

Federal Aviation Administration – [Regulations and Policies](#)  
Aviation Rulemaking Advisory Committee

Aircraft Certification Procedures Issue Area  
International Certification Procedures Harmonization Working Group

**Task 1 – Type Certification Procedures**

# **Task Assignment**

**Aviation Rulemaking Advisory Committee; Aircraft Certification Procedures Subcommittee; International Certification Procedures Harmonization Working Group**

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

**ACTION:** Notice of establishment of the International Certification Procedures Working Group.

**SUMMARY:** Notice is given of the establishment of the International Certification Procedures Working Group by the Aircraft Certification Procedures Subcommittee. This notice informs the public of the activities of the Aircraft Certification Procedures Subcommittee of the Aviation Rulemaking Advisory Committee.

**FOR FURTHER INFORMATION CONTACT:** Mr. William J. (Joe) Sullivan, Executive Director, Aircraft Certification Procedures Subcommittee, Aircraft Certification Service (AIR-3), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267-9554; FAX: (202) 267-9562.

**SUPPLEMENTARY INFORMATION:** The Federal Aviation Administration (FAA) established an Aviation Rulemaking Advisory Committee (56 FR 2190, January 22, 1991) which held its first meeting on May 23, 1991 (56 FR 20492, May 3, 1991). The Aircraft Certification Procedures Subcommittee was established subsequently meeting to provide advice and recommendations to the Director, Aircraft Certification Service, FAA, regarding the aircraft certification procedures in part 21 of the Federal Aviation Regulations (57 FR 39267; August 28, 1992).

The FAA announced at the Joint Aviation Authorities (JAA)-Federal Aviation Administration (FAA) Harmonization Conference in Toronto, Ontario, Canada, (June 2-5, 1992) that it would consolidate within the Aviation Rulemaking Advisory Committee structure an ongoing objective to "harmonize" the Joint Aviation Requirements (JAR) and the Federal Aviation Regulations (FAR). Coincident with that announcement, the FAA assigned to the Aircraft Certification Procedures Subcommittee those rulemaking projects related to international certification procedures for type certification of new and derivative aircraft which were then in the process of being coordinated between the JAA and the FAA. The Harmonization process included the intention to present the results of JAA/FAA coordination to the public in the form of either a Notice of Proposed Rulemaking or an advisory circular—an objective comparable to and compatible

with that assigned to the Aviation Rulemaking Advisory Committee. The Aircraft Certification Procedures Subcommittee, consequently, established the International Certification Procedures Working Group.

Specifically, the Working Group's tasks are the following: The International Certification Procedures Working Group is charged with making recommendations to the Aircraft Certification Procedures Subcommittee concerning the FAA disposition of the following rulemaking subject recently coordinated between the JAA and the FAA:

The International Certification Procedures Working Group is charged with making recommendations to the Aircraft Certification Procedures Subcommittee concerning the FAA disposition of rulemaking subjects recently coordinated between the JAA and the FAA concerning the type certification procedures for changes to aeronautical products. Specifically, considering factors such as safety benefits, resources, and service experience, the working group should address the following issues:

1. Can later revisions of the airworthiness standards be used for the certification basis of changes to aeronautical products?
2. Can later revisions of the airworthiness standards be incorporated into the existing fleet?
3. Can new revisions of the airworthiness standards be incorporated into aeronautical products in production and in operation, as well as in new designs?

**Reports:** A. Recommend time line(s) for completion of the task, including rationale, for Subcommittee consideration at the meeting of the subcommittee held following publication of this notice.

B. Give a detailed conceptual presentation on the task to the Subcommittee before proceeding with the work stated under item C through E, below.

C. Draft a Notice of Proposed Rulemaking for the tasks proposing new or revised requirements, a supporting economic analysis, and other required analysis.

D. Draft an advisory circular to provide guidance complementing the rules proposed in the Notice of Proposed Rulemaking, and any other collateral documents the working group determines to be needed.

E. Recommend a training syllabus for FAA employees charged with administering the rule, including videotapes and other training support.

