Proposed Rules

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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 21, 38, 121, and 125

[Docket No.: FAA–2022–0241; Notice No. 22–03]

RIN 2120–AL54

Airplane Fuel Efficiency Certification

AGENCY: Federal Aviation Administration (FAA), Transportation (DOT).

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This action proposes fuel efficiency requirements for certification of certain airplanes. These certification requirements would implement the emissions standards adopted by the Environmental Protection Agency, allowing manufacturers to certificate their aircraft for fuel efficiency in the United States, and fulfilling the statutory obligations of the FAA under the Clean Air Act.

DATES: Send comments on or before August 15, 2022.

ADDRESSES: Send comments identified by docket number FAA–2022–0241 using any of the following methods:

- *Federal eRulemaking Portal:* Go to *www.regulations.gov* and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M–30; U.S. Department of Transportation (DOT), 1200 New Jersey Avenue SE, Room W12–140, West Building Ground Floor, Washington, DC 20590–0001.
- *Hand Delivery or Courier:* 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 holidays.
- *Fax:* Fax comments to Docket Operations at 202–493–2251.

Privacy: In accordance with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform its rulemaking process. DOT posts these comments, without edit, including any personal information the commenter provides, to *www.regulations.gov,* as described in the system of records notice (DOT/ALL–14 FDMS), which can be reviewed at *www.dot.gov/privacy.*

Docket: Background documents or comments received may be read at *www.regulations.gov* at any time. Follow the online instructions for accessing the docket or go to the 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.

FOR FURTHER INFORMATION CONTACT: For technical questions concerning this action, contact Ralph Iovinelli, Office of Policy, International Affairs & Environment, Emissions Division (AEE–300), Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591; telephone 202–267–3566; email *ralph.iovinelli@faa.gov.*

SUPPLEMENTARY INFORMATION:

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.

The authority to insure compliance with aviation emission standards adopted by the United States Environmental Protection Agency (EPA) is granted to the Secretary of Transportation in the Clean Air Act Amendments of 1970 (CAA), title 42 of the United States Code (U.S.C.), Chapter 85, Subchapter II, part B, Section 7572. Further, 49 CFR 1.83(c) delegates to the FAA Administrator the authority to ''Carry out the functions vested in the Secretary by part B of title II of the CAA.''

This rulemaking proposes regulations to insure compliance with the standards adopted by the EPA under the CAA in 40 CFR part 1030 to control the emission of certain greenhouse gas emissions from airplanes. This rulemaking is issued under the authority described in 42 U.S.C. 7572 and 49 CFR 1.83(c).

I. Background

As a signatory State to the International Civil Aviation Organization's (ICAO) Chicago Convention, the United States must establish minimum standards consistent with ICAO or file a difference. The Committee on Aviation Environmental Protection (CAEP) is a technical committee of ICAO that assists in formulating ICAO policy and in adopting Standards and Recommended Practices related to aircraft noise and emissions. The FAA represents the United States on CAEP, attending annual Steering Group meetings and CAEP triennial meetings, and contributing technical expertise to CAEP's many working groups. The EPA serves as an advisor to the U.S. member of CAEP at the annual and triennial meetings, and contributes technical expertise to the FAA and CAEP's working groups on aviation emissions, pollution control technology, and environmental policy. Within CAEP, the FAA assists and advises the EPA on aviation-specific environmental issues, airplane and engine technologies, and airworthiness certification matters.

In 2009, the ICAO Council and its Group on International Aviation and Climate Change (GIACC) developed a ''Programme of Action'' to limit or reduce the impact of aviation on the climate. The program's ''basket of measures'' included the reduction of the carbon footprint of international civil aviation, beginning with the development of a technology-based certification standard for carbon dioxide (CO_2) emissions from subsonic airplanes.

The CO_2 standard-setting process included input from governments, aircraft and engine manufacturers, non-governmental environmental organizations, research institutions, and academics worldwide. The standard-setting process occurred in two 3-year phases. The first phase focused on the development of the CO_2 certification requirement (a CO_2 metric, test procedures, and measurement methodology). The second phase focused on the development of the CO_2 standard itself (establishing regulatory limits, applicability, and assessments of cost effectiveness). The principles and key criteria that guided the process included the concepts that:

—No certification requirement compromise aircraft safety;
—Airplane CO_2 emissions be reduced through the integration of fuel

efficient technologies in airplane type designs;
—Airplanes that incorporate differing generations of CO_2 reduction technologies be treated fairly and equitably;
—Any standard be independent of airplane size, purpose or utilization;
—The metric be robust and minimize unintended airplane and system design consequences;
—Any standard should use industry standard practices of measurement and correction; and
—The implementation of any standard reflects a manageable and appropriate level of resources to be expended by national airworthiness authorities and manufacturers.

In February 2016, CAEP agreed on a new CO_2 emission standard for certain airplanes. It was adopted by ICAO in March 2017 as Annex 16, Volume III.[1]

In the United States, the CAA directs the U.S. EPA to adopt standards applicable to the emission of any air pollutant from any class of aircraft engines. The CAA also directs the Secretary of Transportation (and by delegation, the Administrator of the FAA) to implement the standards adopted by the EPA, which takes place by the adoption of regulations in title 14 of the Code of Federal Regulations (CFR) that allow the certification of aircraft and aircraft engines to the EPA standard.

On January 11, 2021, the EPA published a final rule [2] adopting new domestic airplane greenhouse gas (GHG) emissions standards in new 40 CFR part 1030. In accordance with the CAA, the FAA is proposing new certification regulations for certain airplanes to insure compliance with those standards. The applicability of these proposed regulations and the regulatory emissions limits in the United States are the same as those adopted by ICAO as its airplane CO_2 emission standard.

The FAA, EPA and ICAO each use different terminology to reference the same standards. In Annex 16 volume III, ICAO references its standard as CO_2 emissions because the amount of CO_2 emitted is directly proportional to the amount of fuel burned by an airplane at cruise speed and altitude. It is a commonly used term that fits well within ICAO's international goals to reduce the carbon footprint of aviation. The EPA rule references GHGs in recognition of airplane emissions of CO_2 and another GHG, nitrous oxide (N_2O). The EPA did not set limits on N_2O emissions, noting that they are small and are proportionally reduced as CO_2 is reduced. The FAA describes these same limits and procedures as measures of fuel efficiency since this proposed rule prescribes a measurement of aircraft performance determined by the specific air range (SAR) parameter to determine fuel efficiency. The three concepts—FAA's proposed fuel efficiency, the EPA's GHG emissions, and ICAO's CO_2 emissions—are to be considered equivalent for purposes of implementation. The FAA is also making draft guidance material for part 38 available at the same time as this proposed rule, and has placed that draft Advisory Circular in the docket for comment.

II. Discussion of the Proposal

Since this document proposes an entire new part in 14 CFR, the word ''proposed'' has been eliminated throughout this preamble when referencing material for part 38 or its appendix. The term remains when discussing material that proposes to amend other parts of 14 CFR.

A. General

Since the CAA vests authority to regulate airplane emissions with both the EPA and the FAA, the regulations adopted by each agency bear a particular relationship to each other. In January 2021, the EPA adopted regulations limiting the GHG emissions from certain airplanes in 40 CFR part 1030. The emission standard described by the FAA here as new 14 CFR part 38 is intended to be the same as that adopted by the EPA. In the event that the EPA changes the standard in 40 CFR part 1030, and until part 38 is amended with the same change, a certification applicant may request a waiver of those provisions as they appear in part 38 and instead comply with 40 CFR part 1030 (see § 38.9 (Relationship to other regulations)).

The FAA is including a definitions section as § 38.3 that includes terms specific to fuel efficiency certification. The term that may be less familiar is Maximum Take Off Mass (MTOM), which is the international standard term for aircraft weight expressed in kilograms. Terms that are used in 40 CFR part 1030 will carry the same meaning when used in part 38, unless otherwise defined in part 38 (see § 38.3 (Definitions)). The FAA has followed this process for changes to the aircraft engine emissions standards adopted in 14 CFR part 34, which were also promulgated under the CAA paradigm. Finally, § 38.7 (Reserved) will list the materials to be incorporated by reference into part 38 when those materials are determined.

As developed by ICAO, the standard adopted by the EPA includes three occasions at which an airplane becomes subject to the GHG standards. These same applicability points are proposed here: at new type certification, the manufacture of any covered airplane after January 1, 2028, and when an airplane modification that triggers the criteria is made. While all three are contained in the applicability criteria of § 38.1, the change criteria are also described in further detail in § 38.19.

B. Applicability (§ 38.1)

Section 38.1 describes the airplanes subject to the rule. Although the ICAO standard on which these regulations are based was effective January 1, 2020, the effective date of the EPA regulation implementing the standard is January 11, 2021. Except for the effective date, the EPA and FAA regulations are intended to have the same applicability as ICAO's standard. The difference in effective dates between the ICAO and EPA standards had no practical effect in the United States. In the twelve months between the effective date of the ICAO standard and the effective date of the EPA standards, the FAA received no applications for type certification for any applicable airplane type. While the emission standard is now applicable in the United States through 40 CFR part 1030, the FAA is not aware of any new airplane model for which a type certification application would be submitted before the certification regulations here are expected to be adopted. Once an airplane is type-certificated for fuel efficiency in accordance with this rule, all airplanes produced under that type certificate must comply with the fuel efficiency requirements.

In reviewing the EPA standard as part of the development of this rule, the FAA determined that the difference between applicability statements in ICAO's Standards and Recommended Practices and those in the EPA and FAA regulations resulted in certain airplanes being omitted from the EPA applicability section. Those airplanes are described in § 38.1(a)(1)(iv)–(vi). The airplanes would have a maximum takeoff mass (MTOM) of more than 60,000 kg and be type-certificated for a maximum passenger seating capacity of

[1] Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume III, *Aeroplane CO_2 Emissions,* First Edition, July 2017. *https://store.icao.int/collections/annex-16-environmental-protection/products/annex-16-environmental-protection-volume-iii-aeroplane-co2-emissions.*

[2] 86 FR 2136–2174, Final Rule, 40 CFR parts 87 and 1030, *Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures,* Environmental Protection Agency.

19 seats or fewer. The FAA has advised the EPA of this finding and of the inclusion of the airplanes in part 38 applicability.

An airplane that was type-certificated before the applicable compliance date listed in § 38.1 may be required to demonstrate compliance with the fuel efficiency standard if certain modifications to the airplane that, in general, would affect the fuel efficiency of the airplane, are incorporated after January 1, 2023 (§ 38.1(a)(4) and (5)). Changes to airplanes and the effect of those changes on compliance with the fuel efficiency regulations are discussed more fully in the section on change criteria (section G.) below.

