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14 CFR Part 11 et al.

Type Certification Procedures for Changed Products; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 11, 21, and 25

[Docket No. 28903; Amdt. No. 11–45, 21–77, 25–99]

RIN 2120–AF68

Type Certification Procedures for Changed Products

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: This document amends the procedural regulations for the certification of changes to type certificated products. These amendments affect changes accomplished through either an amended type certificate or a supplemental type certificate. The amendments are needed to address the trend toward fewer products that are of completely new design and more products with multiple changes to previously approved designs. This final rule action will enhance safety by applying the latest airworthiness standards, to the greatest extent practicable, for the certification of significant design changes of aircraft, aircraft engines, and propellers.

DATES: Effective June 7, 2000. Mandatory compliance dates are December 10, 2001 for transport category airplanes and restricted category airplanes that have been certified using transport category standards, and December 9, 2002 for all other category aircraft and engines and propellers. Comments on the information collection requirements and the Regulatory Evaluation section, which includes the regulatory flexibility analysis, must be submitted on or before August 7, 2000.

ADDRESSES: Comments for this final rule should be mailed or delivered, in triplicate, to the Federal Aviation Administration, Office of the Chief Counsel, Attn: Rules Docket (AGC–200), Docket No. 28903, Room 915G, 800 Independence Avenue, SW, Washington, DC 20591. Comments submitted must include the regulatory docket or amendment number. Comments may also be sent electronically to the following Internet address: 9–NPRM–CMTS@faa.gov. Comments may be filed or examined in Room 915G on weekdays, except Federal holidays, between 8:30 a.m. and 5:00 p.m.

FOR FURTHER INFORMATION CONTACT: Randall Petersen, Certification Procedures Branch (AIR–110), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, telephone (202) 267–9583.

SUPPLEMENTARY INFORMATION:

Compliance Dates

This final rule requires that major changes to transport category airplanes and restricted category airplanes that have been certified using transport category standards, be evaluated under the new rules beginning 18 months from today's date of publication in the **Federal Register**. Major changes to all other category aircraft and engines and propellers are required to be evaluated under the new rules beginning 30 months from today's date of publication in the **Federal Register**.

Comments Invited

In the NPRM, the FAA certified that the proposed rule would not have a significant economic impact on a substantial number of small entities. The FAA has revisited the question of the potential impact on small entities and has determined that an analysis under the Regulatory Flexibility Act of 1980, as amended, is required. This analysis and a complete analysis of potential costs and benefits are set out in the Regulatory Evaluation Summary portion of this preamble. As stated in this final rule document, the FAA determined that there could be a significant impact on a substantial number of small entities. Additionally, the cost analysis of the regulatory evaluation has undergone a substantial revision, and comments on the entire regulatory evaluation are requested.

Since this rule is being adopted without prior notice and prior public comment on the increased information collection requirements listed in the Paperwork Reduction Act section of this document, interested persons are also invited to submit such written data, views, or arguments, as they may desire, relating to the information collection requirements.

Pending the evaluation of the public comments, the FAA has decided to proceed with due diligence. This rule differs from the NPRM and has been revised to address the concerns of the majority of small entities likely to be affected by the rule. The FAA will consider and respond to comments on the Regulatory Flexibility Analysis and the information collection requirements that are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 before the compliance dates published in this document.

The FAA will consider all comments received, and will publish in the **Federal Register** a summary of the disposition of those comments and, if appropriate, changes to the rule that may result from consideration of those comments.

Comments must include the regulatory docket or amendment number and must be submitted in triplicate to the address above. All comments received, as well as a report summarizing each substantive public contact with FAA personnel on this rulemaking, will be filed in the public docket and will be considered by the FAA. The docket is available for public inspection before and after the comment closing date.

Commenters who want the FAA to acknowledge receipt of their comments submitted in response to this final rule must include a preaddressed, stamped postcard with those comments on which the following statement is made: ''Comments to Docket No. 28903.'' The postcard will be date-stamped by the FAA and mailed to the commenter.

Availability of Final Rule

An electronic copy of this final rule may be downloaded, by using a modem and suitable communications software, from: the FAA regulations section of the FedWorld electronic bulletin board service (telephone: (703) 321–3339), or the Government Printing Office's (GPO) electronic bulletin board service (telephone: (202) 512–1661).

Internet users may reach the FAA's web page at http://www.faa.gov/avr/arm/nprm/nprm.htm, or the GPO's web page at http://www.access.gpo.gov/nara, for access to recently published rulemaking documents.

Any person may obtain a copy of this final rule by submitting a request to: FAA, Office of Rulemaking, Attention: ARM–1, 800 Independence Avenue, SW, Washington, DC 20591; or by telephoning (202) 267–9680. Individuals requesting a copy of this final rule should identify their request with the amendment number or docket number.

Persons interested in being placed on the mailing list for future rulemaking documents should request from the above office a copy of Advisory Circular No. 11–2A, Notice of Proposed Rulemaking Distribution System, that describes the application procedure.

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, requires the FAA to comply with

small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. Therefore, any small entity that has a question regarding this document may contact their local FAA official. Internet users can find additional information on SBREFA on the FAA's web page at http://www.faa.gov/avr/arm/sbrefa.htm and may send electronic inquiries to the following Internet address: 9–AWA–SBREFA@faa.gov.

Background

Statement of the Problem

Under the regulations in effect prior to the early 1940's, an applicant for a changed product, such as an alternate engine installation, was required to apply for a new type certificate and comply with the standards current at the time of application. This did not present an unreasonable burden on the applicant then because the airworthiness standards did not change appreciably over short periods of time. That is, the standards current at the time of an application for a change were essentially the same as those with which the original product had to comply. Since the early 1940's, however, rapid changes in technology have resulted in significant changes in the airworthiness standards over relatively short periods of time. Therefore, an applicant for an extensive change to a type certificated product, which required a new type certificate, could be faced with complying with safety standards that varied considerably from the standards for the original product. To relieve this situation, the FAA's predecessor agency required an application for a new type certificate only if the change was quite extensive.

In recent years, a trend has developed towards fewer products that involve substantial design changes that would require a new type certificate. In many cases, over a period of time, a series of changes could permissively be made to a product by amending its original type certificate such that the resultant model is substantially different from the original model. Although each changed product in such a series of changes may differ little from its immediate predecessor, the changes could collectively result in a product with considerable differences from the original product. As a result, many changed aeronautical products have not been required to demonstrate compliance with all the recent airworthiness standards. This rule is intended to clarify under what conditions more recent airworthiness amendments need to be applied to changed products.

In order to achieve this goal, the FAA published a proposed rule (Notice No. 97–7; 62 FR 24288, May 2, 1997) to amend the procedural regulations for the certification of changes to type certificated products whether the change is accomplished through an amended type certificate or through a supplemental type certificate. The FAA's purpose in including supplemental type certificates (STC) was to ensure that all significant changes to a type certificated product would follow the same procedure. A related purpose was to avoid creating a loophole that would allow a type certificate (TC) applicant to choose the STC process thereby avoid complying with later amendments.

History of Type Certification

Title 49 U.S.C. 44701 authorizes the FAA Administrator to promote safety of flight of civil aircraft in air commerce by prescribing minimum standards governing the design and construction of aircraft, aircraft engines, and propellers as may be required in the interest of safety, and such minimum standards governing appliances as may be required in the interest of safety.

Under 49 U.S.C. 44704, the FAA may issue type certificates, including supplemental type certificates, for aircraft, aircraft engines, propellers, and certain appliances.

The general certification procedures for products (aircraft, aircraft engines, and propellers) and parts are set forth in 14 CFR part 21 (part 21). As described in §§ 21.13 and 21.15, any interested person may apply for a type certificate by submitting an application accompanied by the required documentation to the FAA. Sections 21.16 through 21.21, 21.101, and 21.115 specify certain regulations and designate the applicable airworthiness standards for type certification of both new and changed products. The term ''changed product'' is used throughout part 21 and throughout this preamble to include changes that are made through an amended type certificate, as well as those made under a supplemental type certificate. A person who is not the type certificate holder has only the STC option while the type certificate holder has the option of applying either for an amended type certificate or for an STC.

Section 21.17 designates the applicable regulations for the issuance of type certificates. In order to be issued a type certificate, the applicant must show that the product complies with the airworthiness standards contained in one of the following 14 CFR parts, as applicable: Part 23 for normal, utility, acrobatic, and commuter category airplanes; part 25 for transport category airplanes; part 27 for normal category rotorcraft; part 29 for transport category rotorcraft; part 31 for manned free balloons; part 33 for aircraft engines; part 35 for propellers; and part 21 (§ 21.17(b) and (f)) for special classes of aircraft and primary category aircraft, respectively.

The airworthiness standards in these parts of the regulations may be amended as needed to reflect continually changing technology, correct design deficiencies, and provide for safety enhancements. An applicant for a type certificate is required under current § 21.17, with certain exceptions, to show that the product meets the applicable airworthiness standards that are in effect on the date of the application. The exceptions include instances in which the Administrator specifies otherwise, or in which the applicant either elects or is required under specific circumstances to comply with later effective amendments. In addition, the Administrator may prescribe special conditions.

Under § 21.16, special conditions may be prescribed if the Administrator finds that the existing airworthiness standards do not contain adequate or appropriate safety standards because of novel or unusual design features of the product to be type certificated relative to the design features considered in the applicable airworthiness standards. Also, under § 21.21(b)(1), if any applicable airworthiness standards are not complied with, an applicant may nevertheless be entitled to a type certificate if the Administrator finds that those standards not complied with are compensated for by factors that provide an equivalent level of safety. Such determinations are commonly referred to as ''equivalent safety findings'' and are made with respect to the level of safety intended by the applicable standard. In addition, under § 21.21(b)(2), an applicant may be denied a type certificate if the Administrator finds an unsafe feature or characteristic of the aircraft for the category in which type certification is requested, even though the aircraft may comply fully with the applicable airworthiness standards.

Taken together §§ 21.16, 21.17, and 21.21 designate the applicable airworthiness regulations for type certification and accommodate those circumstances when the airworthiness standards do not adequately cover the design features of a product. These sections recognize and balance the following four important considerations:

(1) The FAA is obligated, under 49 U.S.C. 44701, to keep the airworthiness standards required in the interest of safety, (i.e., parts 23, 25, 27, 29, 31, 33 and 35) as current as practicable.

(2) The type certificate applicant needs to know, early in a certification program, what the applicable airworthiness standards will be in order to finalize the detailed design of its product and to enable the applicant to make reasonable performance guarantees to its potential customers.

(3) In the interest of safety, rapid technological advances presently being made by the civil aircraft industry necessitate that the FAA be able to issue special conditions to address novel or unusual design features that it has not yet had an opportunity to address in the airworthiness standards through the general rulemaking process, or to address novel or unusual design features that were not considered by the appropriate airworthiness standards applicable to changes to type certificates.

(4) It is also important to allow flexibility in design. Wherever possible, the airworthiness standards of 14 CFR Chapter 1, subchapter C, are intentionally written as performance standards, and the procedural regulations permit design changes over the operational life of a product.

History of Type Certification of Changes

Part 21 designates the applicable airworthiness standards for changed products. Section 21.19 describes the circumstances in which an applicant for type certification of a changed product must apply for a new type certificate. As previously discussed, before the early 1940's, an applicant for a changed product, such as an airplane with an alternative engine installation, was required to apply for a new type certificate. For the reasons already described, by the early 1940's, an application for a new type certificate was required only if the change was quite extensive.

Under § 21.101, the original type certificate may be amended to include changes to the product when the applicant demonstrates that it complies with the same airworthiness standards as the original product plus appropriate special conditions, and the change does not warrant making a new application for a type certificate under § 21.19. Because § 21.101(a) and (b) are incorporated by reference in § 21.115, these procedures are equally applicable to persons applying for supplemental type certificates.

Section 21.101(a) requires that an applicant for a change to a type certificate must comply with either the regulations incorporated by reference in the type certificate or the applicable regulations in effect on the date of application, plus any other amendments the Administrator finds to be directly related. The ''regulations incorporated by reference'' are the regulations that were the certification basis for the original issuance of the type certificate or any later regulations that were the certification basis for any changes to the original type certificate.

If an applicant chooses to show compliance with the regulations in effect on the date of the application for the change, the applicant must also comply with any other amendments that are directly related. In some instances, a regulation may have been amended to become less stringent, while a related regulation has become more stringent. In this situation, an applicant must also comply with the related more stringent regulation. Current § 21.101(a) does not otherwise require compliance with later amendments and does not grant the Administrator the authority to require compliance with later regulations as a method to increase the level of safety of a product.

An applicant for a change to a type certificated product is responsible for showing that the product, as altered, not just the change itself, complies with the existing certification basis, because areas that have not been changed may be affected by the change. However, the applicant need not resubstantiate those areas of the product where the original substantiation has not been invalidated by the change.

Current § 21.101(b) pertains to changes for which the regulations incorporated by reference do not provide adequate standards. Such changes generally involve features that were not envisaged at the time the regulations incorporated by reference were adopted and are, therefore, novel or unusual with respect to those regulations. For these changes, the applicant must comply with regulations in effect on the date of application for the change as found necessary to provide a level of safety equal to that established by the regulations incorporated by reference. In this case, the applicant is not able to select any amendment of the regulation it chooses between those incorporated by reference and those in existence on the date of the application. When regulations in effect on the date of application for the change fail to provide adequate standards, the applicant must comply with special conditions to provide a level of safety equal to that established by the regulations incorporated by reference.

Trends in Type Certification of Changes

In recent years, a trend has developed toward fewer products that are of completely new designs, which would require new type certificates. Over a period of time, a series of changes to an original product may have been made so that the current model is considerably different from the original model. Although each changed product in such a series of changes may differ little from its immediate predecessor, the changes could result collectively in a product with substantial differences from the original product.

Another trend in manufacturing is to keep products in production over several decades. Some currently manufactured airplanes have, for example, evolved from airplane models originally type-certificated 25 years ago. This does not imply that those airplanes are ''unsafe,'' because they do, in practice, have features that address the intent of most of the current airworthiness standards. However, current procedural regulations (part 21) do not require that changed products demonstrate compliance with all the current airworthiness standards.

The basic premise behind the FAA's current policies for the procedures and airworthiness standards for type certification is that the highest possible degree of safety in the public interest should be achieved by products being certificated at any given time. In dealing with this premise, the FAA has had to continually weigh the desire for the highest level of safety with the cost to the manufacturers, operators, and traveling public for achieving the highest possible degree of safety in the public interest. This balance between safety and cost has been exacerbated by the introduction of highly sophisticated products whose development and manufacture have become enormously expensive. As already stated, this is one reason manufacturers choose to produce more and more changed products that, by the FAA regulations, are not required to have new type certificates.