F. Give a status report on the task at each meeting of the Subcommittee.

The International Certification Procedures Working Group will be comprised of experts from those organizations having an interest in the task assigned to it. A working group member need not necessarily be a representative of one of the organizations of the parent Aircraft Certification Procedures Subcommittee or of the full Aviation Rulemaking Advisory Committee. An individual who has expertise in the subject matter and wishes to become a member of the working group should write the person listed under the caption **FOR FURTHER INFORMATION CONTACT** expressing that desire, describing his or her interest in the task, and the expertise he or she would bring to the working group. The request will be reviewed with the subcommittee chair and working group leader, and the individual advised whether or not the request can be accommodated.

The Secretary of Transportation has determined that the information and use of the Aviation Rulemaking Advisory Committee and its subcommittees are necessary in the public interest in connection with the performance of duties imposed on the FAA by law. Meetings of the full committee and any subcommittees will be open to the public, except as authorized by section 10(d) of the Federal Advisory Committee Act. Meetings of the International Certification Procedures Working Group will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of working group meetings will be made.

Issued in Washington, DC, on December 11, 1992.

William J. Sullivan,

Executive Director, Aircraft Certification Procedures Subcommittee, Aviation Rulemaking Advisory Committee.

[FR Doc. 92-30887 Filed 12-18-92; 8:45 am]

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## **Recommendation**

5/6/26

[4910-13]

Draft of April 17, 1996{PRIVATE }

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

[14 CFR Parts 11, 21, and 25]

[DOCKET No. xxxxx; Notice No. xx-xxx]

RIN 2120-AE93

**Type Certification Procedures for Changed Products**

**AGENCY:** Federal Aviation Administration, DOT

**ACTION:** Notice of Proposed Rulemaking (NPRM)

**SUMMARY:** This notice proposes to amend the procedural regulations for the certification of changes to type certificated products. The amendments are needed to accommodate the trends toward fewer products that are of completely new design and more products with repeated changes of previously approved designs. Safety would be enhanced by applying the latest airworthiness standards, to the greatest extent practical, for the certification of certain design changes of aircraft, aircraft engines, and propellers.

**DATES:** Comments must be received on or before [Insert 120 days after publication in the Federal Register.]

**ADDRESSES:** Comments on this proposal must be mailed in triplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-200, Docket No. , 800 Independence Avenue SW, Washington, DC 20591, or delivered in person to room 915G at the same address. Comments may also be submitted electronically to the following Internet address: [nprmcmts@mail.hq.faa.gov](mailto:nprmcmts@mail.hq.faa.gov). Comments submitted must be marked: Docket No. . Comments may be inspected in room 915G weekdays, except Federal holidays, between 8:30 am and 5:00 pm.

**FOR FURTHER INFORMATION CONTACT:** Lyle C. Davis, Certification Procedures Branch (AIR-110), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, telephone (202) 267-9588.

## **SUPPLEMENTARY INFORMATION:**

### **Comments Invited**

Interested persons are invited to participate in the proposed rulemaking by submitting such written data, views, or arguments as they may desire. Commenters should identify the regulatory docket or notice number and submit comments in triplicate to the Rules Docket at the address specified above. All comments will be considered by the Administrator before action on the proposed rulemaking is taken. The proposals contained in this notice may be changed in light of the comments received. All comments will be available in the Rules Docket, both before and after the closing date for comments, for examination by interested persons. A report summarizing each substantive public contact with Federal Aviation Administration (FAA) personnel concerning this rulemaking will be filed with the docket. Commenters wishing the FAA to acknowledge receipt of their comments must submit with those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. .". The postcard will be dated and time stamped and returned to the commenter.

### **Availability of NPRMs**

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the Fedworld electronic bulletin board service (telephone: 703-321-3339), the Federal Register's electronic bulletin board service (telephone: 202-512-1661), or the FAA's Aviation Rulemaking Advisory Committee Bulletin Board service (telephone: 202-267-5948).

Internet users may reach the FAA's web page at <http://www.faa.gov> or the Federal Register's web page at [http://www.access.gpo.gov/su\\_docs](http://www.access.gpo.gov/su_docs) for access to recently published rulemaking documents.

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue SW,

Washington, DC 20591; or by calling (202) 267-9680. Communications must identify the notice number or docket number of this NPRM.

Persons interested in being placed on the mailing list for future NPRM's 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.