Included in the applicability section is the requirement that all covered airplanes manufactured after January 1, 2028, regardless of the date of type certification, would have to meet the fuel efficiency requirements of part 38. Airplanes manufactured after that date would not be eligible for an original certificate of airworthiness unless compliance with part 38 has been shown. This manufacturing cutoff date effectively places a cutoff on the period during which an airplane not previously certificated for fuel efficiency might become subject to the requirement by introducing a modification, as described in the section below on change criteria.

The applicability section of part 38 is particularly complex and examples of the effect of this part on selected popular operational categories of airplanes is summarized in table 1 below.

TABLE 1—QUICK REFERENCE FOR APPLICABILITY

Individual airplane status	Applicability today	Applicability when modified	Effective dates for applicability of part 38	Fuel efficiency metric (FEM) limit	Note
In service, and type is no longer being produced EX: 757.	None	none	none	none	May voluntarily apply to establish an FEM value. Status would only change if a new airplane is produced.
In service, and new airplanes still being produced EX: 737 MAX 8.	None	Must comply with the in-production limit if: (1) produced after 1/1/2023 and (2) includes a modification that changes the FEM value (§ 38.19(c)).	1/1/2023 for modified airplanes § 38.1(a)(4)–(5). 1/1/2028 for all new production § 38.1(a)(6)–(7).	In-production limit § 38.17(a)(5)–(8).	[intentionally left blank]
New Type: large jet airplanes and propeller-driven airplanes produced under new type certificates applied for after 1/11/2021.	§ 38.1(a)(1) and (3).	All airplanes; New certification required if triggered by change criteria (§ 38.19(a)).	1/11/2021	New type limit § 38.17(a)(1)–(4).	[intentionally left blank]
New Type: small airplanes produced under new type certificates applied for after 1/1/2023.	§ 38.1(a)(2)	All airplanes; New certification required if triggered by change criteria (§ 38.19(a)).	1/1/2023	New type limit § 38.17(a)(1).	[intentionally left blank]

The FAA is proposing the same exclusions to part 38 that were adopted by the EPA and ICAO. Part 38 would not apply to airplanes with lesser MTOMs (jets or propeller-driven airplanes) as indicated in § 38.1(c). Airplanes that are designed for specialized operations (including the presence of unique design features to carry out those operations) also would be excluded from part 38, subject to a determination that a design for specialized operation is detrimental to fuel efficiency. This determination would be made by the FAA when an airplane is presented for certification. Examples of such airplanes could include specialized cargo features, specialized missions, or crop dusting. Amphibious airplanes (as defined in § 38.3), airplanes that have no pressurized areas (described as having zero reference geometric factor (RGF)), airplanes designed for firefighting, and airplanes powered by reciprocating aircraft engines also would be excluded.

C. Compatibility With Airworthiness Requirements (§ 38.4)

Section 38.4 addresses historical issues of compatibility between environmental and airworthiness standards. This section is intended to prohibit the sequencing of certification tests for an airplane that has not met the applicable airworthiness requirements. This requirement would ensure that critical airplane configuration is established before fuel efficiency certification tests are conducted, and that no airworthiness standards are compromised during the fuel efficiency certification. In addition, the FAA proposes to require that all of the procedures used to conduct the flights that demonstrate fuel efficiency compliance be conducted in compliance with all airworthiness regulations that apply to the airplane.

D. Exemptions (§ 38.5)

In accordance with 42 U.S.C. 7572, 49 CFR 1.83(a)(6) and (c), and 49 U.S.C. 44701(f), the FAA may issue exemptions from its regulations when such exemption would be in the public interest. Section 38.5 states that petitions for exemption from any requirement in part 38 be submitted in accordance with 14 CFR part 11. In addition, this section notes that the FAA would consult with the EPA on any request for exemption from the regulations of part 38. This process is the same as that followed when the FAA considers petitions for exemption from the engine emissions standards promulgated by the EPA under 40 CFR part 87, and by the FAA in 14 CFR part 34.

E. Fuel Efficiency Metric (§ 38.11)

The fuel efficiency of an airplane is determined by the amount of fuel it uses to travel a certain distance under prescribed conditions. This measure is the fuel efficiency metric (FEM). For each airplane subject to part 38 (including an airplane subject to the change criteria of § 38.19), § 38.11 would require an FEM value to be calculated using an equation identical to the one adopted by the EPA in 40 CFR 1030.20. As described in § 38.11, the two primary components of the FEM to be certificated are the specific air range

(SAR) (described in § 38.13) and the reference geometric factor (RGF) (described in § 38.15). SAR is a familiar aeronautical parameter used in the aviation industry to represent the distance an airplane can travel per unit of fuel consumed. It measures the instantaneous fuel efficiency of an airplane at any point during stable cruise flight. The RGF is a representation of airplane fuselage size based on productivity or load carrying capability. The RGF parameter is based on the floor area of pressurized space in an airplane, and is flexible enough to account for single or multi-deck airplanes. Dividing SAR by RGF results in a universal equation to denote the fuel efficiency of any airplane regardless of size. This is the FEM.

F. Fuel Efficiency Regulatory Limits (§ 38.17)

Section 38.17 incorporates as fuel efficiency limits the emission standards adopted by the EPA in 40 CFR 1030.30. Airplanes subject to part 38 would be required to demonstrate that the FEM value does not exceed the fuel efficiency limits in § 38.17. Using the applicable provision in § 38.1, the fuel efficiency limit is calculated using the airplane's MTOM and the equations listed in the last column of the table in § 38.17(b). An airplane's FEM value may not exceed the maximum FEM value calculated using the fuel efficiency limits in this rule.

For the airplanes omitted from the applicability section in the EPA regulations (jet airplanes with a maximum passenger seating capacity of 19 or fewer seats and a MTOM greater than 60,000kg, and for which application for original type certification is submitted on or after January 11, 2021), the standard associated with the airplane's MTOM is applied rather than its seating capacity, which is consistent with the ICAO standard. These airplanes would carry the applicability in § 38.1(a)(1) and would be required to meet the fuel efficiency limits in § 38.17(b)(3) and (4).

G. Change Criteria (§ 38.19)

The third occasion at which the fuel efficiency requirement would apply is at the time certain modifications are made. Section 38.19 would adopt the EPA airplane change criteria of 40 CFR 1030.35. Airplanes routinely have modifications incorporated into their designs. A modification may change the compliance status of an airplane under part 38, regardless of whether it was required to demonstrate compliance with part 38 at the time of certification. The modifications affecting compliance are described by the change criteria in § 38.19. The requirements differ depending on whether an airplane has demonstrated compliance (at certification) before a modification is made, or for an airplane that was type certificated before January 11, 2021, and was not required to demonstrate compliance.

First, if an airplane that was previously certificated for fuel efficiency under part 38 undergoes a modification that increases its MTOM, the applicant must demonstrate compliance with the applicable fuel efficiency limit of § 38.17, regardless of whether there is a change in the airplane's FEM value.

If the MTOM of a modified airplane is not increased, the applicant must show compliance with part 38 if the FEM value of the airplane increases by more than the criteria specified in § 38.19(a)(2). For example, the addition of a satellite antenna on top of the fuselage of an airplane with a MTOM of 60,000 kg may not affect the airplane's MTOM, but may adversely affect the airplane's FEM value by increasing drag. If this 60,000kg MTOM modified airplane shows an increase of FEM value of more than 0.75% (as calculated under § 38.19(a)(2)), the applicant would need to demonstrate compliance with the fuel efficiency limit that was established for the prior version of the airplane.

If the FEM value of the modified airplane increases by less than 0.75%, no new demonstration of compliance would be required. When no demonstration of compliance is required, the applicant may choose to use the FEM value of the unmodified version of the airplane under § 38.19(b), or it may choose to establish a new FEM value.

Second, as provided in § 38.1(a)(4) or (5), if a modification is made to an airplane not previously certificated for fuel efficiency, it may be subject to the requirements of part 38 depending upon the effect of the modification on the FEM value. Section 38.19(c) requires that if a modified airplane has an increase in FEM value of more than 1.5% over the unmodified version, the applicant must demonstrate compliance with the fuel efficiency limit of § 38.17. The fuel efficiency limits for these airplanes are shown in § 38.17(b)(5) through (8). These change criteria apply to airplanes for which an application for the modification in type design is submitted on or after January 1, 2023.

Finally, § 38.1(a)(6) and (7), which require that all covered airplanes produced after January 1, 2028, demonstrate compliance with the fuel efficiency standard (regardless of when the airplane model was originally type certificated), effectively limit to five years the applicability of the 2023 provisions established in § 38.1(a)(4) and (5). For aircraft that were not required to demonstrate compliance with the standard at certification, the effective period of the change criteria trigger for compliance is January 1, 2023, to December 31, 2027. For aircraft that have been previously required to demonstrate compliance with the standard at type certification or production, the change criteria of § 38.19 would continue to apply.

Examples of the limits on allowable changes after modification are illustrated in Figure 1, Changes to FEM following modification.

The example on the left of the chart is for an airplane that was type certificated before January 11, 2021 (In-production limit/hashed line with applicable regulations noted), that was not required to demonstrate compliance with part 38. The dot on the chart represents the airplane before the modification in question. An airplane that is modified complies with part 38 if it stays below the hashed line (the triangle), even if the FEM is higher than the unmodified airplane. If the modification results in an FEM above the hashed line (the square), the modified airplane would not be compliant with part 38 and would not be issued an airworthiness certificate. The example illustrates a concurrent increase in MTOM, which may not occur.

The example on the right is for an airplane type certificated after January 11, 2021, that has demonstrated compliance with part 38 at type certification (solid line, with applicable regulations noted). The result is the same, with a modified airplane being required to stay below the limit line for new airplane types (denoted by the triangle relative to the solid regulatory line). The illustration emphasizes the fact that airplanes produced under a new type certificate (subject to the solid line) do not become ''in-production'' airplanes that may use the higher FEM limit (the square) when produced after initial part 38 certification. The designation of ''in-production'' versus ''new airplane type'' under the change criteria is established as of January 11, 2021, not the date of individual airplane production, and the FEM limit (line) for modified airplanes does not change afterwards.