The FAA maintains that the issue should not be whether a product is produced under a new type certificate or a changed one. The issue is whether or not the level of safety of the product, embodied in the airworthiness standards it complies with, is as high as practicable. In addition, to require areas unaffected by the change to comply with the later standards could not only be unreasonably costly but could reduce the level of safety of the product due to unforeseen developmental problems. The manufacturers are constantly issuing service information that

describes approved alterations that users may make to improve the level of safety of the product.

When establishing the highest practicable level of safety for a changed product, the FAA has determined that it is appropriate to assess the service history of a product, as well as the later airworthiness standards. It makes little sense to mandate changes to well understood designs, whose service experience has been acceptable, merely to comply with new standards. The clear exception to this premise is if the new standards were issued to address a deficiency in the design in question, or if the service experience is not applicable to the new standards. This consideration of airworthiness standards and service experience should form the basis for developing the certification basis for a change in a product.

While it can be argued that, for consistency, new airworthiness standards should apply across-the-board to the entire aircraft fleet, application of new standards would not be practical in every case. Although newly designed aircraft are required to meet all applicable current airworthiness standards, in many cases a product being changed, for which only an amended type certificate is needed, is required to meet only the standards referenced in the original type certificate or in an amended type certificate. Thus, there may be a considerable difference between the standards required for a new product and for a product undergoing change. A product undergoing change that met the applicable standards at the time of original or amended type certification is not currently required to meet more current airworthiness standards, except in those instances where retroactive regulations have been issued or the applicant elects to comply with later amendments.

In recent rulemakings, the FAA has carefully considered whether corresponding retroactive action is warranted whenever a change to the airworthiness standards for type certification was proposed. In those cases where it has been determined that an across-the-board safety benefit commensurate with the cost could be achieved, the rulemaking has also included a proposal to change the relevant operating regulations to require newly manufactured airplanes or airplanes in service, or both, to comply with the new standards, regardless of whether such compliance would be required as a condition of type certification. For instance, some of the regulations implemented in recent revisions to part 25 for newly designed airplanes were required for the existing fleet and were implemented in the operating regulations, such as part 121.

Recent FAA Actions

In addition to the safety considerations previously described, there has also been a growing international concern that some changed products are given an unfair competitive advantage over those that are of new design and must comply with later standards.

Because of these concerns, beginning in 1989 the FAA participated in an ad hoc committee sponsored by the Aerospace Industries Association of America, known as the International Certification Procedures Task Force (ICPTF). In addition to the FAA, this task force included representatives of the European Joint Aviation Authorities, Transport Canada Civil Aviation Authority (TCCAA), Aerospace Industries Association of America, Air Transport Association of America, General Aviation Manufacturers Association, International Air Transport Association, The European Association of Aerospace Industries (AECMA), Aerospace Industries Association of Canada, Air Line Pilots Association, and Association of European Airlines.

The ICPTF was organized to develop the philosophy and the necessary regulatory text and advisory material that would provide for the implementation of later regulatory amendments applicable to aeronautical products undergoing change, products in production, and products in service. The specific tasks of the ICPTF were: (1) develop the type certification philosophy for changes to aeronautical products, including revisions to the regulations and associated advisory material; (2) develop the necessary guidance information on the use of ''service experience'' in the type certification process; and (3) develop a method to evaluate the safety impact and cost effectiveness of revisions to the airworthiness standards.

In order to develop future proposed safety standards by using a system-type analysis, the FAA chartered a committee of safety experts, known as the Aviation Rulemaking Advisory Committee (ARAC), on February 5, 1991. This committee established the International Certification Procedures Working Group, which consisted of the original ad hoc committee formerly known as the ICPTF. The task assigned to this working group was to present to ARAC various proposals pursuant to its area of expertise. ARAC then had the option to submit these recommendations to the FAA, and the FAA would decide whether or not to issue a proposal based on the ARAC recommendations.

The working group presented to ARAC a recommended NPRM and associated advisory material concerning the type certification procedures for changes to aeronautical products, changed products, and products already in service. ARAC, in turn, submitted these documents, dated October 14, 1994, as recommendations to the FAA.

The rulemaking proposed by the FAA in Notice No. 97–7 reflects the ARAC recommendations in the type certification procedures for changed products with mostly minor changes in the preamble to the proposed rule. The Joint Aviation Authorities (JAA) have published similar proposed changes. That document was circulated for public comment on June 10, 1996, in NPA 21–7.

At the same time the FAA issued Notice No. 97–7, the FAA announced the availability of a proposed companion advisory circular (AC) for public comment. While the FAA's proposed AC was based on a draft submitted by the ARAC, the FAA's version was significantly reorganized and rewritten except for the proposed appendices which were identical to those recommended by the ARAC. Also, the FAA stated in Notice No. 97–7 that while the ARAC recommended that the safety benefit resource evaluation guide included in the proposed AC (Appendix 2) be considered an acceptable means of showing compliance with the exceptions of proposed § 21.101(b), the FAA included this guide for information purposes only. The FAA stated, ''The safety benefit resource guide does describe some of the kinds of issues that the applicant would address, and the FAA would consider, in determining the certification basis in accordance with the proposed rule.''

After the comment period on Notice No. 97–7 closed, the FAA tasked the ARAC to review the public comments and to recommend to the FAA a disposition of the comments and a draft final rule document. This final rule reflects most of the work of the ARAC under this task. This work was accomplished largely through a series of ARAC working group meetings held between August of 1997 and July of 1998. Because of an FAA imposed deadline date of September 1, 1998, the working group members submitted their comments to the ARAC based on a draft final rule dated August 4, 1998. The August 4, 1998, draft was based on the working group's previous recommended disposition of comments and on discussions and agreements reached at

the final working group meeting held on July 7–8, 1998. The ARAC, at FAA's request, forwarded a report that included this draft and the comments to the FAA at the August 24, 1998, issues meeting. At the time of the report, consensus had not been reached on the draft final rule. Because many of the comments received from working group members and from the full ARAC members before and at the August 24 meeting duplicated comments that were made on the NPRM, the FAA has not attempted to deal separately and repetitively in this preamble with these post-comment period ARAC comments.

FAA Rulemaking on Changed Products

This rulemaking amends the type certification procedures for changes to type certificated products to bring the certification basis for significantly changed products (whether the change is by amended type certificate, supplemental type certificate, or amended supplemental type certificate) closer to the current regulations. The intent is to ensure that when an essentially new product is developed through a series of changes, the final product achieves a level of safety similar to that of a comparable new product.

By this rulemaking, the FAA requires all proposed changes for all type-certificated products to comply with the latest amendments of the airworthiness standards, unless one of the stated exceptions applies. The long term result of this rule change will be that a changed product will have a certification basis that provides a similar level of safety to that provided by the certification basis of a new type certificate for the same product, except as provided in the rule.

As discussed more fully later in this preamble, the final rule contains an approach that was not discussed in the NPRM. This approach should help minimize the procedural burden for applicants for amended type certificates and STC's for aircraft (other than a rotorcraft) with a maximum weight of 6,000 pounds or less and for non-turbine rotorcraft with a maximum weight of 3,000 pounds or less.

As stated, the FAA will issue an advisory circular based on this rulemaking. This advisory circular will provide guidance on determining the certification basis for changed aeronautical products, including identifying the conditions under which it will be necessary to apply for a new type certificate. For the reasons discussed below, this final advisory circular will follow the draft AC originally proposed by the ARAC, with changes as necessary to conform to the final rule language and to international harmonization.

Discussion of Comments Received on the NPRM

The FAA received over 90 comments on the NPRM. Commenters included aircraft manufacturers and operators, organizations representing these groups, foreign entities, and individuals.

More than half of the comments focus on the issue of applicability of the proposed rule changes to supplemental type certificates (STC's) and type certification amendments for small part 23 airplanes, particularly older airplanes. Virtually all of these commenters state that the proposed rule and advisory circular were designed for transport category aircraft by persons involved in manufacturing or using transport category aircraft. These commenters urge that non-transport category aircraft not be included in the final rule. Several request an extension of, or reopening of, the comment period, stating that the in-service modifier community was not involved in the development of the NPRM and asserting that much of this community was not even aware of the NPRM until after the comment period closed. (For further detail, see discussion of comments under the heading ''Applicability to General Aviation Aircraft and to Supplemental Type Certificates.'')

Many of the commenters request that the preamble and advisory circular be rewritten to reflect more closely the recommendations by the Aviation Rulemaking Advisory Committee (ARAC). Many of these commenters state that one of the main purposes of this NPRM was to achieve harmonization with the Joint Aviation Authorities (JAA) and that to the extent the FAA departed from the ARAC recommendation, harmonization was lost because the JAA Notice of Proposed Amendment (NPA) was very closely aligned with the ARAC recommended document. (For further detail, see discussion of comments under ''ARAC Recommendation and Harmonization'' and ''Rewrite of AC from ARAC Draft.'') Comments that suggest specific substantive changes to the proposed rule language are summarized and addressed under the section-by-section portion of this preamble.

Many commenters made specific comments on the proposed advisory circular. These comments are not discussed in this document but are being considered by the FAA.

In view of the harmonization goal of this rulemaking and the intended close relationship between the FAA's Notice No. 97–7 and the JAA's NPA 21–7, the FAA included the comments received by the JAA in the FAA public docket and the ARAC reviewed the relevant comments on NPA 21–7. Except for the issue of applicability to aircraft modifiers, the comments on NPA 21–7 were mostly from the same entities that commented on this rulemaking and these comments did not differ significantly from the comments on FAA's Notice No. 97–7. Therefore, this document does not separately address the comments received on NPA 21–7.

General and Miscellaneous Comments

Comments: One commenter, in reference to the preamble section ''Recent FAA Actions,'' says that the FAA's mandate, under 49 U.S.C. § 44701, is to promote safety and safety regulations. This commenter says that the FAA has no mandate or legal basis for ''making regulations designed to manipulate competitive forces or marketplace decisions.''

Fairchild Aircraft Inc. (Dornier) also states its concern that the real problem being addressed by the FAA is not a safety problem, but rather the potential for an unfair trade advantage.

Hiller Aircraft expresses opposition to the proposal and states that current §§ 21.16, 21.19, and 39.1 already provide the FAA with ''the regulatory flexibility to prescribe applicable rules for any newly proposed design, any design being considered for change and any design found to be unsafe through field experience.'' Hiller says that the proposal would be administratively burdensome on the FAA and manufacturers, while not providing the FAA with any additional regulatory power. Fairchild also concludes that the proposed rule would only create more bureaucratic paperwork, and increase the cost of the certificated product without compensating increases in safety.

FAA Response: While international concern over potential unfair competitive advantages that could result if different standards are applied to similar changed products, was cited as one of the triggering events for this rulemaking, that concern was not the basis for justifying the changes proposed in Notice No. 97–7. As the NPRM preamble described at some length, and as summarized in the Background section of this preamble, the FAA's justification for the proposed change was a safety justification, namely, to ensure that significantly changed products comply with later requirements that apply to new products to the maximum extent practicable.

With respect to the possible increased administrative burden on the FAA, this rule will, to some extent, decrease the FAA's administrative burden. Under the present rule, the FAA must demonstrate that the regulations incorporated by reference in the type certificate are not adequate to achieve the established level of safety when an applicant applies for a change to a type certificate. Under the proposed and final rule language, except for certain specified smaller aircraft, the initial burden will be on the applicant to show that it should not be required to comply with the regulations in effect on the date of the application because it meets one of the stated exceptions. As stated in the NPRM, compliance with the regulations in effect on the date of application where required by this rule will enhance the level of safety for the changed product. The burdens on the applicants are unavoidable if the objectives of the rule are to be achieved. Advisory Circular 21.101–XX that will be issued prior to the mandatory compliance dates of this rule will contain guidance intended to reduce the administrative burden on both the applicant and the FAA.

Retroactive and Retrofit Requirements

Comments: The European Association of Aerospace Industries (AECMA) states that the ''key point in ensuring steps forward in safety is to clearly define the applicability of the new standards at the time of the rule elaboration.'' Applicability to changed, newly manufactured or in-service aircraft may be mandated through appropriate amendments to CFR §§ 23.2, 25.2, 27.2 and 29.2 (special retroactive requirements), or to the operational regulations (for instance part 121, subpart J).

AECMA also states that the methodology used to assess possible retroactive applicability of new standards should follow the principles of AC 21.101–XX, Appendix 2, with the necessary adjustments for each category of product. In addition, the harmonization process should be extended to the retroactive requirements. While promoting the implementation of the real safety improvements, this approach would allow the manufacturers to clearly anticipate the requirements applicable to their products, instead of entering into case by case non-public discussions with possible unequal treatment.

FAA Response: Whenever the FAA adopts a new design requirement, it determines whether to apply that requirement to previously type certificated, but changed products, through a retroactive design requirement, or to previously manufactured aircraft through an operating rule. However, that determination is not the same as the determination that must be made when the FAA receives an application for a changed product. The determination of which amendments should be applied depends on the safety benefits to be realized from the proposed change, and the design, operational, and other cost burdens. Therefore, the FAA does not agree that the generalized normal retroactive and retrofit determinations are sufficient for dealing with specific changed products.

Consistency of Application within FAA

Comments: Raytheon suggests that in conjunction with the implementation of this rule the FAA should consider an Aircraft Certification Office (ACO) oversight program that would include (1) annual review of ACO's and new changes to type certificated products; (2) quarterly report submittal from ACO's stating amendment level of rules mandated for incremental changes; and (3) feedback from the FAA Directorate if it sees a consistent pattern from one ACO where the later rule amendments are not being imposed. Raytheon's recommendations are intended to ensure more equitable compliance requirements to avoid giving some region or manufacturer an economic advantage. Raytheon also recommends that the FAA implement an appeal process for an applicant who strongly disagrees with an ACO decision.

FAA Response: One of the tasks assigned to the ARAC was to assist the FAA in developing follow-up training for both government and industry to facilitate implementation of this final rule. It is the FAA's intent that all FAA employees called on to implement this final rule will receive appropriate training and implementation documents, such as internal orders and handbooks. The FAA will also implement other appropriate follow-up actions to ensure that the rule is being implemented uniformly throughout the FAA.

The ability of an applicant to appeal an ACO certification decision would not be changed by this rule. If not sooner resolved by the FAA appeals process (through the accountable Directorate), such a decision would be, ultimately, adjudicated as part of a certificate denial. A certificate denial is a ''final order of the Administrator,'' appealable to a U.S. Court of Appeals pursuant to 49 U.S.C. § 46110.