## **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 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 are of such significantly new design that a new type certificate is required. 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 substantial differences from

the original product. As a result, many newly manufactured aeronautical products are not being required to show compliance with the more recent airworthiness standards. The procedural regulations need to be changed to correspond with this trend toward fewer new type certificates.

### **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 and revising 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 for aircraft, aircraft engines, and propellers. The FAA may prescribe in any such certificates the duration of the certificate, and the terms, conditions, and limitations as required in the interest of safety.

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.

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 for 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." 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 obligation of the FAA, 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 practical;

(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 truly novel or unusual design features that it has, as yet, not had an adequate 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; and

(4) To allow flexibility in design. The airworthiness standards of 14 CFR Chapter 1, subchapter C, are intentionally objective in nature, and the procedural regulations permit design changes over the operational life of a product.

Originally, the FAA would issue special conditions informally as an interpretation of the "no unsafe feature or characteristic" regulations; however, in 1967, the FAA formalized the process with the adoption of § 21.16. As provided in that section, special conditions are issued as regulations in accordance with public comment provisions of 14 CFR part 11 (part 11). The adoption of § 21.16 extended the special condition process to include aircraft engines and propellers. The provision in § 21.21(b)(2), that a type certificate would be issued for an aircraft only if no unsafe feature or characteristic existed, remained unchanged.

The phrase "novel or unusual" is used in describing design features for the issuance of special conditions under the provisions of § 21.16. These design features involve a state of technology not considered for the applicable airworthiness standards at the time they were written; in some areas, the state of the regulations may lag the state of the art of new designs. This disparity is due both to the rapidity in which the state of the art is advancing in civil aeronautical design and the need to develop a sufficient experience base with new technology

before proceeding with general rulemaking. Therefore, there may be instances in which special conditions are required for design features considered "state of the art" in the aircraft industry. Conversely, many new design features that might be thought of as "novel or unusual" in the context of the product's original certification basis may already be covered by existing regulations, thereby obviating the need to issue special conditions. This fact is recognized in existing § 21.101(b)(1).

For example, in 1980, the holder of a small airplane type certificate who installed turboprop engines in place of reciprocating engines did so by complying with appropriate later regulations. Because appropriate regulations were available for the installation of turboprop engines, special conditions were not issued for installation of the engines. These changes were made through the FAA issuing an amendment to the type certificate originally issued in 1964. The regulations were changed to accommodate turboprop engines in 1969.

Special conditions are not issued for general upgrading of the applicable airworthiness standards to achieve a higher level of safety. Whenever the FAA concludes that a compelling need exists for a higher level of safety in designs already type certificated or designs for which a type certificate application is in progress, rulemaking is proposed in accordance with the general rulemaking procedures of part 11, the Administrative Procedure Act, and Executive Order 12866. A complete statement of the FAA intent with respect to the application of special conditions is found in the preamble to amendment 51 to Part 21, (45 FR 60170, September 11, 1980).

Sometimes new airworthiness standards contain provisions that, in the interest of safety in air transportation, should be applied retroactively to aircraft used in air carrier service. Typically this is accomplished by proposing changes to 14 CFR parts 121 and 135, and sometimes part 91, through rulemaking procedures. Finally, §§ 23.2, 25.2, 27.2, and 29.2 provide retroactive regulations in the airworthiness standards.

## **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. Prior to the early 1940's, an applicant for a changed product, such as an airplane with an alternate engine installation, was required to apply for a new type certificate. The regulations in effect prior to the early 1940's required an applicant for a changed product to apply for a new type certificate for a change such as an alternate engine installation. When a new type certificate was required, the applicant had to 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 a period of time. The then current standards were, therefore, essentially the same as those with which the original product had to comply. Later, more rapid changes in technology resulted in significant changes in the airworthiness standards over relatively short periods of time. An applicant for a type certificate for a changed product could thus be faced with complying with airworthiness standards that varied considerably from those with which the original product complied. In some instances, the differences in standards could be so great that an applicant would be discouraged from making any changes, including changes that would, in themselves, contribute to the safety of the product. To relieve this situation, by the early 1940's, an application for a new type certificate was required only if the change was quite extensive.