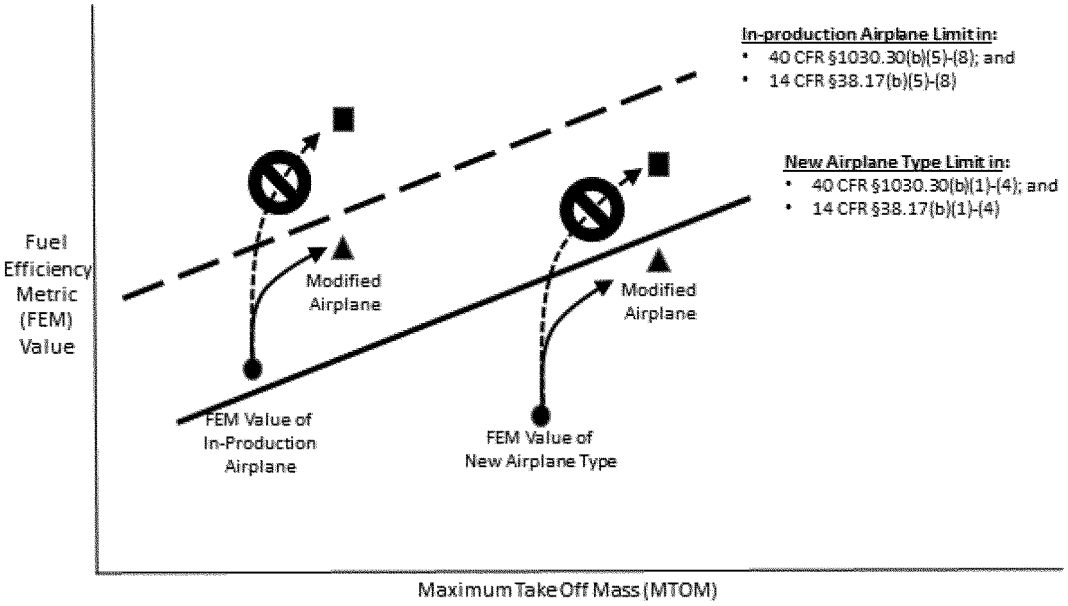


Figure 1: Changes to FEM following modification.

H. Approval Before Compliance Testing (§ 38.21)

Section 38.21 would require FAA approval of all procedures, weights, configurations, and other information that are necessary to calculate the fuel efficiency metric value of an airplane. Such approvals are necessary to ensure the airplane configuration and fuel efficiency certification procedures are established and remain unchanged before fuel efficiency compliance tests are actually conducted. This section would not be applied to data submitted for validation following fuel efficiency certification by another authority.

I. Manual Information and Limitations (§ 38.23)

The final section of part 38 would require that the fuel efficiency metric value of the airplane, along with other part 38 compliance information, must be placed in an FAA-approved section of the flight manual of the airplane. Inclusion of this information in the approved airplane flight manual would provide owners, operators, and flight crew with information regarding the airplane's compliance with part 38. The FAA also proposes to require that if a weight less than the MTOM is used for fuel efficiency certification, then that lower weight becomes an operating limitation for that airplane and must be included in the operating limitations section of the flight manual. Operators may not exceed the weight at which compliance with part 38 was demonstrated, even if that weight is lower than the MTOM for the airplane under other airworthiness requirements.

J. Appendix A to Part 38

Appendix A to part 38 provides the technical detail needed to determine the fuel efficiency metric value of an airplane required to demonstrate compliance with part 38. The primary sources of the information contained in the appendix are Sections 2.5 and 2.6 of ICAO Annex 16, Volume III, including appendices 1 and 2 to that volume. The FAA is not proposing the incorporation by reference of Volume III. Instead, part 38 was drafted to include the material from Volume III using current U.S. certification terminology, format, and references.

Appendix A details the processes and procedures to be used when measuring an airplane for fuel efficiency. To comply with part 38, a certification applicant would need to determine the core elements of the fuel efficiency metric, specifically the specific air range and reference geometric factor. The specifications for the flight tests to gather airplane performance data are provided in this appendix, as well as the formulas to be used to determine specific air range and the reference geometric factor from the data gathered during testing. The appendix also describes the certification data that would be submitted to the FAA in the certification test report that is a part of fuel efficiency certification.

K. Other Revisions to 14 CFR

This proposal sets forth several amendments to part 21 to include compliance with part 38 as a requirement for type, supplemental type, or airworthiness certification using the applicability described in § 38.1. The proposed amendments to part 21 include references to proposed part 38 in §§ 21.5, 21.17, 21.29, 21.31, 21.93, 21.115, 21.183, and 21.187.

While revising the text for part 21 to include references to proposed part 38, an error was discovered in § 21.187. The text of § 21.187(c) should have been designated as paragraph (a)(3) because the applicability of part 34 needs the introductory text of paragraph (a) to be read correctly. This rule proposes to move and redesignate § 21.187(c) as § 21.187(a)(3), with the requirement to comply with part 38 added as § 21.187(a)(4).

This proposed rule includes amendments to the operating regulations for airplanes subject to part 38. Revisions to §§ 121.141 and 125.75 are included to add the certification information for fuel efficiency to the airplane flight manuals for airplanes subject to part 38.

III. Regulatory Notices and Analyses

Federal agencies consider impacts of regulatory actions under a variety of executive orders and other requirements. 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 the costs. Second, the Regulatory Flexibility Act of 1980 (Pub. L. 96–354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Pub. L. 96–39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 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 that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100,000,000 or more (adjusted annually for inflation) in any one year. The current threshold after adjustment for inflation is $158,000,000, using the most current (2020) Implicit Price Deflator for the Gross Domestic Product. The FAA has provided a detailed Regulatory Impact Analysis (RIA) in the docket for this rulemaking. This portion of the preamble summarizes the FAA's analysis of the economic impacts of this rule.

In conducting these analyses, the FAA has determined that this rule: will result in benefits that justify costs; is not a ''significant regulatory action'' as defined in section 3(f) of Executive Order 12866; will not have a significant economic impact on a substantial number of small entities; will not create unnecessary obstacles to the foreign commerce of the United States; and will not impose an unfunded mandate on State, local, or tribal governments, or on the private sector.

A. Regulatory Impact Analysis

The FAA identified three U.S. manufacturers that would be affected by the proposed rule. Manufacturers will incur certification costs even in the absence of the proposed rule since they would pursue certification with foreign authorities.[3] Certification tasks will vary greatly depending on the stage of the airplane development process (*e.g.,* new type certificate, supplemental type certificate). Additionally, the first fuel efficiency certification project undertaken by any one manufacturer may require more resources because of the new processes and the need for new data generation. The FAA used information provided by the affected airplane manufacturers to construct a timeline of when these costs would be incurred over the next 10 years (starting in 2022), and the cost savings from domestic certification enabled by the proposed rule.

Because the EPA standard applies to airplanes certificated in the United States even in the absence of the proposed rule, there are no incremental benefits associated with the FAA's action; however, the proposed rule will result in cost savings by enabling U.S. manufacturers to certificate to the EPA standard [4] rather than the requirements of a foreign authority. Annualized costs savings may be approximately $0.4 million using discount rates of 3 percent and 7 percent (a present value over 10 years of $3.12 million to $2.6 million, using discount rates of 3 percent and 7 percent, respectively). For more details, see the Regulatory Impact Analysis (RIA) for this proposed rule, which has been placed in the rule docket.

B. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) of 1980, Public Law 96–354, 94 Stat. 1164 (5 U.S.C. 601–612), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (Pub. L. 104–121, 110 Stat. 857, Mar. 29, 1996) and the Small Business Jobs Act of 2010 (Pub. L. 111–240, 124 Stat. 2504 Sept. 27, 2010), requires Federal agencies to consider the effects of the regulatory action on small business and other small entities and to minimize any significant economic impact. The term ''small entities'' comprises small businesses and not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental jurisdictions with populations of less than 50,000.

As described in the RIA, the FAA identified three U.S. manufacturers that would be affected by the proposed rule. Based on the Small Business Administration (SBA) size standard for aircraft manufacturing (Table 1), all three manufacturers are large businesses. If an agency determines that a rulemaking will not result in a significant economic impact on a substantial number of small entities, the head of the agency may so certify under section 605(b) of the RFA. Therefore, as provided in section 605(b) and based on the foregoing, the head of FAA certifies that this rulemaking will not result in a significant economic impact on a substantial number of small entities. The FAA welcomes comments on the basis for this certification.

TABLE 2—SMALL BUSINESS SIZE STANDARDS: AIR TRANSPORTATION

NAICS code	Description	Size standard
336411 ...	Aircraft manufacturing	1,500 employees.

Source: SBA (2019).[5]
NAICS = North American Industrial Classification System.

C. International Trade Impact Assessment

The Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 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 effects of this rule and finds that it does not create an unnecessary obstacle to foreign commerce. The United States has adopted the same airplane emission standard as ICAO and many of its member States. This proposed rule is the next step in insuring compliance with the internationally recognized standard.

D. Unfunded Mandates Assessment

The Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1531–1538) governs the issuance of Federal regulations that require unfunded mandates. An unfunded mandate is a regulation that requires a State, local, or tribal government or the private sector to incur direct costs without the Federal Government having first provided the funds to pay those costs. The FAA determined that the proposed rule will not result in the expenditure of $158,000,000 or more by State, local, or tribal governments, in the aggregate, or the private sector, in any one year.

[3] The EPA also conducted its own analysis and found that manufacturers will comply with the ICAO standards in the absence of U.S. regulations.

[4] The EPA adopted the same emission standard as ICAO; manufacturers would have to comply with the national emission standard of another country, usually based on the ICAO standard, in order to sell its airplanes there.

[5] Small Business Administration (SBA). 2019. Table of Size Standards. Effective August 12, 2019. *https://www.sba.gov/document/support--table-size-standards.*

E. 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 the following proposed new information collection requirement. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has submitted these proposed information collection amendments to OMB for its review.

Summary: The proposed regulations, adding a new part 38 to 14 CFR that requires certification for fuel efficiency, includes a collection of data from certification applicants. Certain data collected by the respondent during its certification flight tests are to be included in a certification test report that is submitted to the FAA. Those data are described in appendix A to part 38. The information in the test report is used by the agency to determine whether the subject airplane complies with the fuel efficiency requirements promulgated by the EPA and the FAA. Without such information, the FAA would not have the complete record of an airplane's fuel efficiency performance and would be unable to issue a type or airworthiness certificate.

Use: Respondent's data will be used to determine compliance with the fuel efficiency standards established by the EPA under the requirements of the Clean Air Act. The FAA is required by the CAA to implement those standards, which is done at the time of aircraft certification.

Respondent's test data will not be maintained by the FAA following a certification determination. The certification test report is not available to the public. The regulation also requires that certain values be listed in the flight manual of the airplane, which is given to the purchaser of an airplane.

Respondents (including number of): The FAA anticipates three respondents to the collection of information.

Frequency: The FAA anticipates that respondents will provide responses annually (averaged).

Annual Burden Estimate: Table 1 provides the FAA's estimates of annual reporting (submittal of certification data) and recordkeeping (manual information) burden.

TABLE 1—SUMMARY OF ANNUAL BURDEN

Category	Reporting	Record-keeping
# of respondents	3	3
# of responses per respondent	2	2
Time per response (hours)	2	8
Total # of responses	5	5
Total burden (hours)	9	36

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 August 15, 2022. 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 20053.

F. International Compatibility and Cooperation Act

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 substantive differences with these proposed regulations.

G. Environmental Analysis

FAA Order 1050.1F identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this rulemaking action qualifies for the categorical exclusion identified in paragraph 5–6.6f for regulations and involves no extraordinary circumstances.