Potential for Adverse Safety Effect

Comments: One commenter predicts that the likely effect of enacting the proposed rule will be that no changes to existing aircraft designs will be incorporated due to the increased cost of certification. As a result, no safety improvements would occur.

Representatives of the in-service modifier community make the same point with respect to safety improvements that would require an STC. (See discussion under ''Applicability to General Aviation Aircraft and to Supplemental Type Certificates'').

FAA Response: The FAA does not agree that this rule will be a disincentive. The FAA recognizes the impact on airlines and independent modification companies of the requirement to have the data in order to determine significance. However, the FAA needs, in the interest of safety, to ensure that all significant changes move to the latest certification basis for affected areas when the change would contribute materially to the level basis of safety of the changed product and would be practical.

ARAC Recommendation and Harmonization

Comments: The most common issue discussed by the commenters (who were not focused on the in-service modifier/STC issue) related to the differences between the FAA NPRM and accompanying draft AC and the ARAC documents, and the resulting lack of harmonization with the JAA NPA which the commenters state is closer to the ARAC recommendation.

The United Kingdom's Civil Aviation Authority (CAA) states that in the NPRM the FAA policy appears to be moving towards accepting previously certificated products with a greater level of change before requiring certification as a new product. CAA comments support the need to positively limit the extent to which manufacturers should be allowed to change products without being required to certificate a product to the latest airworthiness standards. CAA suggests that the harmonization of FAA and JAA requirements remains incomplete until it is clearly understood by both FAA and JAA the extent to which the criteria for a changed product is to be applied in a particular instance.

The General Aviation Manufacturers Association (GAMA) submitted the complete ARAC recommendation dated October 14, 1994, with its comment and requests that the FAA reconsider the original ARAC recommendation in developing the final rule. Other

commenters that state their concern that the FAA's NPRM and draft advisory circular were significantly different from the original ARAC recommendation (and therefore different from JAA's NPA 21–7) are the European Association of Aerospace Industries (AECMA), Pratt and Whitney Canada, Bombardier, and the Aerospace Industries Association.

FAA Response: A number of the commenters suggest rewording of the NPRM preamble to make it consistent with the document submitted by the ARAC to the FAA. The FAA has considered the substance of these comments and where appropriate, they are addressed in this final rule preamble. In general, the differences between Notice No. 97–7 and the document submitted to the FAA by the ARAC involved additional preamble language included by the FAA to clarify the intent of the proposed changes. With one exception the proposed rule language in Notice No. 97–7 was identical to the rule language recommended by the ARAC. The draft AC, which is a non-binding tool to aid compliance, is discussed later in this preamble.

Applicability to General Aviation Aircraft and to Supplemental Type Certificates

Comments: Over half of the comments received focus exclusively on the question of the applicability of the proposed changes to aircraft that are not certificated under part 25 (i.e., to non-transport category aircraft, frequently referred to by commenters as ''general aviation aircraft'') and the applicability to supplemental type certificates in general. Most of these commenters state that part 23 aircraft should be entirely excluded from this rulemaking. The specific substantive statements are summarized below.

The thrust of the comments from the general aviation and in-service modifier communities received in the public docket fell into one or more of the following categories:

1. The in-service modifier community was not aware until late in the comment period that the ARAC recommendation and the resulting FAA Notice No. 97–7 would affect it at all. Several request an extension of the comment period.

2. The basis for Notice No. 97–7 was developed and recommended by an ARAC working group composed entirely of representatives of manufacturers of transport category aircraft and their counterparts in the represented civil aviation authorities. The in-service modifier community believed that the ICPTF/ARAC working group was focused on a problem involving the manufacture of transport category aircraft, not the alteration of general aviation aircraft. The in-service modifier community argues that the older the aircraft, the more the burden would increase on STC applicants and the less relevant would be the problems and examples used to justify the rule change.

3. Notice No. 97–7 gave no indication that it would affect applicants for supplemental type certificates and none of the stated justification warranted changing the rules for STC's.

4. Nowhere in Notice No. 97–7 is there any statement to indicate a problem with STC's. The entire discussion of the problem, the regulatory history, and recent FAA actions used aircraft manufacturing examples and mostly examples involving transport category airplanes.

5. Little or no consideration was given to the potential impact of the proposed rule and associated advisory material on general aviation aircraft production or on the STC process. For example, the finding under the Regulatory Flexibility Act that the proposed amendments would not have a significant economic impact on a substantial number of small entities ignores the potential impact on persons seeking STC's for general aviation aircraft.

6. Substantively, and therefore of most significance, the proposed change would shift the burden from the FAA to the applicant to prove whether a proposed change should comply with type design amendments that have occurred after the original type certificate was issued. The in-service modifier comments and representatives state that this change in burden from a ''bottom up'' approach to a ''top down'' approach would add significant costs to numerous small businesses which apply for the majority of current STC's. The in-service modifiers also dispute the relevance of FAA Order 8110.4 that established a top-down approach as a matter of policy in 1990. The in-service modifiers state that this order cannot be used to justify the rule changes proposed in Notice No. 97–7 because it was not enforceable since the rule was not changed and further because the FAA has not previously sought to apply this policy to STC's. For these reasons, this community was not even aware of its existence.

Specific written comments on the STC issue can be summarized as follows:

GAMA, EAA, NATA, and AOPA state that the proposal would be burdensome for older general aviation airplanes that would have to undergo significant and costly changes each time the in-service product is upgraded under STC procedures. GAMA adds that the re-entry into production of airplanes with older type certificates would be prevented because ''product changes dictated by the FAA would be so extensive that changed products would not be cost effective due to the expense of such changes.'' EAA states that the change ''will block safety improvements in general aviation aircraft by creating such a difficult barrier to approving Supplemental Type Certificates (STC's) that few improvements will be attempted on older aircraft designs.'' These commenters believe that the rule could have exactly the opposite of the intended effect by discouraging general aviation aircraft owners from improving their aircraft.

GAMA and AOPA state that, if present type certificate holders were prevented from resuming production due to economic reasons, the result would be a lack of spare parts and technical assistance needed by current airplane owners for the continued airworthiness of their airplanes.

GAMA says that the proposal would, in effect, ''render the type certificates for older out-of-production airplanes valueless due to the extensiveness of mandated FAA product changes. . . .'' AOPA states that the ''proposed changes would have a tremendous negative impact on the fledgling revitalization of the general aviation industry in this country by rendering nearly all existing out of production type certificates virtually valueless.''

NATA states that the NPRM fails to specifically limit the application of the rule and expresses concern that the rule requirements could be applied to unintended areas such as maintenance.

FAA Response: The ARAC recommended an exception from the most burdensome impact of this rulemaking for a significant segment of aircraft that are mostly used in general aviation operations. The FAA has adopted, in this final rule, a process that will apply to changes to these aircraft. Therefore, as is more fully discussed and explained in the section by section discussion of § 21.101, changes to aircraft (other than rotorcraft) with a maximum weight of 6,000 pounds or less and non-turbine powered rotorcraft with a maximum weight of 3,000 pounds or less, will be evaluated starting with the latest certification basis for changes to a type certificate (whether through an amendment or an STC). This exception should address the concerns of most of the in-service modifiers listed above. Reduction of the potential costs from this change are discussed in the

Regulatory Evaluation Summary portion of this preamble.

While it is unfortunate that the in-service modifier community may not have recognized the potential impact on it of this rulemaking, the in-service modifier community had full opportunity to participate in the ARAC process from the date that the FAA tasked the ARAC. The fact that in-service modifier interests may not have been fully represented in the ARAC working group is not because in-service modifiers were excluded but because they elected not to participate until after the NPRM was issued.

The working group distributed its draft NPRM and AC to all ARAC members on August 30, 1994, for review and consideration. The ARAC met on October 13 and unanimously passed the proposals as written, with no substantive comments or changes. Among the organizations present at the October 13 meeting were several in-service modifier community representatives, such as, Aviation Repair Station Association (ARSA), National Air Transportation Association (NATA), Experimental Aircraft Association (EAA), General Aviation Manufacturers Association (GAMA), and the Airline Suppliers Association (ASA).

Furthermore, while the FAA decided not to extend or reopen the comment period, as previously noted, representatives of the ARAC working group and the FAA met with representatives of in-service modifiers on several occasions during the ARAC working group meetings to dispose of the comments to the NPRM. Additionally, representatives from the General Aviation community met with the Associate and the Deputy Associate Administrators for Regulation and Certification to express their concern with the conduct of the working group meetings. Their concerns were addressed and a record of these meetings are reflected in the docket.

The STC issue and potential applicability to non-transport category airplanes were addressed in Notice No. 97–7. Section 21.1(a) of part 21 prescribes procedural requirements ''for the issue of type certificates *and changes to those certificates;* the issue of production certificates; the issue of airworthiness certificates; and the issue of export airworthiness approvals.'' (Emphasis added.) Supplemental type certificates are not mentioned in § 21.1 or throughout part 21 because the word ''changes'' is clearly used to cover all possible changes to a type certificated product whether made by the type certificate holder, the aircraft owner, or a third party. Section 21.19 states that certain changes will require a new type certificate. Subpart D of part 21 prescribes ''procedural requirements for the approval of changes to type certificates.'' Subpart E covers supplemental type certificates, which § 21.113 states must be applied for by any person ''who alters a product by introducing a major change in type design, not great enough to require a new application for a type certificate under § 21.19 . . . except that the holder of a type certificate for the product may apply for amendment of the original type certificate.'' Section 21.115, which Notice No. 97–7 proposed to amend, states that an applicant for an STC must ''show that the altered product meets applicable airworthiness requirements'' of § 21.101, that is, the same requirements that would apply to the holder of the type certificate. Thus, persons familiar with part 21, as are the representatives of the major in-service modifiers that commented on Notice No. 97–7, know that each proposed rule that affects ''changes'' under part 21 has potential broad application.

Notice No. 97–7 contained numerous statements that made it clear that the proposed amendments to existing regulations would affect persons other than transport category type certificate holders. For example:

1. Section 21.115, which applies to all applicants for an STC, is referenced early in the ''History of Type Certification'' section of the preamble.

2. In the ''History of Type Certification of Changes'' section of the preamble the following sentence appears:

> Because § 21.101(a) and (b) are incorporated by reference in § 21.115 these procedures are equally applicable to persons applying for supplemental type certificates.

3. In the ''Recent FAA Actions'' portion of the preamble the following sentences appear:

> The ICPTF was organized to develop the philosophy and the necessary regulatory text and advisory material that would provide for the implementation of later regulatory amendments applicable to aeronautical products undergoing change, products in production, and *products in service.* (Emphasis added.)
>
> The working group presented to ARAC an NPRM and associated advisory material concerning the type certification procedures for changes to aeronautical products, changed products, and products *already in service.* (Emphasis added.)

4. In the section by section discussion of § 21.115 the following sentence appeared:

> There should not be a difference in the certification basis for a change to a type-certificated product between these two methods of approval, amended type certificate, or supplemental type certificate.

5. In the Regulatory Evaluation Summary the following sentence appears:

> The formalization of this policy by regulation would expedite decisions about the certification basis of proposed changed products and, therefore, would provide manufacturers and modifiers with earlier and more dependable information on which to base their product development decisions.

In view of the opportunity provided by the ARAC process before and after issuance of Notice No. 97–7 and the number of references to STC's and modifiers throughout the NPRM preamble, the in-service modifier community had adequate notice of the potential impact of Notice No. 97–7 and adequate opportunity to participate. In the Regulatory Evaluation Summary portion of this preamble the FAA has revisited the question of the potential impact on small entities and has determined that an analysis under The Regulatory Flexibility Act of 1980, as amended, is required. This analysis and a complete analysis of potential costs and benefits are set out in the Regulatory Evaluation Summary portion of this preamble.

Transport Category Aircraft STC's

Comments: ATA says that the proposal's requirement for an applicant to prove that a proposed change to be accomplished under an STC does not invoke a new safety standard will consume time and resources without improving airworthiness. ATA says that the current STC process is effective in ensuring that changes to an aircraft design are airworthy and recommends that the FAA exclude STC's from the proposed rule.

FAA Response: As discussed in the preamble to the NPRM Notice No. 97–7, the FAA has determined that an application for a design change through the STC process should be certificated to the same level of safety as an application for the same change through an amended type certificate. The FAA's intent is to establish an airworthiness certification basis that is not dependent on whether the applicant is applying for an amended or a supplemental type certificate.

Section-by-Section Discussion

Section 11.11

Current § 11.11 lists special conditions required as prescribed under § 21.101(b)(2) as an FAA record that is

maintained in current docket form in the Office of the Chief Counsel. To remain consistent with the changes to § 21.101, described later, the NPRM proposed to amend § 11.11 to refer to § 21.101(c) (now § 21.101(d)) instead of § 21.101(b)(2). The NPRM also proposed revisions to make the section read easier.

There were no substantive comments on this section and it is adopted as proposed with the cross-reference change described above.

Section 21.19

Current § 21.19(a) states that any person who proposes to change a product must make a new application for a type certificate if the Administrator finds that the proposed change in design, configuration, power, power limitations (engines), speed limitations (engines), or weight is so extensive that a substantially complete investigation of compliance with the applicable regulations is required. In addition, current paragraphs (b), (c), and (d) list other specific types of changes that mandate a new application for a type certificate. Notice No. 97–7 proposed to include only the general language of current paragraph (a) into the new § 21.19, while the previously listed specific changes would be subject to case-specific evaluations to determine whether they are substantial.

Current § 21.19(b) describes specific changes for which the applicant must apply for a new aircraft type certificate. These include (1) changes in the number of engines or rotors; and (2) changes to engines or rotors using different principles of propulsion, or to rotors using different principles of operation. Historically, these types of changes have fallen into one of two categories—those that were not extensive enough to require a new application for a type certificate, as evidenced by the large number of exemptions that have been granted over the past quarter century, or those that were so extensive that a new application was required because a complete investigation of compliance was required. Accordingly, as was discussed in the NPRM preamble, the provisions of current § 21.19(b) are not needed and were not included in the proposal.

Recently, the FAA considered a petition for exemption from 14 CFR § 21.19(b)(2), to replace turbopropeller engines with turbofan engines on a transport category airplane. The petitioner argued that the certification basis for the changed airplane should be developed using the approach proposed in the NPRM. In responding to the petition, the FAA pointed out that while the NPRM proposed to eliminate the specific reference to a change to engines using different principles of propulsion, that kind of change normally would be considered so extensive that a substantially complete investigation of compliance would be required. Thus, it should be noted that new § 21.19 does not necessarily change how one would evaluate ''extensive'' in each case. Instead, new § 21.19 eliminates the legal presumption that certain changes are automatically ''extensive.''