Section 21.19(a) requires a new type certificate when a change is considered so extensive that a substantially complete investigation of compliance with the regulations is required. In addition, §§ 21.19(b), (c), and (d) provide specific types of changes that require an application for a new type certificate. For a normal, utility, acrobatic, commuter, or transport category aircraft, paragraph (b) requires a new aircraft type certificate if the proposed change is (1) in the number of engines or rotors, or (2) to engines or rotors using different principles of propulsion or to rotors using different principles of operation. Similarly, paragraph (c) requires a new engine type certificate if the proposed change is in the engine's principle of operation, and paragraph (d)

requires a new propeller type certificate if the proposed change is in the number of blades or in the principle of pitch change operation.

The basis for § 21.19(b)(1) originated in the early 1950's following the issuance of an amended type certificate to an applicant who altered a popular single-engine, four-passenger, light airplane into a twin-engine model. Although that conversion was approved by an amendment to the original type certificate, the agency recognized that the conversion from one to two engines added considerable complexity to the airplane and greatly affected its handling characteristics. Therefore, the predecessor of § 21.19(b)(1) was adopted requiring a new type certificate for a change in the number of engines or rotors. The regulatory language was broad enough in scope to include any change in the number of engines or rotors whether such changes would simplify or add complexity to the type design.

The FAA does not require an applicant to apply for a new type certificate to add small standby or auxiliary engines to an aircraft. In the 1960's, with the development of small turbojet engines to be used as auxiliary engines, the FAA defined a jet engine that develops less than 50 percent of the static thrust developed by one of the primary propulsion engines as an auxiliary engine. The FAA considers the "number of engines" as used in § 21.19(b)(1) to refer to the number of primary propulsion engines and not to any standby or auxiliary engines to be installed. The FAA has issued a large number of exemptions from the regulation concerning a change in the number of engines.

Prior to 1957, predecessors of current § 21.19(b)(2) stated that an applicant must make a new application for type certificate if the proposed change was to engines employing different principles of operation or propulsion. This meant that an applicant desiring to replace reciprocating engines with the same number of turbopropeller engines would have to apply for a new type certificate. During that period, it was recognized that considerable advances in safety, reliability, and passenger comfort could be realized by replacing reciprocating engines in certain transport category airplanes with turbopropeller engines. In order to encourage such beneficial

changes, the reference to different principles of operation was deleted in 1957 for transport category airplanes. As a result, an applicant may be granted approval for a conversion of this nature without applying for a new type certificate providing the applicant complies with certain later standards applicable to turbine-powered airplanes. In the broadest sense, all powered airplanes achieve propulsion by accelerating a mass of air and/or exhaust gases. In the narrower context of § 21.19(b)(2), however, "principles of propulsion" means propeller-driven versus turbojet.

Section 21.19(b)(2) also states that an applicant must make a new application for a type certificate if the proposed change is to rotors employing different principles of operation or propulsion. The FAA is not aware of any instance in which this specific section was the basis for requiring an application for a new type certificate. This is probably due to the fact that any change of this nature, together with all related changes, would have been so extensive that a new type certificate would have been required under the provisions of § 21.19(a).

The FAA has never granted any exemptions from the regulation for a new aircraft type certificate for a change to engines or rotors using different principles of propulsion. Similarly, no exemptions have been granted from the engine or propeller type certificate regulations for changes involving the principle of engine operation, for changes in the number of propeller blades, or for changes in the principle of pitch change operation.

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. They are frequently referred to as the "original certification basis."

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 be amended to become less stringent, but a related regulation may become more stringent. In a situation of this nature, the applicant must also comply with the related compensating regulation as well. Current § 21.101(a) does not otherwise require compliance with later amendments.

An applicant for a change to a type certificated product is responsible for showing that the entire product, as altered, not just that the change itself, complies with the 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.

Section 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. 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 towards fewer products that are of completely new designs, which would require a new type certificate. Over a period of time, a series of changes to an original product may have been made so that the current 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 result collectively in a product with substantial differences from the original product. For example, one model originally manufactured as a normal category airplane with two reciprocating engines has been changed through a series of alterations to incorporate turbopropeller engines, a stretched and heightened fuselage, a tricycle landing gear, a modified wing planform and a 42 percent increase in maximum takeoff weight. In this particular case, the majority of changes were made through the FAA's issuing supplemental type certificates to modifiers other than the type certificate holder. However, the type certificate holder could have made the same incremental changes without applying for a new type certificate each time. In another instance, a type certificate holder effected significant changes in the design of a turbojet transport category airplane without obtaining a new type certificate by making a series of changes to its existing type certificate. Each incremental change, by itself, was determined not to be so extensive as to require a new type certificate under § 21.19(a). This airplane evolved into a configuration approximately 40 percent greater in fuselage length and with a 92 percent greater maximum takeoff weight than the original model. These changes, which have been incorporated into newly manufactured airplanes, were made through the FAA issuing amendments to the type certificate.