H. DOT Order 2100.6A—Rulemaking and Guidance Procedures

On June 7, 2021, the Department of Transportation issued Order 2100.6A, *Rulemaking & Guidance Procedures,* calling for identification of topics that are ''reasonably anticipated to be related to a major program, policy, or activity of the Department or a high-profile issue pending for decision before the Department; involve one of the Secretary's top policy priorities; or to garner significant press or congressional attention.'' Reducing the impacts of climate change is considered a major policy goal of the current administration. This proposed rule addresses the certification of fuel efficiency for subsonic, civil airplanes and addresses a portion of the role that civil aviation plays in climate change. Airplanes emit CO_2, a greenhouse gas, as they burn fuel. This proposed rule would require the measurement of the fuel efficiency of an airplane as a tool for assessing the continued output of CO_2 from airplanes and informing future standards limiting CO_2 emissions.

IV. Executive Order Determinations

A. Executive Order 13132, Federalism

The FAA has analyzed this proposed rule under the principles and criteria of Executive Order (E.O.) 13132, Federalism. The agency has determined that this action would not have a substantial direct effect on the States, or the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, would not have federalism implications.

B. Executive Order 13211, Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA analyzed this proposed rule under E.O. 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). The agency has determined that it would not be a ''significant energy action'' under the executive order and would not be likely to have a significant adverse effect on the supply, distribution, or use of energy.

C. Executive Order 13609, International Cooperation

Executive Order 13609, Promoting International Regulatory Cooperation

(77 FR 26413, May 4, 2012), promotes international regulatory cooperation to meet shared challenges involving health, safety, labor, security, environmental, and other issues and reduce, eliminate, or prevent unnecessary differences in regulatory requirements. The FAA has analyzed this action under the policy and agency responsibilities of E.O. 13609. The agency has determined that this action would eliminate differences between U.S. aviation standards and those of other civil aviation authorities by adopting the airplane certification regulations needed to comply with the standards adopted by ICAO and the U.S. EPA.

V. Additional Information

A. Comments Invited

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 proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. To ensure the docket does not contain duplicate comments, commenters should send only one copy of written comments, or if comments are filed electronically, commenters should submit only one time.

The FAA will file in the docket all comments it receives, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking. Before acting on this proposal, the FAA will consider all comments it receives on or before the closing date for comments. The FAA will consider comments filed after the comment period has closed if it is possible to do so without incurring expense or delay. The agency may change this proposal in light of the comments it receives.

Confidential Business Information: Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as ''PROPIN.'' The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to the person listed in **FOR FURTHER INFORMATION CONTACT** above. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

B. Availability of Rulemaking Documents

An electronic copy of rulemaking documents may be obtained from the internet by—

1. Searching the Federal eRulemaking Portal at *www.regulations.gov;*

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

3. Accessing the Government Printing Office's web page at *www.govinfo.gov.*

Copies may also be obtained by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue SW, Washington, DC 20591, or by calling (202) 267–9677. Commenters must identify the docket or notice number of this rulemaking.

All documents the FAA considered in developing this proposed rule, including economic analyses and technical reports, may be accessed from the internet through the Federal eRulemaking Portal referenced in item (1) above.

List of Subjects

14 CFR Part 21

Aircraft, Aviation safety, Exports, Imports, Reporting and recordkeeping requirements.

14 CFR Part 38

Air pollution control, Aircraft.

14 CFR Part 121

Air carriers, Aircraft, Airmen, Aviation safety, Charter flights, Reporting and recordkeeping requirements, Safety, Transportation.

14 CFR Part 125

Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements.

In consideration of the foregoing, the Federal Aviation Administration proposes to amend chapter I of title 14, Code of Federal Regulations as follows:

PART 21—CERTIFICATION PROCEDURES FOR PRODUCTS AND ARTICLES

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

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(f), 106(g), 40105, 40113, 44701–44702, 44704, 44707, 44709, 44711, 44713, 44715, 45303.

■ 2. Amend § 21.5 by adding paragraph (b)(3) to read as follows:

§ 21.5 Airplane or Rotorcraft Flight Manual.

* * * * *

(b) * * *

(3) Documentation of compliance with part 38 of this chapter, in an FAA-approved section of any approved airplane flight manual. Such material must include the fuel efficiency metric value as calculated under § 38.11 of this chapter, and the specific paragraph of § 38.17 of this chapter with which compliance has been shown for that airplane.

■ 3. Amend § 21.17 by revising the introductory text of paragraph (a) to read as follows:

§ 21.17 Designation of applicable regulations.

(a) Except as provided in §§ 25.2, 27.2, and 29.2 of this subchapter, and in parts 26, 34, 36, and 38 of this subchapter, an applicant for a type certificate must show that the aircraft, aircraft engine, or propeller concerned meets—

* * * * *

■ 4. Amend § 21.29 by revising paragraphs (a)(1)(i) and (b) to read as follows:

§ 21.29 Issue of type certificate: import products.

(a) * * *

(1) * * *

(i) The applicable aircraft noise, fuel venting and exhaust emissions, and fuel efficiency requirements of this subchapter as designated in § 21.17, or the applicable aircraft noise, fuel venting and exhaust emissions, and fuel efficiency requirements of the State of Design, and any other requirements the FAA may prescribe to provide noise, fuel venting and exhaust emission, and fuel efficiency levels no greater than those provided by the applicable aircraft noise, fuel venting and exhaust emissions, and fuel efficiency requirements of this subchapter as designated in § 21.17; and

* * * * *

(b) A product type certificated under this section is determined to be compliant with the fuel venting and

exhaust emission standards of part 34 of this subchapter, the noise standards of part 36 of this subchapter, and the fuel efficiency requirements of part 38 of this subchapter. Compliance with parts 34, 36, and 38 of this subchapter is certified under paragraph (a)(1)(i) of this section, and the applicable airworthiness standards of this subchapter, or an equivalent level of safety, with which compliance is certified under paragraph (a)(1)(ii) of this section.

■ 5. Amend § 21.31 by revising paragraph (e) to read as follows:

§ 21.31 Type design.

* * * * *

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

■ 6. Amend § 21.93 by adding paragraph (d) to read as follows:

§ 21.93 Classification of changes in type design.

* * * * *

(d) For the purpose of maintaining compliance with part 38 of this chapter, any voluntary change in the type design of an airplane that may increase the fuel efficiency metric value of that airplane is a ''fuel efficiency change'', in addition to being a minor or major change as classified in paragraph (a) of this section.

■ 7. Amend § 21.101 by revising paragraph (a) to read as follows:

§ 21.101 Designation of applicable regulations.

(a) An applicant for a change to a type certificate must show that the change and areas affected by the change comply with the airworthiness requirements applicable to the category of the product in effect on the date of the application for the change and with parts 34, 36, and 38 of this chapter. Exceptions are detailed in paragraphs (b) and (c) of this section.

* * * * *

■ 8. Amend § 21.115 by revising paragraph (a) to read as follows:

§ 21.115 Applicable requirements.

(a) Each applicant for a supplemental type certificate must show that the altered product meets applicable requirements specified in § 21.101 and—

(1) In the case of an acoustical change described in § 21.93(b), show compliance with the applicable noise requirements of part 36 of this chapter;

(2) 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 of this chapter; and

(3) In the case of a fuel efficiency change described in § 21.93(d), show compliance with the applicable fuel efficiency requirements of part 38 of this chapter.

* * * * *

■ 9. Amend § 21.183 by adding reserved paragraph (i) and paragraph (j) 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.

* * * * *

(j) *Fuel efficiency requirements.* No original standard airworthiness certificate may be issued under this section unless the applicant has demonstrated that the type design complies with the applicable fuel efficiency requirements of part 38 of this chapter.

■ 10. Amend § 21.187 by revising paragraph (a) to read as follows:

§ 21.187 Issue of multiple airworthiness certification.

(a) An applicant for an airworthiness certificate in the restricted category, and in one or more other categories except primary category, is entitled to the certificate, if—

(1) He shows compliance with the requirements for each category, when the aircraft is in the configuration for that category;

(2) He shows that the aircraft can be converted from one category to another by removing or adding equipment by simple mechanical means;

(3) The aircraft complies with the applicable requirements of part 34 of this subchapter; and

(4) The airplane complies with the applicable requirements of part 38 of this subchapter.

* * * * *

■ 11. Add part 38 to read as follows:

PART 38—AIRPLANE FUEL EFFICIENCY CERTIFICATION

Subpart A—General

Subpart B—Determining Fuel Efficiency for Subsonic Airplanes

Authority: 42 U.S.C. 4321 *et seq.,* 7572; 49 U.S.C. 106(g), 40113, 44701–44702, 44704; 49 CFR 1.83(c).

Subpart A—General

§ 38.1 Applicability.

(a) Except as provided in paragraph (c) of this section, an airplane that is subject to the requirements of 40 CFR part 1030 may not exceed the fuel efficiency limits of this part when original type certification under this title is sought. This part applies to the following airplanes:

(1) A subsonic jet airplane that has—

(i) A type-certificated maximum passenger seating capacity of 20 seats or more, and

(ii) A maximum takeoff mass (MTOM) greater than 5,700 kg, and

(iii) An application for original type certification that is submitted on or after January 11, 2021, or

(iv) A type-certificated maximum passenger seating capacity of 19 seats or fewer, and

(v) A MTOM greater than 60,000 kg, and

(vi) An application for original type certification that is submitted on or after January 11, 2021.

(2) A subsonic jet airplane that has—

(i) A type-certificated maximum passenger seating capacity of 19 seats or fewer,

(ii) A MTOM greater than 5,700 kg, but not greater than 60,000 kg, and

(iii) An application for original type certification that is submitted on or after January 1, 2023.

(3) A propeller-driven airplane that has—

(i) A MTOM greater than 8,618 kg, and

(ii) An application for original type certification that is submitted on or after January 11, 2021.

(4) A subsonic jet airplane—

(i) That is a modified version of an airplane whose type design was not certificated under this part,

(ii) That has a MTOM greater than 5,700 kg,

(iii) For which an application for the modification in type design is submitted on or after January 1, 2023, and

(iv) For which the first certificate of airworthiness is issued for an airplane built with the modified type design.

(5) A propeller-driven airplane—

(i) That is a modified version of an airplane whose type design was not certificated under this part,

(ii) That has a MTOM greater than 8,618 kg,

(iii) For which an application for modification in type design is submitted on or after January 1, 2023, and

(iv) For which the first certificate of airworthiness is issued for an airplane built with the modified type design.

(6) A subsonic jet airplane that has—

(i) A MTOM greater than 5,700 kg, and

(ii) Its first certificate of airworthiness issued on or after January 1, 2028.

(7) A propeller-driven airplane that has—

(i) A MTOM greater than 8,618 kg, and

(ii) Its first certificate of airworthiness issued on or after January 1, 2028.