Current § 21.19(c) describes another specific change in which the applicant must apply for a new aircraft engine type certificate. This change is in the principle of operation. In addition, current § 21.19(d) describes specific changes in which the applicant must apply for a new propeller type certificate. The NPRM proposed to delete these types of changes from § 21.19. Under proposed § 21.101, with certain exceptions, these types of changes and all areas, systems, components, equipment, and appliances affected by the changes would have to comply with the regulations in effect on the date of application for the change to the type certificate.

Comments: CAA recommends that this section (§ 21.19) be cross-referenced in § 21.101(a).

One commenter recommends that wing modifications be added to the list of design changes listed in the preamble. This would be written as: ''New wing (external geometry, structure, and performance.)''

FAA Response: The CAA comment is discussed under § 21.101(a). The list of design changes typically regarded as substantial that were referenced in the NPRM preamble have not been included in this document. However, they will be addressed in the forthcoming Advisory Circular. Section 21.19 is adopted as proposed.

Section 21.101(a)

Current § 21.101(a) states that if a person applies for a change in a type certificate, the product must comply with either the regulations referenced in the type certificate or the applicable regulations in effect on the date of the application for the change, if elected by the applicant, plus any other amendments the Administrator finds to be directly related.

In Notice No. 97–7, the FAA proposed to amend § 21.101(a) to require an applicant for a change to a type certificate to comply with the applicable regulations in effect on the date of the application for the change and with parts 34 and 36, unless the applicant falls within one of the exceptions that would allow compliance with an earlier amendment. The primary purpose of this proposed change was to ensure that products being changed in a significant manner meet the latest airworthiness standards wherever practicable.

Under this approach, the starting basis is the applicable regulations in effect on the date of the application for the change. The burden is on the applicant to prove that compliance with earlier regulations would provide an acceptable safety level. Under the current regulation, the starting basis is the regulations incorporated by reference in the type certificate. In this case, the burden is on the FAA to find that later amendments are directly related to the proposed change, or that there are other reasons (e.g., the regulations incorporated in the type certificate do not provide adequate standards with respect to the proposed change) for requiring compliance with later amendments.

The FAA points out that current part 21 and amendments resulting from this rulemaking, only address ''major'' type design changes under § 21.93. ''Minor'' design changes are ''approved'' under § 21.95, and are not considered to be the changes to a type certificate that are covered under § 21.101.

Comments: The comments that address the substantive issue of the safety justification for, and potential cost of, changing from an original or previously amended certification basis approach to a current amendments approach were addressed earlier in the General and Miscellaneous Comments section of this preamble.

The CAA says that § 21.101(a) should be amended to cross reference § 21.19 to clarify that this section applies only when a new type certificate is not required under § 21.19. The CAA suggested rewording the paragraph to read as follows:

> Where the Administrator finds that an application for a new type certificate is not required under § 21.19 and except as provided in paragraph (b). . . .

Raytheon recommends that proposed paragraph (a)(1) of § 21.101 be rewritten so that the word ''and'' after the term ''changed product'' is deleted.

FAA Response: The FAA does not agree with the CAA's suggested rewording as § 21.19 stands on its own and there is no need for a cross-reference to it in § 21.101. As rewritten, the ''and'' in § 21.101(a)(1) is not included. The general phrase, ''airworthiness requirements applicable to the category of product'' has been substituted for the references to parts 23, 25, 27, 29, 31, 33, and 35. As

adopted, § 21.101(a), with minor revisions for clarification, replaces proposed § 21.101(a)(1) and (2) without substantive changes.

Section 21.101(b)

Proposed § 21.101(b) provided exceptions to the regulation in proposed paragraph (a), that, when met, would allow the applicant to comply with earlier amendments to the regulations. When choosing the amendment level of a regulation, all regulations associated with any relevant paragraphs in that amendment level would have to be included. The amendment level chosen may not predate either the latest certification basis or anything required by the retroactive sections, that is, §§ 23.2, 25.2, 27.2, or 29.2.

The intent of the proposed change was to apply the applicable regulations in effect on the date of the application to those areas, systems, components, equipment, and appliances significantly affected by the change, unless the Administrator finds that compliance with a regulation would not, (1) contribute materially to the level of safety of the changed product, or (2) would be impractical. For those areas, systems, components, equipment, and appliances not significantly affected by the change, or otherwise excepted, continued compliance with the regulations incorporated by reference in the type certificate would be considered acceptable.

Proposed paragraph (b)(1) stated that the applicant would be allowed to demonstrate compliance with earlier regulations, but not earlier than the regulations incorporated in the latest certification basis, if the effect of the proposed change is not significant, taking into account earlier design changes and previous updating of the type certification basis.

Proposed paragraph (b)(2) stated that the applicant may show compliance with earlier regulations for those areas, systems, components, equipment, and appliances that are not affected by the change.

Proposed paragraph (b)(3) stated that, if compliance with a regulation in effect on the date of the application for the change would not contribute materially to the level of safety of the product to be changed, or would be impractical, the applicant may demonstrate compliance with an earlier amendment of a regulation provided that the amended regulation does not precede either the corresponding regulation in §§ 23.2, 25.2, 27.2, or 29.2 of this chapter, or the corresponding regulation incorporated by reference in the type certificate.

A proposed advisory circular contained a safety benefit resource evaluation guide, which was recommended by the ARAC to be an acceptable means of compliance with the ''impractical'' exception of proposed § 21.101(b)(3), but which was included by the FAA for purposes of information only.

For the reasons discussed in more detail below, proposed § 21.101(b) is adopted with minor clarification changes, but without substantive changes.

Comments: Erickson Air-Crane Co. recommended a change in the wording of the rule to make it clearer that ''You don't comply with the amendment alone, but rather the entire regulation at a given amendment level.''

FAA Response: The FAA does not agree that an applicant would always have to comply with an entire amendment level. The proposal was to require compliance only with the relevant portions of a particular amendment level.

Comments: CAA states that the objective of the certification policy for changed products should be to ensure, as far as is practicable, that a changed product will achieve the same level of safety as a new product introduced concurrently. CAA states that the proposal, Notice No. 97–7, will not achieve this objective for the following reasons:

(a) The proposed § 21.101(b)(2) allows areas not affected by the change being considered to continue to use superseded airworthiness requirements, some of which may have been amended with the objective of improving the general level of safety. The fact that a product is a changed product, rather than a new product, should not be the reason for allowing it to continue to use outdated safety standards indefinitely. Even for areas not affected by the changes there needs to be a point beyond which a changed product is required to comply with the latest standards where amendments have been made as part of an initiative to improve general safety levels in such areas.

(b) The proposed § 21.101(b)(3) allows the continued use of superseded airworthiness requirements where compliance ''would not contribute materially to the safety of the changed product.'' Although NPRM 97–7 acknowledges the need to assess the accumulative effect of a number of small changes on the level of safety, the text of Paragraph (b)(3) is written in terms of the effect of a single change . . . there is a need to establish the datum as the original design standard of the product originally certificated.

CAA believes that § 21.101(b) is difficult to understand and should be re-drafted and cross-referenced to paragraphs (b)(1), (b)(2), and (b)(3).

CAA comments, as it did on the JAA proposal that the phrase ''For each area, system, component, equipment, or appliance'' should be replaced with ''For each feature of the product.'' CAA acknowledges that this change, if adopted, would require extensive interpretive material to clarify what the word ''feature'' means.

FAA Response: There is very little language difference, and no substantive difference, between the FAA's proposed rule language and the language in JAA's NPA 21–7. Nonetheless, for reasons discussed below, § 21.101(b) has been rewritten for clarification. The ARAC working group had numerous discussions as to the meaning of ''nonsignificant'' in the proposed rule. The working group focused particularly on the draft Advisory Circular (AC) circulated for public comment at the same time as Notice No. 97–7 because the draft AC contained language explaining ''nonsignificant.'' The ARAC recommended that some of the proposed AC language be included in the final rule to make it clear, in determining whether a change would be nonsignificant, that an applicant would go back to the latest certification basis and not the original certification basis. The draft AC provided that the following are nonsignificant:

''Changes that do not modify the general characteristics of the product in that: (1) The general configuration and principles of construction are retained; and (2) The assumptions used for certification of the basic product remain valid and the results can be extrapolated to cover the changed product.''

In view of the ARAC discussions, the FAA has decided that it would be helpful to use the affirmative term ''significant'' rather than the negative term, ''nonsignificant'' and to more fully explain in the rule itself the term ''significant.'' As adopted § 21.101(b)(1) reads as follows:

(b) If paragraphs (b)(1), (2), or (3) of this section apply, an applicant may show that the changed product complies with an earlier amendment of a regulation required by paragraph (a) of this section, and of any other regulation the Administrator finds is directly related. However, the earlier amended regulation may not precede either the corresponding regulation incorporated by reference in the type certificate, or any regulation in §§ 23.2, 25.2, 27.2, or 29.2 of this chapter that is related to the change. The applicant may show compliance with an earlier amendment of a regulation for any of the following:

(1) A change that the Administrator finds not to be significant. In determining whether a specific change is significant, the Administrator considers the change in context with all previous relevant design

changes and all related revisions to the applicable regulations incorporated in the type certificate for the product. Changes that meet one of the following criteria are automatically considered significant:

(i) The general configuration and the principles of construction are not retained; and

(ii) The assumptions used for certification of the product to be changed do not remain valid.

This language should help both the applicant and the FAA reviewer to determine whether the effect of a change is significant, when considered in context with all previous changes to the design and all related changes to the latest ''certification basis.'' Again, the overall intent of this rulemaking is to ensure that products developed through a series of changes, achieve a level of safety similar to that of a comparable new product. The final rule language makes it clear that, in determining whether a change is significant, the FAA will consider the latest amendments to the airworthiness standards adopted after the most recent type certification basis.

This is particularly important because a subsequent amendment of a regulation can indicate an important change in the emphasis in an area of the regulations. For example, if the regulations have been amended in an affected area, then the assumptions used for certification of the product may no longer be valid. The FAA considers these changes in the rule language to be clarifying since they are consistent with the intent of Notice 97–7 and with the explanations given in the accompanying draft Advisory Circular.

Comments: One commenter states that the FAA should reconsider its proposal to delete the existing § 21.101(b)(1) that allows the FAA to apply later regulations without regard to the exceptions in proposed § 21.101(b)(1), (2), and (3). This commenter provides an example of a transport category airplane with an early certification basis built with independent round dial instruments. The commenter notes that a number of rules were added that applied to replacing independent round dial instruments with a multifunction display or an electronic flight instrument system. The commenter suggests that the proposed rule would preclude compliance with the added rules for that kind of design change.

This commenter suggests that proposed § 21.101(b)(3) is not an improvement over the issue paper process, where that applicant would have an opportunity to apply for an exemption from the rule, which the applicant did not agree with, through a public notice process.

This commenter also expressed concerns regarding the use of the service history of an already changed product when analyzing the ''impractical'' exception to application of the latest regulations to a change of that product. Specifically, the commenter is concerned that, when a later rule addresses hazards or failures in very small probabilities and a product change is certificated using that later amendment, the older version of that product may have not yet reached the total exposure to the hazard or failure addressed by the later rule. In this case, the service history of the older version of the product would ''bask in the glow'' of the uneventful service history of the newer version that complies with the later amendment, making it appear that compliance with the latest amendments would be unwarranted.

Additionally, this commenter states that the preamble discussion of ''impractical'' mentions both a cost analysis and a benefit-resource evaluation and states that the applicant will only be able to provide a cost analysis and that there would not be enough data to make a comparison.

This commenter does not believe the use of a cost/benefit analysis to be practical as a tool to determine if a later rule should be applied under the proposed § 21.101. The commenter states that if such an approach is used then the FAA should at least eliminate the proposed AC Appendix 2 as it appears biased and without justification.

The ARAC working group had numerous discussions on the limited applicability of the data in Appendix 2 of the draft AC because this data was drawn from, and therefore only applicable to, transport category airplanes. The ARAC recommended that data be developed for other airplanes and for rotorcraft. The ARAC also recommended delayed compliance dates to allow time for development of this data.

FAA Response: The FAA construes the first comment to mean that the exceptions in proposed § 21.101(b)(1), (2), and (3) are too broad, so as to overly limit FAA discretion to impose later requirements. With respect to the example, the FAA notes that such a design change would be significant, and that it would be difficult, if not impossible, for the applicant to demonstrate that one of the exceptions applies. Therefore, compliance with the later regulations would most likely be required. The FAA has found that the public interest is satisfied by limiting the situations of required compliance with the latest airworthiness standards to each significant change, each area affected by the change, and each instance where compliance would contribute materially to the level of safety of the product and would be practical. In addition, special conditions may be required in accordance with the existing regulations. Nothing more is necessary for the safety enhancement of changed products.

Regarding the second comment, proposed § 21.101(b)(3) was not intended to replace the issue paper process, but to change the standards of certification, allowing an applicant to use earlier regulations if compliance with the latest regulation has been determined to be impractical or would not contribute to the level of safety. An individual's right to request an exemption from any rule has not been eliminated. As a result of the issue paper process, the applicant may still decide to petition for an exemption. This final rule does not change the applicant's ability to apply for that exemption.

The commenter's concerns with respect to service history are unwarranted. First, as was noted in the preamble to the NPRM, the service history that would be considered in deciding whether to invoke an exception to compliance with a later amendment would be the applicable service experience. In the case cited by the commenter, the relevant, service experience applicable to a change to the later version of the product would be the service experience of that later version, which complies with the later amendment. The relevant, service experience applicable to a change to the older version of the product would be the service experience of that older version, which doesn't comply with the later amendment. Second, as explained in this preamble and the preamble to the NPRM, the starting point of the analysis in determining whether the latest amendments should be applied to an already changed product is the changed product's latest certification basis.

In response to the last comment, the preamble to Notice No. 97–7 referenced a safety benefit resource evaluation guide as part of the draft advisory circular. The guide was developed by the Aviation Rulemaking Advisory Committee, and was included in the draft circular for information purposes only. In consideration of comments received and after further discussion with the ARAC, the FAA has determined that, in theory, a safety benefit resource evaluation guide could be used by the applicant to demonstrate that compliance with the later amendment would be impractical. An

applicant who elects to make a showing using this guide would be required to submit data on potential benefits and costs that would justify compliance with an amendment level in effect before the date of the application for a change. As mentioned earlier, the burden of the initial showing of costs and benefits rests with the applicant. The FAA will consider the analysis along with other factors in its assessment and determination of the appropriate amendment level. A safety benefit resource evaluation guide, therefore, will likely be retained in the final advisory circular as a tool to assist the applicant in developing arguments as to the appropriate certification basis.