Another trend in manufacturing is to keep products in production over several decades. Some currently manufactured transport category 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 standards. However, current procedural regulations (part 21) do not require that changed products comply with the current standards.

The basic premise behind the FAA's current policies for the procedures and airworthiness standards for type certification is that the highest practical level of safety should be achieved by products being manufactured at any given time. In dealing with this premise, the FAA has had to continually weigh the desire for the maximum level of safety with the cost to the manufacturers, operators, and traveling public for achieving that level of safety. This balance between safety and cost has been severely exacerbated by the introduction of highly sophisticated products whose development and manufacture have become enormously expensive. This is one reason why, as stated before, 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 is not whether a product is produced under a new type certificate or an amended 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 practical. In addition, to require areas unaffected by the change to comply with the latest standards is not only unreasonably costly but may in fact 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. Thus, it is common place that products in service today possess a level of safety significantly greater than that embodied in their certification basis.

When establishing the highest practical 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 latest 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 where the new standards were issued to address a deficiency in the design in question or where 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.

It can be argued, for consistency, that new airworthiness standards should apply across the board to the entire aircraft fleet; however, 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. 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 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 deemed that a 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 and/or airplanes in service to comply retroactively 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 manufactured airplanes were required for the existing fleet and were implemented in the operating regulations, such as part 121.

In 1965, the FAA granted an exemption from the provisions of § 21.19(b)(1) to permit conversion of a four-engine amphibian to a twin-engine configuration without the applicant applying for a new type certificate. During the 1980's, three applicants petitioned for exemptions from the above regulations so they could convert Boeing 727 airplanes from the original three-engine configuration to one with two engines without having to apply for new type certificates. Another applicant petitioned for a similar exemption to replace the four engines of a Lockheed

1329 Jetstar aircraft with two engines of more recent vintage. The FAA granted each exemption with the condition that the petitioner comply with the provisions of then current part 25 in all areas, systems, components, equipment, or appliances affected by the conversion. The appropriateness of some of the regulations being applied to a design change involving a reduction in the number of engines may be questioned because of the simplification involved; nevertheless, rulemaking to change this regulation has not been undertaken.

The FAA also granted a number of exemptions that permitted increasing the number of engines without the need for the applicants to obtain new type certificates. In 1985, an applicant received an exemption to replace two reciprocating engines in Grumman Albatross amphibians with four turbopropeller engines without having to obtain a new type certificate. In granting the exemption, the FAA concurred that the alteration should improve the Albatross by increasing safety, increasing powerplant reliability, and improving overall aircraft efficiency. The exemption noted that compliance with § 21.19(b)(1) would have required changes to some basic systems that had provided satisfactory performance for many years and had contributed to the safety record of those airplanes. Applying then-current regulations to components and systems not affected by the installation of the four engines would have been time consuming and costly, and would not necessarily have led to a higher level of safety. As with the exemptions to reduce the number of engines, this exemption was granted with the condition that the petitioner comply with the provisions of then current part 25 in all areas, systems, components, equipment, or appliances affected by the conversion.

A similar exemption was also granted in 1989 to enable an applicant to increase the number of engines from one to two in certain Bell 206 series rotorcraft. The petitioner cited the increased safety afforded by a twin-engine configuration in the event a failure occurred during hover, and also the enhanced altitude performance. As a condition of the grant of exemption, the applicant was required to show that the altered rotorcraft complied with the standards of part 27 in effect on the date of application for the change for all areas, systems, equipment, or appliances

that were changed or significantly affected by the change.

These exemptions point out an important feature that has been included in this proposed rulemaking. The number of engines is not, in itself, an appropriate criterion for requiring an application for a new type certificate as long as the concerns that originally prompted this regulation are satisfied by the condition that the type design complies with the regulations effective on the date of the application for the change in those areas changed or affected by the change.