(b) The requirements of this part apply to an airplane that incorporates a modification that changes the fuel efficiency metric value of a prior version of that airplane. A modified airplane may not exceed the applicable fuel efficiency limit of this part when certification under this chapter is sought. The criteria for modified airplanes are described in § 38.19. A modified airplane is subject to the same fuel efficiency limit of § 38.17 as the prior version of the airplane.

(c) The requirements of this part do not apply to:

(1) Subsonic jet airplanes having a MTOM at or below 5,700 kg.

(2) Propeller-driven airplanes having a MTOM at or below 8,618 kg.

(3) Amphibious airplanes.

(4) Airplanes initially designed, or modified and used, for specialized operations. These airplane designs may include characteristics or configurations necessary to conduct specialized operations that the United States Environmental Protection Agency (EPA) and the FAA have determined may cause a significant increase in the fuel efficiency metric value.

(5) Airplanes designed with a reference geometric factor of zero.

(6) Airplanes designed for, or modified and used for, firefighting.

(7) Airplanes powered by reciprocating engines.

§ 38.3 Definitions.

For the purpose of showing compliance with this part, the following terms have the specified meanings:

Amphibious airplane means an airplane that is capable of takeoff and landing on both land and water. Such an airplane uses its hull or floats attached to the landing gear for takeoff and landing on water, and either extendable or fixed landing gear for takeoff and landing on land.

ICAO Annex 16, Volume III means Volume III of Annex 16 to the Convention on International Civil Aviation.

Maximum takeoff mass (MTOM) is the maximum allowable takeoff mass as stated in the approved certification basis for an airplane type design. Maximum takeoff mass is expressed in kilograms.

Performance model is an analytical tool (or a method) validated using corrected flight test data that can be used to determine the specific air range values for calculating the fuel efficiency metric value.

Reference geometric factor (RGF) is a non-dimensional number derived from a two-dimensional projection of the fuselage.

Specific air range (SAR) is the distance an airplane travels per unit of fuel consumed. Specific air range is expressed in kilometers per kilogram of fuel.

Subsonic means an airplane that has not been certificated under this title to exceed Mach 1 in normal operation.

Type certificated maximum passenger seating capacity means the maximum number of passenger seats that may be installed on an airplane as listed on its type certificate data sheet, regardless of the actual number of seats installed on an individual airplane.

§ 38.4 Compatibility with airworthiness requirements.

Unless otherwise approved by the FAA, an airplane used to demonstrate compliance with this part must meet all of the airworthiness requirements of this chapter required to establish the type certification basis of the airplane, for any condition under which compliance with this part is being demonstrated. Any procedure used to demonstrate compliance, and any flight crew information developed for demonstrating compliance with this part, must be consistent with the airworthiness requirements of this chapter that constitute the type certification basis of the airplane.

§ 38.5 Exemptions.

A petition for exemption from any requirement of this part must be submitted to the Administrator in accordance with and meet the requirements of part 11 of this chapter. The FAA will consult with the EPA on each exemption petition before taking action.

§ 38.7 [Reserved]

§ 38.9 Relationship to other regulations.

In accordance with certain provision of the Clean Air Act Amendments of 1970 (CAA) (42 U.S.C. 7571 *et seq.*), the United States Environmental Protection Agency (EPA) is authorized to set standards for aircraft engine emissions in the United States, while the FAA is authorized to insure compliance with those standards under a delegation from the Secretary of Transportation (49 CFR 1.47). The fuel efficiency limits in § 38.17 are intended to be the same as that promulgated by the EPA in 40 CFR part 1030. Accordingly, if the EPA changes any regulation in 40 CFR part 1030 that corresponds with a regulation in this part, a certification applicant may request a waiver of those provisions as they appear in this part in order to comply with part 1030. In addition, unless otherwise specified in this part, all terminology and abbreviations in this part that are defined in 40 CFR part 1030 have the meaning specified in part 1030.

Subpart B—Determining Fuel Efficiency for Subsonic Airplanes

§ 38.11 Fuel efficiency metric.

For each airplane subject to this part, or to determine whether a modification makes an airplane subject to this part under the change criteria of § 38.19, a fuel efficiency metric value must be calculated, using the following equation, rounded to three decimal places:

$$Fuel\ Efficiency\ \text{metric value} = \frac{\left(\frac{1}{SAR}\right)_{avg}}{RGF^{0.24}}$$

Where:

The SAR is determined in accordance with § 38.13, and the RGF is determined in accordance with § 38.15. The fuel efficiency metric value is expressed in units of kilograms of fuel consumed per kilometer.

§ 38.13 Specific air range.

(a) For each airplane subject to this part, the SAR of an airplane must be determined by either:

(1) Direct flight test measurements.

(2) Using a performance model that is:

(i) Validated by actual SAR flight test data; and

(ii) Approved by the FAA before any SAR calculations are made.

(b) For the airplane model, establish a 1/SAR value at each of the following reference airplane masses:

(1) High gross mass: 92 percent MTOM.

(2) Low gross mass: (0.45 * MTOM) + (0.63 * (MTOM^0.924)).

(3) Mid gross mass: simple arithmetic average of high gross mass and low gross mass.

(c) To obtain $(1/SAR)_{avg}$ as required to determine the fuel efficiency metric value described in § 38.11, calculate the average of the three 1/SAR values described in paragraph (b) of this section. Do not include auxiliary power units in any 1/SAR calculation.

(d) All determinations made under this section must be made in accordance with the procedures applicable to SAR as described in appendix A to this part.

§ 38.15 Reference geometric factor.

For each airplane subject to this part, determine the airplane's non-dimensional RGF for the fuselage size of each airplane model, calculated as follows:

(a) For an airplane with a single deck, determine the area of a surface (expressed in m^2) bounded by the maximum width of the fuselage outer mold line projected to a flat plane parallel with the main deck floor and the forward and aft pressure bulkheads except for the crew cockpit zone.

(b) For an airplane with more than one deck, determine the sum of the areas (expressed in m^2) as follows:

(1) The maximum width of the fuselage outer mold line, projected to a flat plane parallel with the main deck floor by the forward and aft pressure bulkheads except for any crew cockpit zone.

(2) The maximum width of the fuselage outer mold line at or above each other deck floor, projected to a flat plane parallel with the additional deck floor by the forward and aft pressure bulkheads except for any crew cockpit zone.

(c) Determine the non-dimensional RGF by dividing the area defined in paragraph (a) or (b) of this section by 1 m^2.

(d) All measurements and calculations used to determine the RGF of an airplane must be made in accordance with the procedures for determining RGF in section A38.3 of appendix A to this part.

§ 38.17 Fuel efficiency limits.

(a) The fuel efficiency limits in this section are expressed as maximum permitted fuel efficiency metric values, as calculated under § 38.11.

(b) The fuel efficiency metric value of an airplane subject to this part may not exceed the following, rounded to three decimal places:

For airplanes described in . . .	With a MTOM . . .	The maximum permitted fuel efficiency metric value is . . .
(1) Section 38.1(a)(1) and (2)	5,700 < MTOM ≤ 60,000 kg	$10^{(-2.73780+(0.681310*\log_{10}(MTOM))+(-0.0277861*(\log_{10}(MTOM))\wedge 2))}$.
(2) Section 38.1(a)(3)	8,618 < MTOM ≤ 60,000 kg	$10^{(-2.73780+(0.681310*\log_{10}(MTOM))+(-0.0277861*(\log_{10}(MTOM))\wedge 2))}$.
(3) Section 38.1(a)(1) and (3)	60,000 < MTOM ≤ 70,395 kg	0.764.
(4) Section 38.1(a)(1) and (3)	MTOM > 70,395 kg	$10^{(-1.412742+(-0.020517*\log_{10}(MTOM))+(0.0593831*(\log_{10}(MTOM))\wedge 2))}$.
(5) Section 38.1(a)(4) and (6)	5,700 < MTOM ≤ 60,000 kg	$10^{(-2.57535+(0.609766*\log_{10}(MTOM))+(-0.0191302*(\log_{10}(MTOM))\wedge 2))}$.
(6) Section 38.1(a)(5) and (7)	8,618 < MTOM ≤ 60,000 kg	$10^{(-2.57535+(0.609766*\log_{10}(MTOM))+(-0.0191302*(\log_{10}(MTOM))\wedge 2))}$.
(7) Section 38.1(a)(4) through (7)	60,000 < MTOM ≤ 70,107 kg	0.797.
(8) Section 38.1(a)(4) through (7)	MTOM > 70,107 kg	$10^{(-1.39353+(-0.020517*\log_{10}(MTOM))+(0.0593831*(\log_{10}(MTOM))\wedge 2))}$.

§ 38.19 Change criteria.

(a) For an airplane that has been shown to comply with § 38.17, any subsequent version of that airplane must demonstrate compliance with § 38.17 if the subsequent version incorporates a modification that either increases:

(1) The maximum takeoff mass; or

(2) The fuel efficiency metric value by more than:

(i) For airplanes with a MTOM greater than or equal to 5,700 kg, the value decreases linearly from 1.35 to 0.75 percent for an airplane with a MTOM of 60,000 kg.

(ii) For airplanes with a MTOM greater than or equal to 60,000 kg, the value decreases linearly from 0.75 to 0.70 percent for airplanes with a MTOM of 600,000 kg.

(iii) For airplanes with a MTOM greater than or equal to 600,000 kg, the value is 0.70 percent.

(b) For an airplane that has been shown to comply with § 38.17, and for any subsequent version of that airplane that incorporates modifications that do not increase the MTOM or the fuel efficiency metric value in excess of the levels shown in this paragraph (b), the fuel efficiency metric value of the modified airplane may be reported to be the same as the value of the prior version.

(c) For an airplane that meets the criteria of § 38.1(a)(4) or (5), on or after January 1, 2023, and before January 1, 2028, the airplane must demonstrate compliance with § 38.17 if it incorporates any modification that increases the fuel efficiency metric value by more than 1.5 percent from the prior version of the airplane.

§ 38.21 Approval before compliance testing.

All procedures, weights, configurations, and other information or data that are used to establish a fuel efficiency level required by this part or in any appendix to this part (including any equivalent procedures) must be approved by the FAA prior to use in certification tests intended to demonstrate compliance with this part.

§ 38.23 Manual information and limitations.

(a) *Information in manuals.* The following information must be included in any FAA-approved section of a FAA-approved Airplane Flight Manual or combination of approved manual material:

(1) Fuel efficiency level established during type certification; and

(2) Maximum takeoff mass at which fuel efficiency level was established.

(b) *Limitation.* If the fuel efficiency of an airplane is established at a weight (mass) that is less than the maximum certificated takeoff weight (mass) used to establish the airworthiness of the airplane under this chapter, the lower weight (mass) becomes an operating limitation of the airplane and that limitation must be included in the limitations section of any FAA-approved manual.