The safety benefit resource evaluation guide recommended by the ARAC could not be endorsed as a sole means of determining the amendment level because the process cannot be proven through any rational financial analysis determination. In addition, the guide includes factors that are not relevant in determining applicable regulations. For example, the guide suggested a change to a single production item could be certificated differently than the same change to multiple production items. In determining whether a regulation should apply, the FAA considers the level of safety, not the quantity of production items as the basis.

Comments: AECMA states that few of the changes proposed during the life of a product are really significant and that therefore, it is an administrative burden to require elaboration and documentation of a justification for application of one of the exceptions in § 21.101(b) for each change. This commenter emphasized an established procedure described in the Action Notice A8110.23, ''requiring application of the latest requirements only for changed parts of the product and affected area warranted equivalent results with less bureaucratic burden.''

FAA Response: FAA's Action Notice 8110.23, which was replaced by Order 8110.4, was an interim action intended to move applicants in the direction of the regulations in effect on the date of the application for a change. Neither document has, nor were they intended to have, the regulatory impact of the rule language proposed in Notice No. 97–7. These documents were, however, directed at all derivative aircraft, engines, and propellers where a change is significant, but not so extensive as to require a new type certificate. The action notice and subsequent order applied to all changed products whether the approval method was an amended type certificate or an STC.

Comments: Raytheon states that the intent of the word ''impractical'' in proposed § 21.101(b)(3) ''should be defined as not providing added value (perceived or actual) to the operator, manufacturer, or traveling public, or not achieving the desired effect, as in non-meritorious or ineffectual.'' Raytheon suggests, ''Perhaps impractical could be defined as 'without value enhancement,' to stress that any change required as a result of a new regulation which doesn't result in a value enhancement may, with analytical substantiation, be exempted from compliance.''

FAA Response: There is little, if any, difference between the FAA's explanation of compliance that would not contribute materially to the level of safety and Raytheon's understanding of compliance that would be ''impractical.'' The question of whether compliance with a later regulation would be impractical arises only after it has been determined that compliance with the later regulation would ''contribute materially to the level of safety of the changed product. . . .'' The cost burden introduced by impracticality is considered in relation to the potential safety benefit. In order to show impracticality the applicant considers whether the cost to incorporate the change, plus the cost of the subsequent operation of the changed product, would not be commensurate with the potential increase in safety.

Comments: One commenter states that if an applicant is granted an exception under proposed § 21.101(b)(2) (unaffected areas) it should be subject to mandatory periodic FAA reviews of safety related issues for airplanes that continue in production under the same type certificate. This commenter states that for airplanes that have continued in production for many years and at substantial quantities, the claim of excessive economic burden may be invalid and that a reasonable time period for periodic reviews would be ten years, starting from the date the exception was first granted. The commenter recommends that mandated changes should be incorporated in newly produced airplanes within three years after the review. Furthermore, the FAA should consider expected size of the future market when considering granting an exception for production airplanes.

On the topic of ''impractical'' this commenter believes the concept is acceptable, although balancing safety with economics is not something readily acceptable to the public at large. The commenter states ''cost-effective/not cost-effective'' should be used instead of ''practical/impractical'' since the latter terms are too broad and not descriptive of the concept.

FAA Response: Since the basis for an exception under proposed § 21.101(b)(2) is a finding that the area, system, component, etc. is not affected by the change, the FAA does not agree that there is a need for a periodic review of the ground for the exception, nor does the FAA agree that economic burden is a factor in this determination. With respect to whether compliance with the later regulation would be impractical, the FAA cannot agree that the terms ''cost effective/not cost effective'' would be more descriptive. While costs and benefits stated in dollar terms are essential ingredients, a safety benefit resource analysis involves more than costs.

The benefit-resource analysis is a composite evaluation of four elements that are key to determining the contribution to safety made by meeting a particular rule. The four critical elements are:

(1) The frequency of occurrence of the hazard the rule is intended to mitigate.

(2) The potential severity of the hazard.

(3) How well the configuration being certificated will mitigate the hazard by meeting the rule.

(4) What resources are required if the design must meet the rule. While cost is one element of this evaluation, all four elements must be considered in evaluating the application of a rule. Furthermore, because application of the rule will set appropriate standards for the product design and the design change, the concern of the comment regarding length of production where no design change is proposed is beyond the scope of this rulemaking.

Section 21.101(c) (New)

Section 21.101(c) in this final rule contains the previously mentioned exceptions for aircraft (other than rotorcraft) of 6,000 pounds or less maximum weight, as defined in § 23.25(a), and non-turbine rotorcraft of 3,000 pounds or less maximum weight, as defined in § 27.25(a). Inclusion of these exceptions will address some of the concerns expressed by the aircraft modifiers who commented on Notice No. 97–7.

The primary impact of the exception language in § 21.101(c) will be that the starting point for determining the applicable regulations for a changed product will continue to be, as in current § 21.101, the regulations incorporated by reference in the type certificate, rather than the regulations in effect on the date of application for the change. To ensure that later regulations

are applied when appropriate, § 21.101(c) contains language that allows the administrator ''to designate an amendment to the regulation incorporated by reference that applies to the change and any regulation that the Administrator finds is directly related, unless the Administrator also finds that compliance with that amendment or regulation would not contribute materially to the level of safety of the changed product or would be impractical.''

Thus, as adopted, for the excepted aircraft the starting point for determining the applicable regulations will be the latest certification basis rather than those regulations in effect on the date of application for the change. In this case, the FAA would make the finding that applying later amendments is necessary. The later amendments would not be applied, however, if the Administrator also finds that one of the exceptions applies. This part of the rule, like other regulations, leaves the burden on the applicant to demonstrate that compliance with those later amendments would not contribute materially to the level of safety, or would be impractical. For example, the burden is on an applicant for a pilot certificate to provide the evidence on which the Administrator finds that he or she is qualified to hold a certificate.

Historically FAA and its predecessor agencies have treated light airplanes and small non-turbine rotorcraft differently from other classes of aircraft. Aircraft of 6,000 pounds or less maximum weight and non-turbine rotorcraft of 3,000 pounds or less maximum weight are usually of less complex design than the larger aircraft. In addition design changes to these aircraft usually are of less complexity. Furthermore, the certification requirements for these aircraft are many times less complex than those for larger aircraft. Examples of this are simplified design load criteria and performance requirements.

The exception in § 21.101(c) is premised on the assumption that the lesser complexity of design, design changes, and requirements will allow the FAA Aircraft Certification Office (ACO) to more easily identify the current airworthiness standards appropriate for the areas of the product affected by the proposed change. Nonetheless, § 21.101(c) also allows the applicant to submit data on which the ACO could decide to allow one or more of the exceptions to requiring the latest airworthiness standards.

Most importantly, although the process for determining the appropriate level of safety for these aircraft and rotorcraft will be different from the more complex large aircraft, the final result should be the same. The level of safety for both types will be enhanced because the most appropriate airworthiness standards will be used.

Section 21.101(d)

Section 21.101(d) (proposed § 21.101(c)) retains the provisions of current § 21.101(b)(2) concerning special conditions. This paragraph addresses novel or unusual design features where the Administrator finds that the regulations incorporated by reference in the type certificate do not provide adequate standards. For a product that has a novel or unusual design feature, the applicant must comply with the regulations in effect on the date of the application for the change and any necessary special conditions ''to provide a level of safety equal to that established by the regulations incorporated by reference in the type certificate for the product.'' For consistency with the other proposed changes to § 21.101, this proposed paragraph stated that an applicant for a change must comply with any special conditions, and amendments to those special conditions, if any, that provide a level of safety equal to that established by the regulations in effect on the date of the application for the change.

The provisions of current § 21.101(c), concerning the replacement of reciprocating engines with turbopropeller engines, have been removed because a change of this nature would usually be considered a significant change, and compliance with the regulations in effect on the date of application of the change would, therefore, be required.

Comments: CAA recommends that the words ''established by the regulations'' be replaced with the words ''intended by the regulations.''

FAA Response: The phrase ''intended by the regulations'' is not appropriate rule language. Except for the change from paragraph (c) to paragraph (d) this section is adopted as proposed.

Section 21.101(e)

Section 21.101(e) (proposed § 21.101(d)) sets a limit of five years on an application for a change to a type certificate for a transport category aircraft, and sets a limit of three years on an application for a change to a type certificate for all other products. The durations for these amended or supplemental type certificate applications are the same as those for applications for the corresponding type certificates. If an application for a design change expires, an applicant may file a new application or apply for an extension of the original application as provided in § 21.17(c) and (d).

This section is adopted as proposed, except that paragraph (e)(2) has been clarified. New paragraph (e)(2) allows the applicant to select a new date. The new application date may not precede the date the change is approved by more than the time period established under paragraph (e). For example, a person applies for a change to a transport category airplane in 2000. In 2003, the applicant decides that the project cannot be completed by 2005 (the time period required by paragraph (e)). The applicant, however, decides that the project can be completed by 2007. Under paragraph (e)(2), the applicant may elect 2002 (2007 minus 5 years equals 2002) as the new certification basis date.

Section 21.101(f)

Section 21.101(f) (proposed §§ 21.101(e)(1) and (2)) requires the certification basis for a change to a product certificated under predecessor regulations be established in the same manner as that for a change to a certification basis for a product certificated under parts 23, 25, 27, 29, 31, 33, or 35.

Changes to products type certificated under §§ 21.21 and 21.29 and changes to aircraft type certificated under §§ 21.24, 21.25, 21.27, as well as special classes of aircraft (where regulations from the airworthiness standards listed in Chapter 1 are a part of the certification basis) would be required to comply with the requirements of § 21.101(a).

Comments: Pratt & Whitney Canada states that neither the proposed Canadian regulation nor the related JAA NPA 21–7 contain requirements similar to this proposal and recommends that the FAA consider tasking ARAC to address this issue in the interest of harmonization, if a safety concern exists.

Bombardier and Transport Canada believe extending the applicability of this requirement to restricted category aircraft (§ 21.25) would be contrary to the ARAC recommendation. Bombardier advises that the ARAC proposal excluded this category of aircraft because ''compliance with the 'applicable' regulations (whether earlier or latest) was not required for the original model when justified with the regulating Authority.''

The Aerospace Industries Association (AIA) asserts that § 21.101(f) (proposed § 21.101(e)) contains the same requirements as § 21.101(a). AIA believes these sections ''make no exception for products originally certificated to regulations that existed

prior to the codification of the applicable part(s) of 14 CFR nor for products certificated as restricted, surplus military, or other unique types.'' AIA recommends this proposal be eliminated.

Transport Canada recommends the paragraph be revised in a manner similar to proposed § 21.101(a)(1), which specifically states ''each regulation that is applicable to the changed product.''

FAA Response: The intent of proposed paragraph (e)(1) was to ensure that the predecessor regulations (former CAR's, etc.) would continue to be the starting basis for aircraft that were originally type certificated under earlier regulations. The recodification of the regulations did not remove airworthiness requirements under which products were type certificated. Therefore, the FAA agrees, in part, with AIA in that proposed paragraph (e)(1) is redundant. Proposed paragraph (e)(1) has not been adopted.

However, § 21.101(f)(proposed § 21.101(e)(2)) is still needed to address aircraft type certificated under §§ 21.24, 21.25, 21.27, and special classes of aircraft covered by § 21.17(b). The airworthiness requirements applicable to the category of aircraft in effect on the date of the application for the change must include any airworthiness requirements that the Administrator finds to be appropriate for the type certification of the aircraft in accordance with those sections.

The FAA has determined that some restricted category aircraft should comply with the requirements of this rulemaking action and the reference to § 21.25 has been retained. Although Transport Canada has somewhat comparable ''restricted category'' provisions in their regulations, the JAA have no comparable provisions in their regulations. However, the FAA does certificate some restricted category aircraft using airworthiness standards and has determined that this requirement is needed to ensure that the aircraft certificated using regulations from parts 23, 25, 27, and 29 are included in the rule. The requirements of proposed § 21.101(e)(2) have been revised and retained as § 21.101(f) in the final rule. Due to the revision of § 21.101(f), the language to which Transport Canada referred is no longer in the paragraph.

Section 21.115

A type certificate holder may obtain approval for a change by amending the original type certificate under § 21.101, or by obtaining a supplemental type certificate under § 21.115. Other modifiers must obtain supplemental type certificates under § 21.115. Because the provisions of § 21.115 incorporate by reference the provisions of current § 21.101(a) and (b), the provisions to amend the type certificate are essentially the same as the provisions for supplemental type certificates. To align the provisions of proposed changes to § 21.101 and appropriate references to those changes in proposed § 21.115, the paragraph designators (a) and (b) have been removed.

By deleting the paragraph designators the FAA, in effect, proposed to require applicants for a supplemental type certificate to show that the modified product complies with the applicable regulations in effect on the date of the application for the STC is met.

Comments: Virtually all of the commenters who commented on proposed § 21.115 (including the oral comments from the in-service modifiers represented at the ARAC working group meetings) opposed this proposal and the substantive change proposed in § 21.101(a) that requires that STC applicants make a finding of compliance with later applicable regulations. These commenters recommend no changes to the current requirements for an STC.

FAA Response: As mentioned earlier under the discussions in § 21.101(b), the FAA has provided an exception, in § 21.101(c), for aircraft of 6,000 pounds or less maximum weight and non-turbine rotorcraft of 3,000 pounds or less maximum weight. The primary impact of this exception will be that the starting point for determining the applicable regulations for a changed product will continue to be the regulations incorporated by reference in the type certificate. The administrator may designate an amendment to the regulation incorporated by reference that applies to the change and any regulation that the Administrator finds is directly related, unless the Administrator also finds that compliance with that amendment or regulation would not contribute materially to the level of safety of the changed product or would be impractical.

The exception applies to both amended and supplemental type certificates. This is because there is no legal difference between the number of products that can be modified using an amended type certificate versus using supplemental type certificates.

Section 25.2

Current § 25.2(c) incorporates by reference the provisions of current §§ 21.101(a) and (b) concerning special retroactive requirements applicable to airplanes for which the regulations referenced in the type certificate predate subsequent amendments. Section 25.2(c) has been revised consistent with the changes to § 21.101(a).

Comments: Raytheon believes that §§ 23.2, 27.2, and 29.2 should be amended to use the same language as § 25.2.

FAA Response: Current §§ 23.2, 27.2, and 29.2 do not contain references to § 21.101 no change is needed in these sections.

