (rO))
		rO > 89.0	–1.04 + 2.0 (rPR)
	rPR $\geq$ 82.6	All	32 + 1.6 (rPR)

(3) Engines exempted from paragraph (a)(2) of this section produced on or before December 31, 2016 must be labeled "EXEMPT NEW" in accordance with § 45.13 of this chapter. No

exemptions to the requirements of paragraph (a)(2) of this section will be granted after December 31, 2016.

(4) For Class TSS Engines manufactured on and after July 18, 2012:

Gaseous Emission Standards for Supersonic Engines

Class	Rated output rO[1] (kN)	NOx (g/kN)	CO (g/kN)
TSS	All	36 + 2.42 (rPR)	4,550 $(rPR)^{-1.03}$

[1] rO is the rated output with afterburning applied

(b) Gaseous exhaust emissions from each new aircraft gas turbine engine shall not exceed:

(1) For Classes TF, T3 and T8 engines of a type or model of which the first individual production model was manufactured after December 31, 2013 (Tier 8):

Tier 8 Oxides of Nitrogen Emission Standards for Subsonic Engines

Class	Rated pressure ratio - rPR	Rated output rO (kN)	NOx (g/kN)
TF, T3, T8	rPR ≤ 30	26.7 < rO < 89.0	40.052 + 1.5681 (rPR) − 0.3615 (rO) − (0.0018 (rPR) (rO))
		rO > 89.0	7.88 + 1.4080 (rPR)
	30 < rPR < 104.7	26.7 < rO < 89.0	41.9435 + 1.505 (rPR) − 0.5823 (rO) + (0.005562 (rPR) (rO))
		rO > 89.0	–9.88 + 2.0 (rPR)
	rPR ≥ 104.7	All	32 + 1.6 (rPR)

(c) Engines (including engines that are determined to be derivative engines for the purposes of emission certification) type certificated with characteristic levels at or below the NOx standards of § 34.21 (d)(1)(vi) of this part (as applicable based on rated output and rated pressure ratio) and introduced before July 18, 2012, may be produced through December 31, 2012, without meeting the NOx standard of paragraph (a)(2) of this section.

10. In § 34.31, revise paragraphs (b) and (c) to read as follows:

§ 34.31 Standards for exhaust emissions.

* * * * *

(b) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of Class TF and of rated output of 129 kN (29,000 lb) thrust or greater, beginning January l, 1976, shall not exceed

$$SN=83.6(rO)^{-0.274} (rO \text{ is in kN}).$$

(c) The standards set forth in paragraphs (a) and (b) of this section refer to exhaust smoke emission emitted during operation of the engine as specified in the applicable sections of subpart G of this part, and measured and calculated in accordance with the procedures set forth in subpart G.

Subpart E – Certification Provisions

11. Add § 34.48 to read as follows:

§ 34.48 Derivative engines for emissions certification purposes.

(a) General. A derivative engine for emissions certification purposes is an engine configuration that is determined to be similar in design to a previously certificated (original) engine for purposes of compliance with exhaust emissions standards (gaseous and smoke). A type certificate holder may request from the FAA a determination that an engine configuration is considered a derivative engine for emissions certification purposes. To be considered a derivative engine for emission purposes under this part, the configuration must have been derived from the original engine that was certificated to the requirements of part 33 of this chapter and one of the following:

(1) The FAA has determined that a safety issue exists that requires an engine modification.

(2) Emissions from the derivative engines are determined to be similar. In general, this means the emissions must meet the criteria specified in paragraph (b) of this section. The FAA

may amend the criteria of paragraph (b) in unusual circumstances, for individual cases, consistent with good engineering judgment.

(3) All of the regulated emissions from the derivative engine are lower than the original engine.

(b) Emissions similarity. (1) The type certificate holder must demonstrate that the proposed derivative engine model's emissions meet the applicable standards and differ from the original model's emission rates only within the following ranges:

(i) ± 3.0 g/kN for NOx.

(ii) ± 1.0 g/kN for HC.

(iii) ± 5.0 g/kN for CO.

(iv) ± 2.0 SN for smoke.

(2) If the characteristic level of the original certificated engine model (or any other sub-models within the emission type certificate family tested for certification) before modification is at or above 95% of the applicable standard for any pollutant, an applicant must measure the proposed derivative engine model's emissions for all pollutants to demonstrate that the derivative engine's resulting characteristic levels will not exceed the applicable emission standards. If the characteristic levels of the originally certificated engine model (and all other sub-models within the emission type certificate family tested for certification) are below 95% of the applicable standard for each pollutant, the applicant may use engineering analysis consistent with good engineering judgment to demonstrate that the derivative engine will not exceed the applicable emission standards. The engineering analysis must address all modifications from the original engine, including those approved for previous derivative engines.

(c) Continued production allowance. Derivative engines for emissions certification purposes may continue to be produced after the applicability date for new emissions standards when the engines conform to the specifications of this section.

(d) Non-derivative engines. If the FAA determines that an engine model does not meet the requirements for a derivative engine for emissions certification purposes, the type certificate holder is required to demonstrate that the engine complies with the emissions standards applicable to a new engine type.