Appendix A to Part 38—Determination of Airplane Fuel Efficiency Metric Value

Sec.

A38.1 Introduction

A38.1 Introduction

A38.1.1 This appendix describes the processes and procedures for determining the fuel efficiency metric value for an airplane subject to this part.

A38.1.2 Methods for Determining Specific Air Range (SAR)

A38.1.2.1 SAR may be determined by either—

A38.1.2.1.1 Direct flight test measurement at the SAR test points, including any corrections of test data to reference specifications; or

A38.1.2.1.2 Use of a performance model.

A38.1.2.2 For any determination made under section A38.1.2.1.1 of this appendix, the SAR flight test data must have been acquired in accordance with the procedures defined in this appendix and approved by the FAA.

A38.1.2.3 For any determination made under section A38.1.2.1.2 of this appendix, the performance model must:

A38.1.2.3.1 Be verified that the model produces the values that are the same as FAA-approved SAR flight test data.

A38.1.2.3.2 Include a detailed description of any test and analysis method and any algorithm used so as to allow evaluation by the FAA; and

A38.1.2.3.4 Be approved by the FAA before use.

A38.2 Reference Specifications for SAR Flight Tests

A38.2.1 The following reference specifications must be established when determining SAR values for an airplane. No reference specification may exceed any airworthiness limit approved for the airplane under this chapter. See section A38.5 of this appendix for further information.

A38.2.1.1 Reference specifications at the airplane level:

A38.2.1.1.1 Airplane at the reference masses listed in § 38.13(b);

A38.2.1.1.2 A combination of altitude and airspeed selected by the applicant;

A38.2.1.1.3 Airplane in steady, unaccelerating, straight and level flight;

A38.2.1.1.4 Airplane in longitudinal and lateral trim;

A38.2.1.1.5 Airplane gravitational acceleration when travelling in the direction of true North in still air at the reference altitude and a geodetic latitude of 45.5 degrees, based on g_0 (g_0 is 9.80665 m/s^2, which is the standard acceleration due to gravity at sea level and a geodetic latitude of 45.5 degrees);

A38.2.1.1.6 A reference airplane center of gravity (CG) position selected by the applicant to be representative of a mid-CG point relevant to design cruise performance at each of the three reference airplane masses; and

A38.2.1.1.7 A wing structural loading condition defined by the applicant that is representative of operations conducted in accordance with the airplane's maximum payload capability.

A38.2.1.2 Reference specifications at the engine level:

A38.2.1.2.1 Electrical and mechanical power extraction and bleed flow relevant to design cruise performance, as selected by the applicant;

Note.—Power extraction and bleed flow attributable to the use of optional equipment such as passenger entertainment systems need not be included.

A38.2.1.2.2 Engine stability bleeds operating according to the manufacturer's normal schedule for the engine; and

A38.2.1.2.3 Engines with at least 15 cycles or 50 engine flight hours.

A38.2.1.3 Other reference specifications:

A38.2.1.3.1 ICAO standard day atmosphere (Doc 7488/3, 3rd edition 1993, titled ''Manual of the ICAO Standard Atmosphere (extended to 80 kilometres (262 500 feet))'')

A38.2.1.3.2 Fuel lower heating value equal to 43.217 MJ/kg (18 580 BTU/lb);

A38.2.2 If any test conditions are not the same as the reference specifications of this appendix, the test conditions must be corrected to the reference specifications as described in section A38.5 of this appendix.

A38.3 Determination of Reference Geometric Factor (RGF)

A38.3.1 This section provides additional information for determining the RGF, as required by § 38.15.

A38.3.2 The area that defines RGF includes all pressurized space on a single or multiple decks including aisles, assist spaces, passageways, stairwells and areas that can accommodate cargo or auxiliary fuel containers. It does not include permanent integrated fuel tanks within the cabin, or any unpressurized fairings, crew rest or work areas, or cargo areas that are not on the main or upper deck (*e.g.,* 'loft' or under floor areas). RGF does not include the cockpit crew zone.

A38.3.3 The aft boundary to be used for calculating RGF is the aft pressure bulkhead. The forward boundary is the forward pressure bulkhead, not including the cockpit crew zone.

A38.3.4 Areas that are accessible to both crew and passengers are not considered part of the cockpit crew zone. For an airplane that has a cockpit door, the aft boundary of the cockpit crew zone is the plane of the cockpit door. For an airplane that has no cockpit door, or has optional interior configurations that include different locations of the cockpit door, the aft boundary is determined by the configuration that provides the smallest available cockpit crew zone. For airplanes certificated for single-pilot operation, the cockpit crew zone is measured as half the width of the cockpit.

A38.3.5 Figures A38–1 and A38–2 of this appendix provide a notional view of the RGF boundary conditions.

BILLING CODE 4910–13–P

Figure A38-1 to Appendix A to Part 38. Cross-sectional view

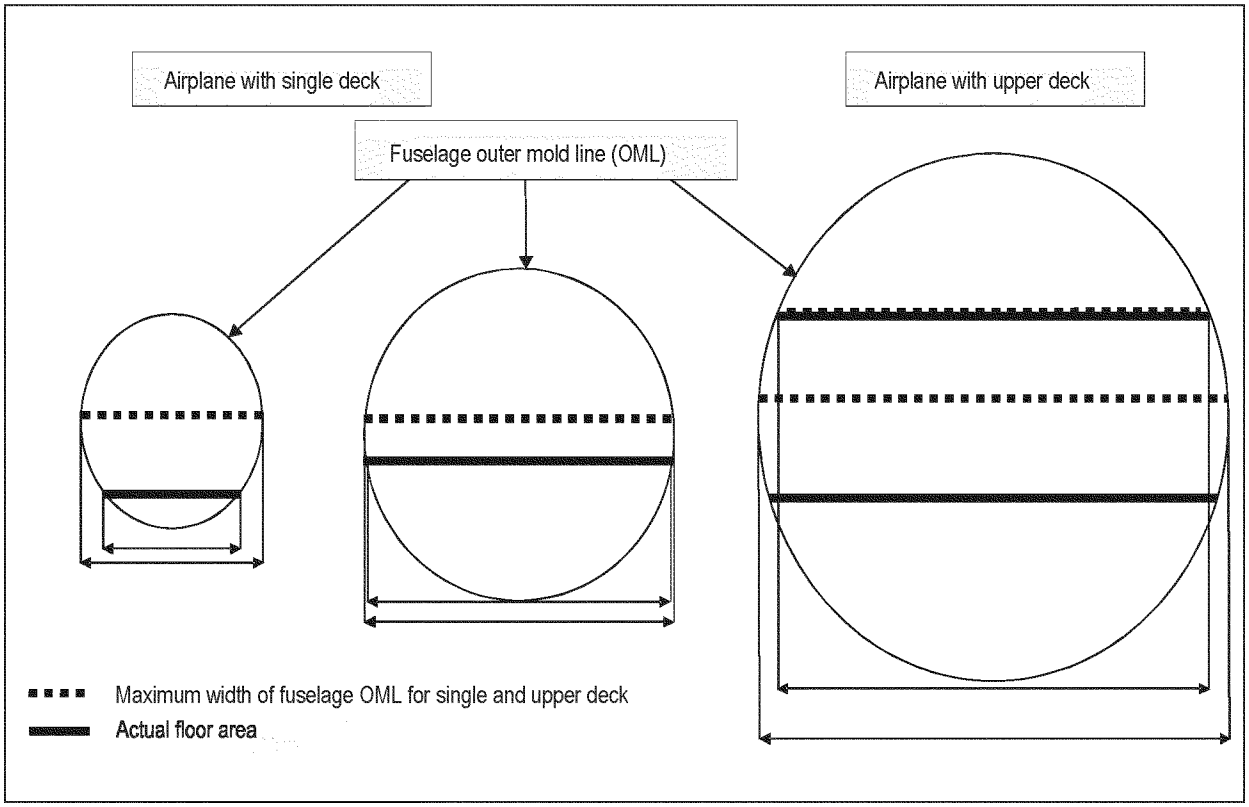
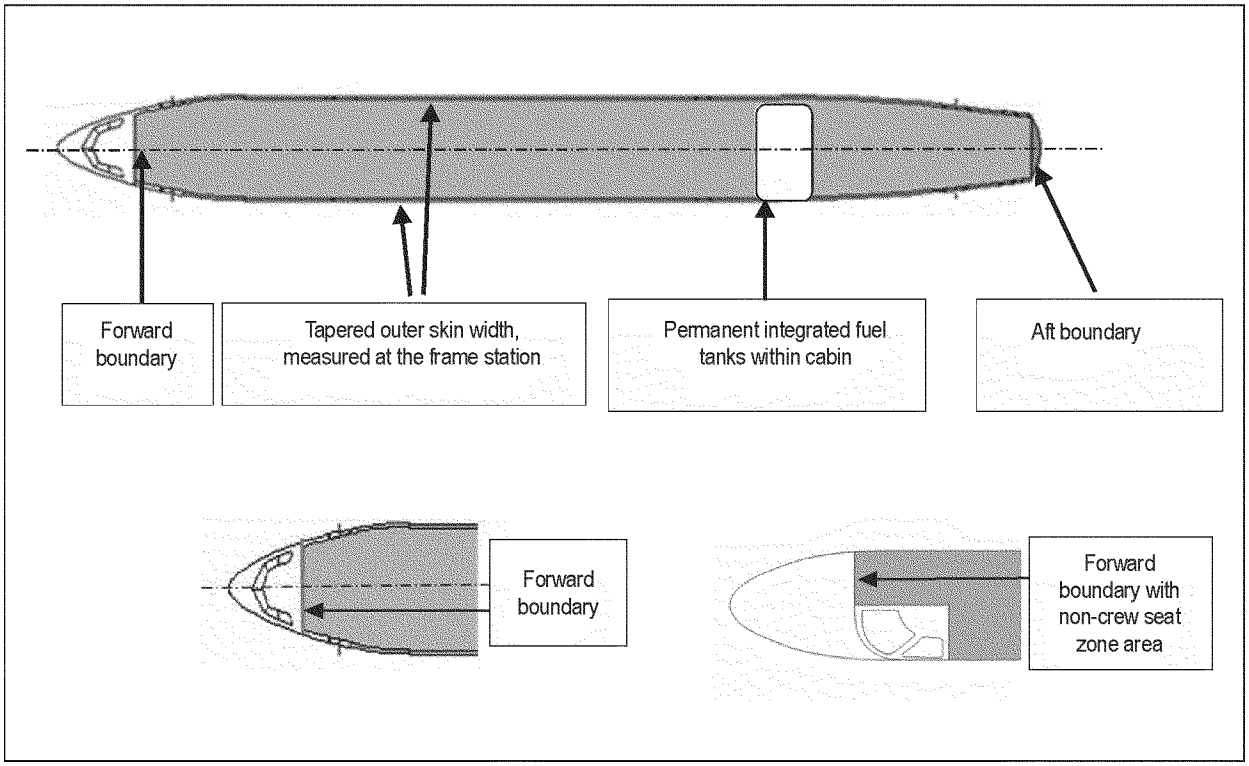


Figure A38-2 to Appendix A to Part 38. Longitudinal view



BILLING CODE 4910–13–C

A38.4 Certification Test Specifications

A38.4.1 Certification Test Specifications. This section prescribes the specifications under which an applicant must conduct SAR certification tests.