Paperwork Reduction Act

This rule contains information collections that are subject to review by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. section 3507(d)). As previously stated, comments on the information were not invited at the proposed rule stage and therefore are being invited in this final rule document. The Department of Transportation has submitted the information requirements associated with this rule to the Office of Management and Budget (OMB) for its review. The title, description, and number of respondents, frequency of the collection, and estimate of the annual total reporting and recordkeeping burden are shown below.

Title: Type Certification Procedures for Changed Products.

Summary: This rule will constitute a reporting burden for applicants seeking an amended Type Certificate or a Supplemental Type Certificate for changes to aeronautical products. This rule requires applicants, with some exceptions, to comply with the latest regulations in effect on the date of the application for the design changes of aircraft, aircraft engines, and propellers. Compliance with the latest regulations will not be required:

(1) if the change is not significant,

(2) for those areas or components not affected by the change,

(3) if such compliance would not contribute materially to the level of safety, or

(4) if such compliance would be impractical.

The applicant for most product changes now will incur an additional incremental administrative cost to document an analysis based on the latest certification basis and identify to the FAA those regulations they will or will not be complying with, based on the above four criteria. This analysis is part of the applicant's compliance review document.

Applicants for product changes to non-turbine rotorcraft of 3,000 pounds or less maximum weight, or other aircraft of 6,000 pounds or less would

not necessarily be required to perform this analysis. For such applications, the FAA would make an initial finding to require compliance with appropriate regulations. In that case, the applicant may decide to demonstrate compliance with those regulations, or may perform the analysis to demonstrate that compliance is not warranted.

Use of: Because the rule shifts most of the responsibility from the FAA to the applicant to evaluate and demonstrate the applicable certification basis for product changes, the applicant must produce additional documentation when submitting an application to the FAA. The FAA will review all documentation provided with the amended TC or STC application and determine the certification basis for the changed product.

Respondents: Any individual or business entity desiring to submit an application for a change to a TC or an STC; i.e., a current TC or STC holder, a manufacturer, or a modifier of aeronautical products.

Frequency: Approximately 2,860 applications are received by the FAA annually. Of these, an average of 1,649 applications per year result in certificates being issued. The difference of 1,211 applications per year represents an estimate of the applications that are initiated but are never completed; e.g., withdrawn, canceled, or inactive. The sum of the 1,649 annual applications completed for certification, and 75 percent of the 1,211 applications not completed, equals the administrative equivalent of 2,557 applications per year.

Annual Burden Estimate: The full regulatory evaluation forecasts costs over a 20-year period, beginning in the year 2000, and assumes a 3 percent annual increase in applications. For all applicants, the first year administrative costs of the rule are projected to equal $1,975,530 (1998 present value $1,725,504) divided by an overhead rate of $105 an hour, which equals 18,815 total annual hours.

Using the 1500-employee size standard, small firms are projected to incur 56.6 percent of those costs, equaling $1,118,679 with a 1998 present value of $977,098. The small business proportion of expected administrative costs (56.6 percent) is lower than the proportion of applications expected from small business (62.1 percent) because a significantly higher proportion of the administrative exceptions under the rule are projected for small business applicants. This disproportionate exception rate also causes the average increased administrative cost per small business application ($664) to be smaller than the average for all applicants ($728.)

For the 20-year study period, incremental small business administrative costs under the rule are projected to total $30,059,321 with a 1998 present value of $13,938,179.

The agency solicits public comment on the information collection requirements to:

(1) evaluate whether the collection of information 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 of the collection of information, including the validity of the methodology and assumptions used;

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

(4) minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, (e.g.. permitting electronic submission responses).

Individuals and organizations may submit comments on this information collection requirements by August 7, 2000, and should direct them to the address listed in the **ADDRESSES** section of this document.

Persons are not required to respond to a collection of information unless it displays a currently valid OMB control number. The burden associated with this rule has been submitted to OMB for review. The FAA will publish a notice in the **Federal Register** notifying the public of the approval number.

Information collection requirements to other sections of part 21 have previously been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), and have been assigned OMB Control Number 2120–0018.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable.

The FAA has reviewed corresponding ICAO Standards and Recommended Practices and Joint Aviation Airworthiness Authorities regulations, where they exist, and has identified and discussed similarities and differences in these proposed amendments and foreign regulations.

The final rule results, primarily, from a recommendation harmonized with the aviation authorities of Canada and Europe. Transport Canada and the Joint Aviation Authorities have proposed similar corresponding changes to regulations governing type certification procedures for changed products.

Economic Evaluation, Regulatory Flexibility Determination, International Trade Impact Assessment, and Unfunded Mandates Assessment

Proposed changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980, as amended, requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (19 U.S.C. §§ 2531–2533) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the U.S. And 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 likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation).

In conducting these analyses, the FAA has determined that this rule: (1) would generate benefits that justify its costs; and is ''a significant regulatory action'' under Executive Order 12866 and under the regulatory policies and procedures of the Department of Transportation (44 FR 11034, February 26, 1979), (2) would have a significant economic impact on a substantial number of small entities; (3) would not constitute a barrier to international trade; and (4) does not contain a significant intergovernmental or private sector mandate. These analyses, available in the docket, are summarized below.

Response to Economic Comments

Comment: The Air Transport Association (ATA) and a private aircraft owner both raise due process concerns based on the failure of the FAA to quantify the costs and benefits of the proposal in the Notice of Proposed Rulemaking (NPRM). While the NPRM stated that the FAA was not able to quantify the costs and benefits of this

proposal, the NPRM also stated that the benefits would exceed the costs. In previous rulemakings the FAA was able to justify part 25 amendments applicable to new type designs, but failed to satisfy reasonable cost-benefit criteria essential to making them applicable to derivatives, new production units, or the existing fleet. Based on this, ATA doubts that the benefits of the proposal exceed the costs, and, in general, holds that government should not adopt regulations for which the costs and benefits have not been quantified.

FAA Response: The FAA's assessment that the proposed rule would be cost-beneficial was, and is, based on the provision of the rule that, in the final instance, compliance with later regulations will not be required if such compliance ''. . .would not contribute materially to the level of safety of the changed product or would be impractical.'' In the discussion of this provision, the NPRM further explained that ''compliance with a later amendment would be considered 'impractical' when the applicant can establish that the cost of the design change and related changes necessary to demonstrate compliance with the amendment would not be commensurate with the resultant safety benefit.''

Executive Order 12866, which is the basis for federal regulatory evaluation, explicitly recognizes that costs and benefits may not always be quantifiable. The Order states that, ''costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider.''

Discussion of Costs and Benefits

The costs imposed by the final rule will be incurred by future applicants for amended and supplemental type certificates for aeronautical products. Two categories of costs may be imposed: (1) administrative costs, and (2) the costs of compliance with later regulations.

The final rule will require applicants to comply with the regulations in effect on the date of the application for the change, as compared to the latest certification basis of the product to be changed, unless one of several conditions is met. Compliance with the later set of regulations will not be required:

(1) if the change is not significant,

(2) for those areas or components not affected by the change,

(3) if such compliance would not contribute materially to the level of safety of the changed product, or

(4) if such compliance would be impractical; i.e., would result in costs that would not be commensurate with the safety benefit that would be derived.

Applicants for changes to most products would incur the incremental administrative cost of evaluating and demonstrating to the FAA the applicability of these four conditions to their product changes. The final rule, unlike the proposed rule, would make an exception to this administrative responsibility for applicants for changes to either: (1) non-turbine rotorcraft of 3,000 pounds or less maximum weight, or (2) other aircraft of 6,000 pounds or less. For such applications, the FAA would maintain the administrative responsibility of demonstrating that the certification basis for a changed product should incorporate the latest airworthiness standards.

Survey Methodology

The evaluation of this rule was based on a sample of records from the FAA's Aircraft Certification Office Subsystem (ACOS) database. The ACOS system is used to track FAA certification projects at the individual certification office level. All pertinent (amended and supplemental) certification actions, where the date of application was 1994 or later, were selected and combined into a single database. That filter resulted in a set of 13,448 project records, from which, a random sample of 250 project records were selected for detailed review and analysis. These sample project records were then used to forecast the expected distribution of characteristics for future amended and supplemental certification actions under the final rule.

The 250 sample project records were evaluated by a team of field-experienced FAA certification employees. Based on the data provided for each project in the sample, the review team assessed the following five areas for each sample record:

1. Categorized the number of employees in the firm submitting each application. This information was used to evaluate the potential effects of the rule on small entities.

2. Assessed the weight and type of the affected aeronautical product in order to estimate the proportion of applications that would fall within the final rule's specified exceptions for certain small aircraft.

3. Estimated the existing administrative effort for each application under current procedures.

4. Estimated the incremental administrative work that would be caused by the final rule. The review team also estimated the additional administrative work for those applications that would actually be excepted by the rule's small-aircraft provision. These estimates were needed to measure the amount of relief that would be afforded by this exception.

5. Estimated the proportional split between the certification projects that would and would not be required to meet later regulations. For those projects that would not be required to meet later requirements, the responses were used to measure the distribution of conditions that would lead to that determination. Conversely, for those projects that would be required to meet later regulations, these responses were used to categorize the relative cost impact of meeting those regulations.

For 227 of the 250 sample project applications, the ACOS data system contained sufficient information for the FAA review team to estimate answers for the five-part evaluations described above. Insufficient data were available to assess the remaining 23 project records, which were removed and were not considered further.

Costs

The following procedure was used to estimate the administrative costs of the rule. First, the sample data were tabulated to determine the proportional distributions of results for each item area in the sample. This distribution for the sample project applications was then expanded to represent the characteristics that would be expected for all affected applications in a year. The ACOS data show that an average of 2,860 applications for amended or supplemental type certificates are received into the system each year. Of these, an average of 1,649 applications per year result in certificates being issued. The difference of 1,211 applications per year represents an estimate of the applications that are initiated but are never completed; e.g., withdrawn, canceled, or inactive.

The regulatory evaluation assumes that the additional administrative efforts caused by the final rule would apply to all projects that are completed, and that 75 percent of that additional administrative effort would actually take place for the ''never completed'' projects. The sum of the 1,649 annual applications completed for certification, and 75 percent of the 1,211 applications not completed, equals the administrative equivalent of 2,557 applications per year. The projected numbers of applications, by category,

were then computed by multiplying the percentage distributions of the sample data by this administrative equivalent of 2,557 applications per year.

Next, the annual increased hours of administrative work that will be caused by the rule was computed by multiplying the matrix of 2,557 applications by the respective average increases in administrative hours per application, as determined from the review team evaluations of Item 4. This methodology projects that the rule will impose a total additional 17,218 applicant hours of administrative work per year. By comparison, the rule's exception provision for small aircraft applications is projected to preclude an additional 3,985 hours of applicant administration from being imposed.

The increased annual administrative costs of the rule were then computed by multiplying the incremental administrative hours, from above, by a unit cost factor of $105 per hour. This factor is intended to be a representative, fully burdened labor rate for the highest skill level necessary to make and support the determinations called for under the rule. These calculations project a base annual administrative burden of approximately $1.8 million.

The administrative costs of the rule were then projected over a 20-year study period. For computational simplicity, all administrative costs were assumed to begin in the year 2000, even though the effective date of the rule will vary by product type. The computations assumed an annual 3 percent increase in certification applications, and accordingly, a 3 percent annual increase in attributable costs. The initial year 2000 cost was computed from the $1.8 million base annual administrative burden described above and inflated at 3 percent annually from 1997 to the year 2000. These calculations predict that the 20-year administrative costs of the rule will total $53.1 million, with a 1998 present value of $24.6 million. Parallel calculations were made for the costs that will be excepted under the rule's provision for certain small aircraft. This exception will preclude an estimated $12.3 million in applicant administrative costs over the study period, with a 1998 present value of $5.7 million.

In addition to the administrative costs detailed above, additional costs will be imposed by the rule's conditional requirements for compliance with later certification regulations. It is important to note that the final rule's exception for small aircraft only applies to the administrative burden of proof under the rule. Accordingly, applications that are excepted from the rule's incremental administrative costs may still incur the incremental costs of complying with later, and likely more stringent, regulations.

A second important difference between the calculations for administrative costs versus compliance costs concerns the base number of affected applications. The previous computations of administrative costs included a proportion (75 percent) of those applications that were never finalized, and where no amended or supplemental type certificate was issued. By comparison, any additional compliance requirements resulting from this rule would only apply in situations where an amended or supplemental type certificate is actually issued. As such, the compliance cost calculations are based on the average 1,649 amended and supplemental certificates issued each year, as reported from the ACOS data. Using this base number, the annual numbers of certifications that would be subject to the rule over the 20-year study period were forecast, based on a 3 percent growth rate.

The expected annual numbers of certification projects that would have to meet later regulations were estimated from the sample results. Item 5 from the team evaluation areas assessed the simulated effect of the rule on the certification basis of each sample project. The percentage distribution of that assessment follows.

	Percent of samples
Rule would not invoke later regulations:	
Change would be not significant	49.3
Change would not contribute materially to safety or would be impractical	9.7
Rule would invoke later regulations:	
Compliance costs would increase less than 10%	36.1
Compliance costs would increase 10%–25%	3.5
Compliance costs would increase over 25%	1.3
Total	100.0

This regulatory evaluation uses the three compliance impact level percentages to project the annual numbers of applications where later regulations would be invoked and additional compliance costs could result. Separate estimates were made for each of the three ranges of compliance impact. This procedure projected that, in the first year, cost increases of less than 10 percent would result from applying later regulations to 651 certification projects. Similarly, 64 projects were projected to incur cost increases of 11 to 25 percent, and 24 projects would have cost increases of over 25 percent. Annual impact estimates were projected over the entire study period through the year 2019, again assuming a 3 percent growth.

It would be informative to have more detailed compliance impact estimates than the broad categorizations of relative percentages that were possible using the sample review methodology employed in this evaluation. However, the scope of projects that will be affected by this rule is wide, and reliable measures of the sample project production levels were not available for this evaluation. Therefore, in an effort to provide useful information, without portraying a higher degree of confidence than is supportable, estimates were made of the future annual compliance cost impacts of the rule per assumed $100,000 unit of project size. This assumed average project size is a direct factor to the resulting projected compliance costs, and alternate assumptions are readily calculable.

While this analysis uses a compliance cost of $100,000 for a single project, the FAA believes there is a wide range of compliance costs. For example:

1. *A $100 thousand dollar project.* An emergency medical service system for a helicopter over 3,000 pounds. This modification includes a litter/restraint system, medical equipment (oxygen, ventilator, air pump, defibrillator, etc.), and an auxiliary electrical system.