Subpart G — Test Procedures for Engine Exhaust Gaseous Emissions (Aircraft and Aircraft Gas Turbine Engines)

12. Revise § 34.60 to read as follows:

§ 34.60 Introduction.

(a) Use the equipment and procedures specified in Appendix 3, Appendix 5, and Appendix 6 of ICAO Annex 16, as applicable, to demonstrate whether engines meet the applicable gaseous emission standards specified in subpart C of this part. Measure the emissions of all regulated gaseous pollutants. Use the equipment and procedures specified in Appendix 2 and Appendix 6 of ICAO Annex 16 to determine whether engines meet the applicable smoke standard specified in subpart C of this part. The compliance demonstration consists of establishing a mean value from testing the specified number of engines, then calculating a "characteristic level" by applying a set of statistical factors that take into account the number of engines tested. Round each characteristic level to the same number of decimal places as the corresponding emission standard. For turboprop engines, use the procedures specified for turbofan engines, consistent with good engineering judgment.

(b) Use a test fuel that meets the specifications described in Appendix 4 of ICAO Annex 16. The test fuel must not have additives whose purpose is to suppress smoke, such as organometallic compounds.

(c) Prepare test engines by including accessories that are available with production engines if they can reasonably be expected to influence emissions. The test engine may not extract shaft power or bleed service air to provide power to auxiliary gearbox-mounted components required to drive aircraft systems.

(d) Test engines must reach a steady operating temperature before the start of emission measurements.

(e) In consultation with the EPA, the FAA may approve alternative procedures for measuring emissions, including testing and sampling methods, analytical techniques, and equipment specifications that differ from those specified in this part. Manufacturers and operators may request approval of alternative procedures by written request with supporting justification to the FAA Aircraft Certification Office and to the Designated EPA Program Officer. To be approved, one of the following conditions must be met:

(1) The engine cannot be tested using the specified procedures; or

(2) The alternative procedure is shown to be equivalent to, or more accurate or precise than, the specified procedure.

(f) The following landing and takeoff (LTO) cycles apply for emissions testing and for calculating weighted LTO values:

LTO Test Cycles and Time in Mode

Mode	Class					
	TP		TF, T3, T8		TSS	
	TIM (min)	% of rO	TIM (min)	% of rO	TIM (min)	% of rO
Taxi/idle	26.0	7	26.0	7	26.0	5.8
Takeoff	0.5	100	0.7	100	1.2	100
Climbout	2.5	90	2.2	85	2.0	65
Descent	NA	NA	NA	NA	1.2	15
Approach	4.5	30	4.0	30	2.3	34

(g) Engines comply with an applicable standard if the testing results show that the engine type certificate family's characteristic level does not exceed the numerical level of that standard, as described in the applicable appendix of Annex 16.

(h) The system and procedure for sampling and measurement of gaseous emissions shall be as specified by in Appendices 2, 3, 4, 5 and 6 to the International Civil Aviation Organization (ICAO) Annex 16, Environmental Protection, Volume II, Aircraft Engine Emissions, Third Edition, July 2008. 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 ICAO, Document Sales Unit, 999 University Street, Montreal, Quebec H3C 5H7, Canada, phone +1 514–954–8022, or www.icao.int or sales@icao.int. Copies can be reviewed at the FAA New England Regional Office, 12 New England Executive Park, Burlington, Massachusetts, 781–238–7101, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

§§ 34.61-34.64—[Reserved]

13. Remove and reserve §§ 34.61-34.64.

§ 34.71—[Reserved]

14. Remove and reserve § 34.71.

Subpart H—[Removed]

15. Remove subpart H, consisting of §§ 34.80 through 34.89 .

PART 45 – IDENTIFICATION AND REGISTRATION MARKING

16. The authority citation for Part 45 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40103, 40113-40114, 44101-44105, 44107-44111, 44504, 44701, 44708-44709, 44711-44713, 44725, 45302-45303, 46104, 46304, 46306, 47122.

Subpart B – Identification of Aircraft and Related Products

17. In § 45.13, revise paragraph (a)(7) introductory text and add paragraphs (a)(7)(iv) and (a)(7)(v) 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 this chapter, and a designation, approved by the FAA, that indicates compliance with the applicable exhaust emission provisions of part 34 of this chapter and 40 CFR part 87. Approved designations include COMPLY, EXEMPT, and NON-US, as appropriate. After December 31, 2012, approved designations also include EXEMPT NEW, and EXCEPTED SPARE, as appropriate.

* * * * *

(iv) The designation EXEMPT NEW indicates that the engine has been granted an exemption pursuant to the applicable provision of § 34.7 (h) of this chapter; the designation must be noted in the permanent powerplant record that accompanies the engine from the time of its manufacture.

(v) The designation EXCEPTED SPARE indicates that the engine has been excepted pursuant to the applicable provision of § 34.9 (b) of this chapter; the designation must be noted in the permanent powerplant record that accompanies the engine from the time of its manufacture.

* * * * *

Issued in Washington, DC on December 14, 2012. .

Michael P. Huerta

Acting Administrator

[FR Doc. 2012-31109 Filed 12/28/2012 at 8:45 am; Publication Date: 12/31/2012]