A38.4.2 Flight Test Procedures

A38.4.2.1 Before a Test Flight. The test flight procedures must include the following elements and must be approved by the FAA before any test flight is conducted:

A38.4.2.1.1 *Airplane conformity.* The test airplane must conform to the critical configuration of the type design for which certification is sought.

A38.4.2.1.2 *Airplane weight.* The weight and balance of the test airplane must be established prior to the test flight, including any changes in weight that occur after the airplane is weighed and before the flight is conducted.

A38.4.2.1.3 *Fuel.* The fuel used for each flight test must meet the specification defined in either ASTM D1655–15 (entitled ''Standard Specification for Aviation Turbine Fuels''), Defense Standard 91–91, Issue 7, Amendment 3 (entitled ''Turbine Fuel, Kerosene Type, Jet A–1''), or as approved by FAA.

A38.4.2.1.4 *Fuel lower heating value.* The lower heating value of the fuel used on a test flight must be determined from a sample of fuel used for the test flight. The lower heating value of the fuel sample must be used to correct measured data to reference specifications. The determination of lower heating value and the correction to reference specifications are subject to approval by the FAA.

A38.4.2.1.4.1 The fuel lower heating value may be determined in accordance with ASTM specification D4809–13 ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter (Precision Method)'', or as approved by the FAA.

A38.4.2.1.4.2 The fuel sample may be representative of the fuel used for each flight test and may not have variations.

A38.4.2.1.5 *Fuel specific gravity and viscosity.* When volumetric fuel flow meters are used, the specific gravity and viscosity of the fuel used on a test flight must be determined from a sample of fuel used for the test flight.

A38.4.2.1.5.1 The fuel specific gravity may be determined in accordance with ASTM specification D4052–11 ''Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter'', or as approved by FAA.

A38.4.2.1.5.2 The fuel kinematic viscosity may be determined in accordance with ASTM specification D445–15 (entitled ''Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)''), or as approved by FAA.

A38.4.2.2 Flight Test Configurations and Test Condition Stability. An applicant must conduct each flight test in accordance with the flight test configurations and the stability conditions as follows:

A38.4.2.2.1 Flight Test Configuration. The following configurations must be maintained during each flight used to gather data for determining SAR values:

A38.4.2.2.1.1 To the extent that is practicable, the airplane is flown at constant pressure altitude and constant heading along isobars;

A38.4.2.2.1.2 The engine thrust/power setting is stable for unaccelerating level flight;

A38.4.2.2.1.3 The airplane is flown as close as practicable to the reference specifications to minimize the magnitude of any correction;

A38.4.2.2.1.4 There are no changes in trim or engine power/thrust settings, engine stability and handling bleeds, or electrical and mechanical power extraction (including bleed flow); and

A38.4.2.2.1.5 There is no unnecessary movement of on-board personnel.

A38.4.2.2.2 Test Condition Stability. To obtain a valid SAR measurement, the following conditions must be maintained during each test flight, including the indicated tolerances for at least 1 minute while SAR data is acquired:

A38.4.2.2.2.1 Mach number within ±0.005;

A38.4.2.2.2.2 Ambient temperature within ±1 °C;

A38.4.2.2.2.3 Heading within ±3 degrees;

A38.4.2.2.2.4 Track within ±3 degrees;

A38.4.2.2.2.5 Drift angle less than 3 degrees;

A38.4.2.2.2.6 Ground speed within ±3.7 km/h (±2 kt);

A38.4.2.2.2.7 Difference in ground speed at the beginning of the SAR measurement from the ground speed at the end of the SAR measurement within ±2.8 km/h/min (±1.5 kt/min); and

A38.4.2.2.2.8 Pressure altitude within ±23 m (±75 ft).

A38.4.2.2.3 Alternatives to the stable test condition criteria of section A38.4.2.2.2 of this appendix may be used provided that stability is sufficiently demonstrated to the FAA.

A38.4.2.2.4 Data obtained at test points that do not meet the stability criteria of section A38.4.2.2.2 may be acceptable as an equivalent procedure, subject to FAA approval.

A38.4.2.2.5 SAR measurements at the test points must be separated by either:

A38.4.2.2.5.1 Two minutes; or

A38.4.2.2.5.2 An exceedance of one or more of the stability criteria limits described in A38.4.2.2.2.

A38.4.2.3 Verification of Airplane Mass at Test Conditions

A38.4.2.3.1 The procedure for determining the mass of the airplane at each test condition must be approved by the FAA.

A38.4.2.3.2 The mass of the airplane during a flight test is determined by subtracting the fuel used from the mass of the airplane at the start of the test flight. The accuracy of the determination of the fuel used must be verified by:

A38.4.2.3.2.1 Weighing the test airplane on calibrated scales before and after the SAR test flight; or

A38.4.2.3.2.2 Weighing the test airplane before and after another test flight that included a cruise segment, provided that flight occurs within one week or 50 flight hours (at the option of the applicant) of the SAR test flight and using the same, unaltered fuel flow meters.

A38.5 Measurement of Specific Air Range

A38.5.1 Measurement System

A38.5.1.1 The following parameters must be recorded at a minimum sampling rate of 1 Hertz (cycle per second):

A38.5.1.1.1 Airspeed;

A38.5.1.1.2 Ground speed;

A38.5.1.1.3 True airspeed;

A38.5.1.1.4 Fuel flow;

A38.5.1.1.5 Engine power setting;

A38.5.1.1.6 Pressure altitude;

A38.5.1.1.7 Temperature;

A38.5.1.1.8 Heading;

A38.5.1.1.9 Track; and

A38.5.1.1.10 Fuel used (for the determination of gross mass and CG position).

A38.5.1.2 The following parameters must be recorded:

A38.5.1.2.1 Latitude;

A38.5.1.2.2 Engine bleed positions and power off-takes; and

A38.5.1.2.3 Power extraction (electrical and mechanical load).

A38.5.1.3 The value of each parameter used for the determination of SAR (except for ground speed) is the simple arithmetic average of the measured values for that parameter obtained throughout the stable test condition described in section A38.4.2.2.2 of this appendix.

A38.5.1.4 For ground speed, the value is the rate of change of ground speed during the SAR test measurement. The rate of change of ground speed during the SAR measurement must be used to evaluate and correct any acceleration or deceleration that might occur during the SAR measurement.

A38.5.1.5 Each measurement device must have sufficient resolution to determine that the stability of a parameter defined in section A38.4.2.2.2 of this appendix is maintained during SAR measurement.

A38.5.1.6 The SAR measurement system consists of the combined instruments and devices, and any associated procedures, used to acquire the following parameters necessary to determine SAR:

A38.5.1.6.1 Fuel flow;

A38.5.1.6.2 Mach number;

A38.5.1.6.3 Altitude;

A38.5.1.6.4 Airplane mass;

A38.5.1.6.5 Ground speed;

A38.5.1.6.6 Outside air temperature;

A38.5.1.6.7 Fuel lower heating value; and

A38.5.1.6.8 CG.

A38.5.1.7 The SAR value is affected by the accuracy of each element that comprises the SAR measurement system. The cumulative error associated with the SAR measurement system is defined as the root sum of squares (RSS) of the individual accuracies.

A38.5.1.8 If the absolute value of the cumulative error of the overall SAR measurement system is greater than 1.5 percent, a penalty equal to the amount that the RSS value exceeds 1.5 percent must be applied to the SAR value that has been corrected to reference specifications (see

section A38.5.2 of this appendix). If the absolute value of the cumulative error of the overall SAR measurement system is less than or equal to 1.5 percent, no penalty will be applied.

A38.5.2 Calculation of Specific Air Range from Measured Data

A38.5.2.1 Calculating SAR. SAR must be calculated using the following equation: SAR = TAS/W_f where TAS is the true airspeed and W_f is total airplane fuel flow.

A38.5.2.2 Correcting Measured SAR Values to Reference Specifications

A38.5.2.2.1 The measured SAR values must be corrected to the reference specifications listed in A38.2 of this appendix. Unless otherwise approved by the FAA, corrections to reference specifications must be applied for each of the following measured parameters:

A38.5.2.2.1.1 *Acceleration/deceleration (energy).* Drag determination is based on an assumption of steady, unaccelerating flight. Acceleration or deceleration occurring during a test condition affects the assessed drag level. The reference specification is in section A38.2.1.1.3 of this appendix.

A38.5.2.2.1.2 *Aeroelastics.* Wing aeroelasticity may cause a variation in drag as a function of airplane wing mass distribution. Airplane wing mass distribution will be affected by the fuel load distribution in the wings and the presence of any external stores. The reference specification is in section A38.2.1.1.7 of this appendix.

A38.5.2.2.1.3 *Altitude.* The altitude at which the airplane is flown affects the fuel flow. The reference specification is in section A38.2.1.1.2 of this appendix.

A38.5.2.2.1.4 *Apparent gravity.* Acceleration, caused by the local effect of gravity, and inertia, affect the test weight of the airplane. The apparent gravity at the test conditions varies with latitude, altitude, ground speed, and direction of motion relative to the Earth's axis. The reference gravitational acceleration is the gravitational acceleration for the airplane travelling in the direction of true North in still air at the reference altitude, a geodetic latitude of 45.5 degrees, and based on g_0 (see section A38.2.1.1.5 of this appendix).

A38.5.2.2.1.5 *CG position.* The position of the airplane CG affects the drag due to longitudinal trim. The reference specification is in section A38.2.1.1.6 of this appendix.

A38.5.2.2.1.6 *Electrical and mechanical power extraction and bleed flow.* Electrical and mechanical power extraction, and bleed flow affect the fuel flow. The reference specifications are in sections A38.2.1.2.1 and A38.2.1.2.2 of this appendix.

A38.5.2.2.1.7 *Engine deterioration level.* The requirement in section A38.2.1.2.3 of this appendix addresses the minimum deterioration of an engine that is used to determine SAR. Since engine deterioration is rapid when an engine is new, when used for SAR determination:

A38.5.2.2.1.7.1 Subject to FAA approval, an engine having less deterioration than the reference deterioration level in section A38.2.1.2.3 of this appendix must correct the fuel flow to the reference deterioration using an approved method.

A38.5.2.2.1.7.2 An engine with greater deterioration than the reference deterioration level in section A38.2.1.2.3 of this appendix may be used, and no correction is permitted.