2. *A $20 to $50 thousand dollar project.* An improved stainless steel exhaust system for a twin-engine general aviation aircraft.

3. *A $15 thousand dollar project.* The purchase and installation of an avionics instrument system. For a simple sensitivity test, the compliance cost estimate is directly related to changes in the assumed $100,000 compliance cost per project. If, for example, the project cost for small business is better represented by $20,000, then the compliance cost estimates should be reduced by 80 percent.

The unit-project-size cost estimates were computed as the product of: (1) the relevant number of annually affected projects described above, (2) an assumed median value for the percentage impact ranges at each of the three impact levels, and (3) the assumed $100,000 unit project size. For example, the year 2000 cost estimate for projects in the less-than-10-percent cost impact category was computed as the product of:

(1) the projected 651 affected projects from Table 7,

(2) an assumed mid-range cost impact of 5 percent, and

(3) the assumed unit project level of $100,000.

This subcalculation produces a cost impact estimate of $3,255,000 for projects in the ''less-than-10-percent'' cost impact category in the year 2000, as shown in Table 8. When applied to all 3 cost impact categories, and summed, this methodology produces an annual compliance cost impact of $4.8 million in the year 2000. Total twenty-year compliance costs, at the $100,000 unit project level, are projected to equal $128.0 million, with a 1998 present value of $59.4 million.

In summary, the 20-year administrative costs of the rule are projected to total $53.1 million, with a 1998 present value of $24.6 million. Parallel compliance costs, assuming a $100,000 unit project level, equal $128.0 million, with a 1998 present value of $59.4 million. An additional $12.3 million ($5.7 million, 1998 present value) in applicant administration costs will be averted by the small-aircraft exception provision in the rule.

Benefits

The directly attributable benefit of this final rule is the augmented safety that will result in those cases where future changed products will be required to comply with later, more stringent airworthiness standards than those that would be required in the absence of this rule. These benefits cannot be accurately predicted and quantified, but the rule includes provisions to assure that any actions taken pursuant to it will be cost-beneficial.

The benefits of amendments to the airworthiness standards are evaluated at the time of those amendments. Some amendments are based on the FAA's evaluation of accidents or incidents; other amendments are based on the FAA's evaluation of probable or likely safety problems that may not be attributable to a specific accident. The changed products rule is FAA's proactive approach to addressing safety issues before they arise. The FAA does not have to wait for an accident to justify a rule.

As noted previously, the rule will require compliance with all later regulations where such compliance will contribute materially to the level of safety. The rule will not require compliance with later regulations: (1) if the change in the aeronautical product is not significant, (2) for those areas or components of the product not affected by the change, (3) if such compliance would not contribute materially to the level of safety of the changed product, (4) or in the final analysis, if such compliance would be impractical. Compliance with later regulations will be considered impractical if the applicant can show that such compliance would result in costs that are not consistent with the possible safety benefits. Since each action taken under the rule will be cost-beneficial, the FAA has determined that the benefits of the rule will justify its costs.

Smaller Aircraft Exception Provision

The exception in § 21.101 for non-turbine rotorcraft under 3000 pounds and for other aircraft under 6000 pounds places the burden on the FAA to make an initial determination whether or not to require the applicant to demonstrate compliance with a later airworthiness standard. The certification basis for the change could be approved in several ways:

(a) If the FAA determines that no later regulation is to be applied, the applicant would demonstrate compliance with the existing certification basis, and there would be *no administrative or compliance costs* associated with application of this changed products rule.

(b) If the FAA determines that a later regulation is to be applied, the applicant can accept that determination, and, while there would be *compliance costs* associated with accepting the FAA determination, there would be *no administrative costs.*

(c) If the FAA determines that a later regulation is to be applied, the applicant could submit a technical analysis to demonstrate that, for example, compliance with the later regulation would be impractical or would not contribute materially to the level of safety of the product. In that case—

(1) If the FAA agrees with the applicant's technical analysis, the applicant would demonstrate compliance with the existing certification basis, and, while there would be *no compliance costs,* there would be *administrative costs.*

(2) If the FAA does not agree with the applicant's technical analysis, the applicant would demonstrate compliance with the later regulation, and there would be resultant *administrative and compliance costs.*

Thus, in practice, the total costs to applicants for changes to the smaller aircraft could be a combination of ''no costs'' (scenario ''(a)'' above), compliance costs only (scenario ''(b)'' above), administrative costs only (scenario ''(c)(1)'' above), and compliance and administrative costs (scenario ''(c)(2)'' above). The calculations in this regulatory analysis are based on the assumption that, if the FAA determines that a later regulation should apply, the applicant will demonstrate compliance with the later regulation, and will not attempt to demonstrate that one of the exceptions in § 21.101 applies, e.g., that compliance with the later regulation would be impractical or would not contribute materially to the level of safety.

However, one needs to consider the following. The applicant will make their own educated determination as to the applicability of the later regulation, and will decide to accept compliance with that regulation only when they are relatively certain that the administrative costs of demonstrating that one of the § 21.101 exceptions applies and will exceed the costs of demonstrating compliance with the later regulation. Thus, this regulatory analysis somewhat over-estimates total compliance costs in that it assumes that applicants will *always* forego their opportunities to convince the FAA that compliance with the later regulation would be impractical or would not contribute materially to the level of safety. By the same token, that assumption results, somewhat, in an under-estimation of the total administrative costs. Only when an applicant has decided that compliance costs are likely to actually exceed administrative costs, will the applicant choose to expend the resources to make the ''impracticality,'' ''contribution to safety,'' or other arguments. Furthermore, an applicant is more likely to choose to make those arguments when there is a persuasive technical foundation for them. Therefore, this regulatory analysis over-estimates compliance costs by including those costs that would tend to be avoided by the more efficient expenditure of administrative resources. And, by the same token, the administrative costs that are ''unaccounted for'' due to the above under-estimation are more likely to be spent in realistic efforts to avoid even higher compliance costs. The net effect is that this regulatory evaluation over-estimates total costs.

Regulatory Flexibility Analysis

The Regulatory Flexibility Act of 1980 (5 U.S.C. 601–612) establishes, ''as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation.'' To achieve that principle,

the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination finds that it will, the agency must prepare a regulatory flexibility analysis (RFA) as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 act provides that the head of the agency may so certify, and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

Recently, the Office of Advocacy of the Small Business Administration (SBA) published new guidance for Federal agencies responding to the requirements of the Small Business Regulatory Enforcement Act of 1996. Following the SBA guidance, the FAA conducted the required review of this rule and determined that, based on the cost assumptions described above, it will have a significant impact on a substantial number of small entities. Accordingly, a full regulatory flexibility analysis was conducted and is summarized as follows.

1. A Description of The Reasons Why Action By The Agency Is Being Considered

In recent years, a trend has developed toward fewer products that are of completely new designs, which would require new type certificates. Over a period of time, a series of changes to an original product may have been made so that the current model is considerably different from the original model. Although each changed product in such a series of changes may differ little from its immediate predecessor, the collective changes can result in a product with substantial differences from the original product.

Another trend in manufacturing is to keep products in production over several decades. Some currently manufactured airplanes have evolved from airplane models originally type-certificated 25 years ago. This does not imply that those airplanes are unsafe, because they do, in practice, have features that address the intent of most of the current airworthiness standards. However, current procedural regulations (part 21) do not require that changed products demonstrate compliance with all current airworthiness standards.

The FAA maintains that the issue should not be whether a product is produced under a new type certificate or an amended one, or changed under a supplemental type certificate. Nor should the certification basis of a changed product turn on the fact that the product is to be modified or initially operated by a small (as opposed to a large) entity. The issue is whether or not the level of safety of the product, embodied in the airworthiness standards it complies with, is as high as practical.

2. A Succinct Statement of The Objectives Of, and Legal Basis For, The Proposed Rule

The objective of this rule is to enhance safety by applying the latest airworthiness standards, to the greatest extent practical, for the certification of significant design changes to aircraft, aircraft engines, and propellers.

The legal basis for the rule derives from Title 49, U.S.C. 44701 which authorizes the FAA Administrator to promote safety of flight of civil aircraft in air commerce by prescribing, in part, minimum standards governing the design and construction of aircraft, aircraft engines, and propellers, as may be required in the interest of safety. Under 49 U.S.C. § 44704, the FAA may issue type certificates, including supplemental type certificates, for aircraft, aircraft engines, and propellers.

3. A Description of The Projected Reporting, Recordkeeping and Other Compliance Requirements of The Proposed Rule, Including an Estimate of The Classes or Types of Small Entities That Will Be Subject to The Requirement and The Type of Professional Skills Necessary For Preparation of The Report or Record

As detailed previously in the regulatory evaluation, the requirements imposed by this rule will affect future applicants for amended and supplemental type certificates for changed aeronautical products. The rule will impose both administrative requirements (with certain exceptions) and compliance requirements. It will require applicants to comply with the regulations in effect on the date of the application for the change, as compared to the latest certification basis of the product to be changed, unless one of several conditions is met. Compliance with the later set of regulations will not be required: (1) if the change is not significant, (2) for those areas or components not affected by the change, (3) if such compliance would not contribute materially to the level of safety of the changed product, or (4) if such compliance would be impractical; i.e., would result in costs that would not be commensurate with the safety benefit that would be derived.

Applicants for changes to most products would need to evaluate and demonstrate to the FAA the applicability of these four conditions to their product changes, if compliance to regulations other than the most current is to be required. The skill level necessary to make these determinations will vary widely with the scale and engineering complexity of the individual product change involved. In general, these skills would include a working knowledge of the pertinent aviation regulations, the ability to evaluate and approve technical data, and a combination of training and responsible experience in the field or fields of engineering pertinent to the product change. In assessing the administrative costs of this rule, the regulatory evaluation assumes a fully burdened labor rate of $105 per hour for the highest skill level necessary to make and support the determinations called for under the rule.

4. An Identification, to The Extent Practicable, of All Relevant Federal Rules That May Duplicate, Overlap, or Conflict With The Rule

The FAA is unaware of any federal rules that would duplicate, overlap, or conflict with the final rule.

5. A Description and An Estimate of The Number of Small Entities To Which The Rule Will Apply

This rule will apply to future applicants for amended and supplemental type certificates for changed aeronautical products. FAA regulations are typically directed toward some closely identified industry or occupation; such as domestic air carriers or private pilots. By comparison, the applicants under this rule are not uniquely defined, and may be found in a wide variety of industries. In assessing this rule, the FAA identified 63 industry groups in 19 different four-digit standard industrial classifications (SIC) that would reasonably include applicants for certifications to changed aeronautical products. These industries are listed as Table 9 of the appendix to the full regulatory evaluation.

The Small Business Administration (SBA) provides descriptive national data for the year 1995 on U.S. firms, aggregated at the four-digit SIC level.

These data include the numbers of firms, numbers of establishments, employment, annual payroll, and estimated receipts by employment size of firm. Information for the 19 industry classifications identified under this rule were combined to produce the following distributions.

Number of employees	Percent of firms	Annual receipts per employee ($1,000's)
1—99	83.2	148.0
100—499	8.0	163.9
500 or more	8.8	207.6
Total	100.0	Avg: 200.1

The SBA also provides small business size standards for each industry. The 19 industry groups that could include firms affected under this rule fall into four separate SBA standards for small business definition: 500, 750, 1000, or 1500 employees. As part of the evaluation for this rule, the FAA analyzed the employment size of firms for a random sample of 227 supplemental and amended type certification projects. The size distribution of these samples is presented below.

Number of employees	Percent of samples	Cumulative percent of samples
1—100	44.1	44.1
101—500	12.3	56.4
501—750	2.6	59.0
751—1000	1.8	60.8
1001—1500	1.3	62.1
1501 or more	37.9	100.0
Total	100.00	.....

As presented in the table, depending on which size standard is applied, between 56.4 percent to 62.1 percent of the changed-product applications that would be affected by this rule will be submitted by small businesses. To simplify discussion, the remainder of this analysis is based on the 62.1 percent proportion and uses the under 1500-employee size standard. As estimated in the full regulatory evaluation, the FAA expects the administrative equivalent of 2,557 applications will be submitted each year, and 1,588 of those would be from small firms.

The final rule, unlike the original rule, includes an administrative exception for applications related to certain small aircraft. Based on the sample of projects that were analyzed for this rule, 16.7 percent of all applications would fall under this exception, and 97.4 percent of the excepted applications would be submitted by small firms. An estimated 417 of the total annual 1,588 small-business applications would qualify for this exception, and the remaining 1,171 would not.

In addition to the administrative requirements for applications that are submitted, the rule will also invoke certain regulatory compliance requirements for the proportion of applications that are completed and certificated. Some 1,649 of the total applications are completed annually as amended or supplemental type certificates and would be subject to the rule's compliance provisions. Of these, an estimated 1,024 will be from small firms.

Regulatory Flexibility Cost Analysis

The full regulatory evaluation forecasted costs over a 20-year period, beginning in the year 2000, and assumed a three-percent annual increase in applications. For all applicants, the first year administrative costs of the rule are projected to equal $1,975,530 (1998 present value $1,725,504). Using the 1500-employee size standard, small firms are projected to incur 56.6 percent of those costs, equaling $1,118,679 with a 1998 present value of $977,098. The small business proportion of expected administrative costs (56.6 percent) is lower than the proportion of applications expected from small business (62.1 percent) because a significantly higher proportion of the administrative exceptions under the rule are projected for small business applicants. This disproportionate exception rate also causes the average increased administrative cost per small business application ($664) [1] to be smaller than the average for all applicants ($728.) For the 20-year study period, incremental small business administrative costs under the rule are projected to total $30,059,321 with a 1998 present value of $13,938,179.

The regulatory evaluation also details the incremental costs expected under the rule for compliance with later regulations. Based on the evaluation of sample applications, 48 percent of the future certifications from small business firms would be required to meet some measure of additional later regulations. This proportion is higher than the parallel figure of 41 per cent for applications from all firms.[2] In turn, this higher incidence rate also produces higher small business costs per certification action *if it* is assumed that the scale and complexity of small business and large business certification projects are the same. In the absence of reliable project size estimates, the regulatory evaluation has employed a uniform $100,000 project size as a unit factor to facilitate decision-making. However, the FAA does not believe that the projects submitted by small and large businesses are typically equal in scale and complexity.

While this analysis uses a compliance cost of $100,000 for a single project, the FAA believes there is a wide range of compliance costs. For example:

1. *A $100 thousand dollar project.* An emergency medical service system for a helicopter over 3,000 pounds. This modification includes a litter/restraint system, medical equipment (oxygen, ventilator, air pump, defibrillator, etc.), and an auxiliary electrical system.

2. *A $20 to $50 thousand dollar project.* An improved stainless steel exhaust system for a twin-engine general aviation aircraft.

3. *A $15 thousand dollar project.* The purchase and installation of an avionics instrument system. For a simple sensitivity test, the compliance cost estimate is directly related to changes in the assumed $100,000 compliance cost per project. If, for example, the project cost for small business is better represented by $20,000, then the compliance cost estimates should be reduced by 80 percent.

With the above sensitivity test in mind and using the $100,000 project size cost, small business applications are expected to incur a year 2000 compliance cost of $3,582,317 (with a 1998 present value of $3,128,934).[3] This represents an average increase of $3,198 per project, assuming a unit $100,000 base project size.[4] Over the twenty-year study period, small business compliance costs under this scenario are projected to total $96,006,280 (with a 1998 present value of $44,532,108).

Affordability Analysis

If the assumed $100,000 unit of project size is also assumed to be the average size for a small-business project,

[1] Note that these are average costs per application, not per affected application. Based on the sample, 36 percent of all small business applications would meet the ''small aircraft'' exception under the rule and incur no incremental administrative costs.

[2] Note that the ''small aircraft'' exception under the rule will not alter compliance decisions nor alleviate their costs.

[3] For computational simplicity, the regulatory evaluation overstates initial annual compliance costs by assuming that all such costs would occur in the year that the project is approved. In reality, they would occur over several years.

[4] Aircraft operators or modifiers typically do not amortize the incremental cost of $3,200 for a modification totaling $100,000 or more.

the increased administrative cost per project ($664) can be added to the increased compliance cost per project ($3,198) to provide an expected average increase of $3,862 per project. The relative effect of these costs per small firm is a function of: (1) the size (receipts) of that firm, and (2) the number of project applications that a firm submits/completes per year.[5] The following table presents the average impact of the rule as a percentage of a firm's annual receipts, for various assumptions on firm size and annual number of projects. For example, a firm with 5 projects per year would incur additional costs of 5 times $3,862; or $19,310 for the year. If that firm employs 10 people, with each employee producing an average $148,000 of receipts per year (from the ''annual receipts per employee'' factors reported above in paragraph 5) the firm's total receipts would equal $1.48 million. For this example combination of employees and projects, the $19,310 one-year impact of the rule would equal 1.30 percent of the $1.48 million estimated annual receipts of the firm. As a matter of context, it should be noted that FAA analysis of the ACOS data shows that 52 percent of applications were submitted by firms that only submitted one application in that year.

AVERAGE IMPACT OF RULE AS A PERCENTAGE OF ANNUAL RECEIPTS

Employees	Annual No. of projects		
	1	5	10
10	0.26%	1.30%	2.61%
100	0.02%	0.12%	0.24%
1000	0.00%	0.01%	0.02%

Disproportionality Analysis

As discussed in the cost and affordability analyses above, a higher proportion of total certification applications is received from small businesses (62.1 percent) than from large businesses (37.9 percent). This is not surprising given the relative proportions of numbers of small and large businesses. By comparison, the small business proportion of expected administrative costs (56.6 percent) will be lower than the proportion of applications expected from small businesses (62.1 percent) because a significantly higher proportion of the administrative exceptions under the rule are projected for small business applicants. By comparison, the sample survey assessment predicts that small business applicants will disproportionately incur the additional costs of complying with later regulations as a result of the rule. The sample survey predicts that the rule will require 48 percent of small business applications, as compared to 29 percent of large business applications, to comply with later regulations.

Competitiveness Analysis

As discussed above, it appears that there will be proportionally higher compliance costs imposed by the rule on small than on large businesses. This information is not sufficient, however, to determine the impact of the competitiveness of small business vis-a-vis large entities. There is a wide divergence in the characteristics and ultimate consumer of products. There is a fundamental difference among large, fixed-wing commercial aviation, general aviation, and rotorcraft. Also, the products that are produced by the companies that are subject to the rule are not homogeneous. The wide range of products that would be certificated under this rule includes major aircraft components such as wings, diversely unique avionics, and small subassemblies such as seat fasteners. Also, many of the larger companies in this field are assemblers of products that often are produced by small companies. As such, the large companies may be customers rather than competitors to the affected small companies.

Business Closure Analysis

The FAA believes that the average impact of the rule gauged by the cost of the rule per year relative to an affected firm's average annual receipts is likely to be low. In cases where the potential costs would be prohibitive, firms may decide not to proceed with the intended change. This would prevent cash flow problems, losses, and business closure in the short run. However, a series of decisions not to certify new products could affect long run business viability. Based on the sample of 250 applications analyzed by the FAA, the agency believes that the vast majority of applications would not impose high enough compliance costs to threaten business closure of small business.

Description of Alternatives

Three primary alternatives were considered in crafting this rule. The first would be to take no new rulemaking action and to retain the changed-product certification process as it now exists. The FAA opposes this alternative because it would not address the problem whereby a series of cumulative changes can result in a model that is substantially different from the original model, yet that product is not required to demonstrate compliance with all the recent airworthiness standards.

The second evident alternative would be to retain the existing certification process for changes to small aircraft, since the bulk of these applications are submitted by small firms. Again, the FAA opposes this alternative since it would leave the existing problem for a segment of the industry and would create an unacceptable inequity across aircraft model sizes.

As an alternative to full exclusion from the rule, the FAA has included a small-aircraft exception for the administrative responsibilities of the final rule, but not for its compliance provisions. This exception was specifically added to address small business concerns that arose from the proposed rule. The exception will apply to applicants for changes to either: (1) non-turbine rotorcraft of 3,000 pounds or less maximum weight, or (2) other aircraft of 6,000 pounds or less. For changes to such products, the FAA (i.e., the Aircraft Certification Office (ACO) processing the application) may make an initial determination that one or more later airworthiness standards should be part of the certification basis of the changed product. If the ACO makes that determination, the applicant may submit technical analyses to convince the ACO that compliance with the later regulation(s) would be impractical or would not contribute materially to the level of safety of the product. However, as discussed previously in this summary, the regulatory analysis makes the conservative assumption that the applicant will forgo the administrative costs of those technical analyses and incur the compliance costs (estimated to be twice that of administrative costs) attributable to the later regulation(s).

Based on the sample survey, 16.7 percent of all project applications would qualify for this exception, and 97.4 percent of the excepted applications would come from small firms (fewer than 1500 employees). In point of fact, 81.6 percent of the exceptions would go to firms with less than 100 employees.

The value of applicant costs that will be averted by the small-aircraft exception is detailed in the full regulatory evaluation. The expected value of all exceptions in the first year of the rule (year 2000) is calculated at $457,224. Over the 20-year study period, the value of exceptions totals to $12.3 million with a 1998 present value of $5.7 million. Again, over 97 percent of this relief will go to small businesses.

[5] FAA analysis of the ACOS data shows that 52% of applications were submitted by firms that only submitted one application in that year.

The small-aircraft exception provision is predicted to reduce the rule's administrative burden on small businesses by 27.6 percent from the level that would exist without it. The total small business cost burden (administrative and compliance costs) will be 6 percent lower as a result of this exception.

Other alternatives were considered, but were determined not to be practicable. These included (1) requiring applicants for changes to comply with the latest regulations, with no exceptions; and (2) requiring a complete recertification at certain intervals (10 years).

Compliance Assistance

The FAA will issue an advisory circular based on this rulemaking. The circular will provide examples and guidance for determining the certification basis of changed aeronautical products. Small businesses and other applicants may follow this guidance in developing their own arguments as to the appropriate certification basis of their changed products. The circular will be available from the FAA's aircraft certification offices and through the FAA website.

The agency intends to use a variety of additional mechanisms to inform applicants and industry trade associations of the rule change and to explain the new procedures. The FAA will serve copies of this final rule document, with the Regulatory Evaluation Summary, on trade associations that represent most of the small entities affected by this rule. The FAA also will utilize its directorate newsletters to inform industry. The agency will present information on the new rule at industry and FAA designee meetings. In addition, a training video and instructional materials are being developed that will introduce the new rule and explain the respective roles of applicants and FAA personnel. These products will also be available to small businesses through the aircraft certification offices.

International Trade Impact Assessment

The provisions of this rule promote international trade for U.S. firms doing business in foreign countries and foreign firms doing business in the United States. The final rule results, primarily, from a recommendation harmonized with the aviation authorities of Canada and Europe. Transport Canada and the Joint Aviation Authorities have proposed similar corresponding changes to regulations governing type certification procedures for changed products.

The Trade Agreements Act (19 U.S.C. 2531–2533) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the U.S. This final rule imposes additional safety requirements for aviation products that are registered in the U.S. Thus, this final rule does not create any unnecessary obstacles to the foreign commerce of the U.S.

Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), codified as 2 U.S.C. 1501–1571, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in expenditures by State, local, and tribal governments, in the aggregate, or by the private sector of $100 million or more (adjusted annually for inflation) in any one year.

This rule does not meet the thresholds of the Act. Therefore, the requirements of Title II of the Act do not apply.

Executive Order 13132, Federalism

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

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment or environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this rulemaking action qualifies for a categorical exclusion.

Energy Impact

The energy impact of the rule has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) Pub. L. 94–163, as amended (42 U.S.C. 6362). It has been determined that it is not a major regulatory action under the provisions of the EPCA.

List of Subjects

14 CFR Part 11

Administrative practices and procedures reporting

14 CFR Part 21

Aircraft, Aviation safety, Safety, Type certification

14 CFR Part 25

Aircraft, Aviation safety, Safety, Type certification

Adoption of Amendments

Accordingly, the FAA amends parts 11, 21, and 25, Chapter 1 of Title 14, Code of Federal Regulations, as follows:

PART 11—GENERAL RULEMAKING PROCEDURES

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

Authority: 49 U.S.C. 106(g), 40101, 40103, 40105, 40109, 40113, 44110, 44502, 44701–44702, 44711, 46102.

2. Section 11.11 is amended by removing the first sentence and adding two sentences, in its place, to read as follows:

§ 11.11 Docket.

Official FAA records relating to rulemaking actions are maintained in current docket form in the Office of the Chief Counsel. These records include: Proposals, notices of proposed rulemaking, written material received in response to notices, petitions for rulemaking and exemptions, written material received in response to summaries of petitions for rulemaking and exemptions, petitions for rehearing or reconsideration, petitions for modification or revocation, notices denying petitions for rulemaking, notices granting or denying exemptions, summaries required to be published under § 11.27, special conditions required as prescribed under §§ 21.16 or 21.101(d) of this chapter, written material received in response to published special conditions, reports of proceedings conducted under § 11.47, notices denying proposals, and final rules or orders. * * *

PART 21—CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS

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

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

4. Section 21.19 is revised to read as follows:

§ 21.19 Changes requiring a new type certificate.

Each person who proposes to change a product must apply for a new type certificate if the Administrator finds that

the proposed change in design, power, thrust, or weight is so extensive that a substantially complete investigation of compliance with the applicable regulations is required.

5. Section 21.101 is revised to read as follows:

§ 21.101 Designation of applicable regulations.

(a) An applicant for a change to a type certificate must show that the changed product complies 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 and 36 of this chapter. Exceptions are detailed in paragraphs (b) and (c) of this section.

(b) If paragraphs (b)(1), (2), or (3) of this section apply, an applicant may show that the changed product complies with an earlier amendment of a regulation required by paragraph (a) of this section, and of any other regulation the Administrator finds is directly related. However, the earlier amended regulation may not precede either the corresponding regulation incorporated by reference in the type certificate, or any regulation in §§ 23.2, 25.2, 27.2, or 29.2 of this chapter that is related to the change. The applicant may show compliance with an earlier amendment of a regulation for any of the following:

(1) A change that the Administrator finds not to be significant. In determining whether a specific change is significant, the Administrator considers the change in context with all previous relevant design changes and all related revisions to the applicable regulations incorporated in the type certificate for the product. Changes that meet one of the following criteria are automatically considered significant:

(i) The general configuration or the principles of construction are not retained.

(ii) The assumptions used for certification of the product to be changed do not remain valid.

(2) Each area, system, component, equipment, or appliance that the Administrator finds is not affected by the change.

(3) Each area, system, component, equipment, or appliance that is affected by the change, for which the Administrator finds that compliance with a regulation described in paragraph (a) of this section would not contribute materially to the level of safety of the changed product or would be impractical.

(c) An applicant for a change to an aircraft (other than a rotorcraft) of 6,000 pounds or less maximum weight, or to a non-turbine rotorcraft of 3,000 pounds or less maximum weight may show that the changed product complies with the regulations incorporated by reference in the type certificate. However, if the Administrator finds that the change is significant in an area, the Administrator may designate compliance with an amendment to the regulation incorporated by reference in the type certificate that applies to the change and any regulation that the Administrator finds is directly related, unless the Administrator also finds that compliance with that amendment or regulation would not contribute materially to the level of safety of the changed product or would be impractical.

(d) If the Administrator finds that the regulations in effect on the date of the application for the change do not provide adequate standards with respect to the proposed change because of a novel or unusual design feature, the applicant must also comply with special conditions, and amendments to those special conditions, prescribed under the provisions of § 21.16, to provide a level of safety equal to that established by the regulations in effect on the date of the application for the change.

(e) An application for a change to a type certificate for a transport category aircraft is effective for 5 years, and an application for a change to any other type certificate is effective for 3 years. If the change has not been approved, or if it is clear that it will not be approved under the time limit established under this paragraph, the applicant may do either of the following:

(1) File a new application for a change to the type certificate and comply with all the provisions of paragraph (a) of this section applicable to an original application for a change.

(2) File for an extension of the original application and comply with the provisions of paragraph (a) of this section. The applicant must then select a new application date. The new application date may not precede the date the change is approved by more than the time period established under this paragraph (e).

(f) For aircraft certificated under §§ 21.17(b), 21.24, 21.25, and 21.27 the airworthiness requirements applicable to the category of the product in effect on the date of the application for the change include each airworthiness requirement that the Administrator finds to be appropriate for the type certification of the aircraft in accordance with those sections.

6. Section 21.115 is amended 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, 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 and, in the case of an emissions change described in § 21.93(c), show compliance with the applicable fuel venting and exhaust emissions requirements of part 34 of this chapter.

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PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

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

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44704.

8. Section 25.2 is amended by revising paragraph (c) to read as follows:

§ 25.2 Special retroactive requirements.

* * * * *

(c) Compliance with subsequent revisions to the sections specified in paragraph (a) or (b) of this section may be elected or may be required in accordance with § 21.101(a) of this chapter.

Issued in Washington, DC, on May 31, 2000.

Jane F. Garvey,

Administrator.

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