A38.5.2.2.1.8 *Fuel lower heating value.* The fuel lower heating value defines the energy content of the fuel. The lower heating value directly affects the fuel flow at a given test condition. The reference specification is in section A38.2.1.3.2 of this appendix.

A38.5.2.2.1.9 *Reynolds number.* The Reynolds number affects airplane drag. For a given test condition the Reynolds number is a function of the density and viscosity of air at the test altitude and temperature. The reference Reynolds number is derived from the density and viscosity of air from the ICAO standard atmosphere at the reference altitude (see sections A38.2.1.1.2 and A38.2.1.3.1 of this appendix).

A38.5.2.2.1.10 *Temperature.* The ambient temperature affects the fuel flow. The reference temperature is the standard day temperature from the ICAO standard atmosphere at the reference altitude (see section A38.2.1.3.1 of this appendix).

Note.—Post-flight data analysis includes the correction of measured data for data acquisition hardware response characteristics (*e.g.* system latency, lag, offset, buffering, etc.).

A38.5.2.2.2 Correction methods are subject to the approval of the FAA.

A38.5.2.3 Using Specific Air Range to Determine the Fuel Efficiency Metric Value

A38.5.2.3.1 Calculate the SAR values for each of the three reference masses as described in § 38.13, including any corrections to reference specifications, as required under this part. The final SAR value for each reference mass is the simple arithmetic average of all valid test points at the appropriate gross mass, or derived from a validated performance model. No data acquired from a valid test point may be omitted unless approved by the FAA.

A38.5.2.3.2 When an FAA-approved performance model is used, extrapolations to aircraft masses other than those tested may be approved when such extrapolations are consistent with accepted airworthiness practices. Since a performance model must be based on data covering an adequate range of lift coefficient, Mach number, and thrust specific fuel consumption, no extrapolation of those parameters is permitted.

A38.5.3 Validity of Results

A38.5.3.1 A 90 percent confidence interval must be calculated for each of the SAR values at the three reference masses.

A38.5.3.2 If the 90 percent confidence interval of the SAR value at any of the three reference airplane masses—

A38.5.3.2.1 Is less than or equal to ±1.5 percent, the SAR value may be used.

A38.5.3.2.2 Exceeds ±1.5 percent, a penalty equal to the amount that the 90 percent confidence interval exceeds ±1.5 percent must be applied to the SAR value, as approved by the FAA.

A38.5.3.3 If clustered data is acquired separately for each of the three gross mass reference points, the minimum sample size acceptable for each of the three gross mass SAR values is six.

A38.5.3.4 If SAR data is collected over a range of masses, the minimum sample size is 12 and the 90 percent confidence interval is calculated for the mean regression line through the data.

A38.6 Submission of Certification Data to the FAA

The following information must be provided to the FAA in the certification test report for each airplane type and model for which fuel efficiency certification under this part is sought.

A38.6.1 General Information

A38.6.1.1 Designation of the airplane type and model:

A38.6.1.2 Configuration of the airplane as required in § 38.23(a)(3), including CG range, number and type designation of engines and, if fitted, propellers, and any modifications or non-standard equipment expected to affect the fuel efficiency characteristics;

A38.6.1.3 MTOM used for certification under this part;

A38.6.1.4 All dimensions needed for calculation of RGF; and

A38.6.1.5 Serial number of each airplane used to establish fuel efficiency certification in accordance with this part.

A38.6.2 Reference Specifications. The reference specifications used to determine any SAR value as described in section A38.2 of this appendix.

A38.6.3 Test Data. The following measured test data, including any corrections for instrumentation characteristics, must be provided for each of the test measurement points used to calculate the SAR values for each of the reference masses defined in § 38.13(b):

A38.6.3.1 Airspeed, ground speed and true airspeed;

A38.6.3.2 Fuel flow;

A38.6.3.3 Pressure altitude;

A38.6.3.4 Static air temperature;

A38.6.3.5 Airplane gross mass and CG for each test point;

A38.6.3.6 Levels of electrical and mechanical power extraction and bleed flow;

A38.6.3.7 Engine performance:

A38.6.3.7.1 For jet airplanes, engine power setting; or

A38.6.3.7.2 For propeller-driven airplanes, shaft horsepower or engine torque, and propeller rotational speed;

A38.6.3.8 Fuel lower heating value;

A38.6.3.9 When volumetric fuel flow meters are used, fuel specific gravity and kinematic viscosity (see section A38.5.2.2.1.8 of this appendix);

A38.6.3.10 The cumulative error (RSS) of the overall measurement system (see section A38.5.1.7 of this appendix);

A38.6.3.11 Heading, track and latitude;

A38.6.3.12 Stability criteria (see section A38.4.2.2.2 of this appendix); and

A38.6.3.13 Description of the instruments and devices used to acquire the data needed for the determination of SAR, and the individual accuracies of the equipment relevant to their effect on SAR (see sections A38.5.1.6 and A38.5.1.7 of this appendix).

A38.6.4 Calculations and Corrections of SAR Test Data to Reference Specifications. The measured SAR values, corrections to the reference specifications and corrected SAR values must be provided for each of the test measurement points defined in § 38.13(b).

A38.6.5 Calculated Values. The following values must be provided for each airplane

used to establish fuel efficiency certification in accordance with this part:

A38.6.5.1 SAR (km/kg) for each reference airplane mass and the associated 90 percent confidence interval;

A38.6.5.2 Average of the 1/SAR values;

A38.6.5.3 RGF; and

A38.6.5.4 Fuel efficiency metric value.

PART 121—OPERATING REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS

■ 12. The authority citation for part 121 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40103, 40113, 40119, 41706, 42301 preceding note added by Public Law 112–95, sec. 412, 126 Stat. 89, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44729, 44732; 46105; Public Law 111–216, 124 Stat. 2348 (49 U.S.C. 44701 note); Public Law 112–95 126 Stat 62 (49 U.S.C. 44732 note).

■ 13. Amend § 121.141 by revising paragraph (b) introductory text to read as follows:

§ 121.141 Airplane flight manual.

* * * * *

(b) In each airplane required to have an airplane flight manual in paragraph (a) of this section, the certificate holder shall carry either the manual required by § 121.133, if it contains the information required for the applicable flight manual and this information is clearly identified as flight manual requirements, or an approved Airplane Manual. If the certificate holder elects to carry the manual required by § 121.133, the certificate holder must revise the operating procedures sections and modify the presentation of performance data, except for the information required by § 38.23 of this chapter identifying compliance with the fuel efficiency requirements of part 38 of this chapter, from the applicable flight manual if the revised operating procedures and modified performance data presentation are—

* * * * *

PART 125—CERTIFICATION AND OPERATIONS: AIRPLANES HAVING A SEATING CAPACITY OF 20 OR MORE PASSENGERS OR A MAXIMUM PAYLOAD CAPACITY OF 6,000 POUNDS OR MORE; AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

■ 14. The authority citation for part 125 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701–44702, 44705, 44710–44711, 44713, 44716–44717, 44722.

■ 15. Amend § 125.75 by revising paragraph (b) to read as follows:

§ 125.75 Airplane flight manual.

* * * * *

(b) Each certificate holder shall carry the approved Airplane Flight Manual or the approved equivalent aboard each airplane it operates. A certificate holder may elect to carry a combination of the manuals required by this section and § 125.71. If it so elects, the certificate holder may revise the operating procedures sections and modify the presentation of performance from the applicable Airplane Flight Manual if the revised operating procedures and modified performance data presentation are approved by the Administrator. Any approved equivalent must include the information required by § 38.23 of this chapter identifying compliance with the fuel efficiency requirements of part 38 of this chapter.

Issued under authority provided in 42 U.S.C 4321 *et seq.,* 7572, 49 U.S.C. 106(f), 40113, 44701–44702, 44703, and 44704 in Washington, DC.

Kevin Welsh,

Executive Director, Office of Environment and Energy.

[FR Doc. 2022–11556 Filed 6–14–22; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF COMMERCE

Bureau of Economic Analysis

15 CFR Part 801

[Docket No. 220608–0131]

RIN 0691–AA91

International Services Surveys: Renewal of and Changes to BE–120 Benchmark Survey of Transactions in Selected Services and Intellectual Property With Foreign Persons, and Clarifying When BE–140 and BE–180 Benchmark Surveys Are Conducted

AGENCY: Bureau of Economic Analysis, Commerce.

ACTION: Notice of proposed rulemaking.

SUMMARY: This proposed rule would amend regulations of the Department of Commerce's Bureau of Economic Analysis (BEA) to renew reporting requirements for the BE–120 Benchmark Survey of Transactions in Selected Services and Intellectual Property with Foreign Persons. This proposed rule would also amend the regulations for BEA's two other international services benchmark surveys, the BE–140 Benchmark Survey of Insurance Transactions by U.S. Insurance Companies with Foreign Persons and the BE–180 Benchmark Survey of Financial Services Transactions between U.S. Financial Services Providers and Foreign Persons, to clarify when the surveys will be conducted.

DATES: Comments on this proposed rule will receive consideration if submitted in writing on or before August 15, 2022.

ADDRESSES: You can submit comments, identified by RIN 0691–AA91, and referencing the agency name (Bureau of Economic Analysis), by any of the following methods:

- *Federal eRulemaking Portal: https://www.regulations.gov.* Follow the instructions for submitting comments. For Keyword or ID, enter ''EAB–2022–0002.''
- *Email: christopher.stein@bea.gov.*
- *Mail:* Christopher Stein, Chief, Services Surveys Branch (BE–50), Balance of Payments Division, Bureau of Economic Analysis, U.S. Department of Commerce, 4600 Silver Hill Rd., Washington, DC 20233.
- *Hand Delivery/Courier:* Christopher Stein, Chief, Services Surveys Branch (BE–50), Balance of Payments Division, Bureau of Economic Analysis, U.S. Department of Commerce, 4600 Silver Hill Rd., Suitland, MD 20746.

Written comments regarding the burden-hour estimates or other aspects of the collection-of-information requirements contained in the proposed rule should be sent to both BEA through any of the methods above and to the Office of Management and Budget (OMB) by submitting comments at *www.reginfo.gov/public/do/PRAMain.* Find this particular information collection by selecting ''Currently under Review'' or by using the search function and entering the title of the collection.

Public Inspection: All comments received are a part of the public record and will generally be posted to *https://www.regulations.gov* without change. Personal identifying information voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information. BEA will accept anonymous comments (enter N/A in required fields if you wish to remain anonymous).

FOR FURTHER INFORMATION CONTACT: Christopher Stein, Chief, Services Surveys Branch (BE–50), Balance of Payments Division, Bureau of Economic Analysis, U.S. Department of Commerce, 4600 Silver Hill Rd., Washington, DC 20233; email *christopher.stein@bea.gov* or phone (301) 278–9189.

SUPPLEMENTARY INFORMATION: The BE–120 Benchmark Survey of Transactions in Selected Services and Intellectual Property with Foreign Persons is a