### **Recent FAA Actions**

Apart from safety considerations, 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, the FAA has participated in the activities of 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 includes representatives of the European Joint Aviation Authorities, Transport Canada, Aerospace Industries Association of America, Air Transport Association of America, General Aviation Manufacturers Association, International Air Transport Association, Association Europeenne des Constructeurs de Materiel Aerospatial, 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 provides 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 utilized the International Certification Procedures Harmonization Working Group, which consists of the original ad hoc committee formerly known as the ICPTF. The purpose of this working group was to recommend to ARAC various rulemaking proposals pursuant to its area of expertise. ARAC can then make recommendations to the FAA, and the FAA decides whether or not to issue a proposal based on the ARAC recommendation.

The FAA recognizes the difficult task the working group undertook in the effort to address the issues in this proposed rule and in the advisory material. Much of the work done within the working group could not have been accomplished without the assistance of working group members representing the aviation community.

The Working Group has made recommendations to ARAC concerning the type certification procedures for changes to aeronautical products, newly manufactured products, and products already in service. The rulemaking proposed by the FAA in this notice reflects the working group and ARAC recommendations in the type certification procedures for changed products. Similar corresponding changes are also being proposed by Transport Canada and the Joint Aviation Authorities.

### **FAA's Proposed Policy on Changed Products**

The FAA intends to require that applicants for changes to type certificated products show compliance with the latest amendments to the airworthiness standards that are applicable to the product being changed. Exceptions to requiring a showing of compliance with the latest amendments would be provided to accommodate variations in the kinds of type certificated

products, of changes to these type certificated products, and revisions of the airworthiness standards. These exceptions would permit compliance with regulations issued prior to the regulations in effect on the date of application for the change. The exceptions would apply to a product that is not undergoing a significant change, and, for a product undergoing a significant change, those portions of the product that are not related to the change. In addition, the exceptions would include those later amendments that would not materially increase the level of safety of the product to be changed, or those for which compliance would be impractical.

This proposed rulemaking would amend the type certification procedures for changes to type certificated products to bring the certification basis for changed products and for newly type certificated products closer together. The intent is to ensure that when an essentially new product is developed through a series of changes, regardless of the extent of each change, the final product achieves a level of safety similar to that of a comparable new product. However, this concept will be tempered with the knowledge that a good design does not become unsafe as soon as a new regulation has been published.

The FAA is already encouraging applicants of certain type certificated products undergoing alterations to comply with later amendments of the airworthiness standards. By this rulemaking, the FAA proposes to require all proposed changes for all type certificated products to comply with later amendments of the airworthiness standards.

Some differences may be acceptable between the certification basis for a product undergoing a change and the current regulations that would be applicable if a new product was being type certificated. This acceptance would be based on there not being a defined safety issue involved in the specific product. The FAA has determined that the long term result of this approach will be that an amended type certificate will have a certification basis that provides a comparable level of safety to that provided by the certification basis of a new type certificate for the same product.

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. By separate notice ( ), the FAA is also inviting interested persons to comment on the proposed advisory circular. The FAA will consider comments from this notice and comments received on the advisory circular before taking any final action on either.

### **Discussion of the Proposed Rulemaking**

Sections 11.11, 21.19, 21.101, 21.115, and 25.2 would be amended as follows to implement the policy discussed above in relation to changes to products:

#### **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 proposed changes to § 21.101, described later, it is necessary to amend § 11.11 to refer to § 21.101(c) instead of § 21.101(b)(2). This would not be a substantive change.

#### **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. This sentence has caused confusion because it covers several types of changes for all products -- airplanes, rotorcraft, aircraft engines, and propellers. In addition, current paragraphs (b), (c), and (d) list other specific types of changes that mandate a new application for a type certificate. Only the general language of current paragraph (a) would be

incorporated into the new § 21.19, while the previously listed specific changes would be subject to case-specific evaluations to determine whether they are substantial. Application of § 21.19 would depend upon an evaluation of whether the proposed change in "design, power, thrust, or weight" would necessitate a substantially complete investigation of the compliance of the changed product. In applying the concept of "substantially complete investigation" the FAA will assess the number of airworthiness regulations of the certification basis that must be reinvestigated. If that number constitutes most of the airworthiness standards, then a new type certificate would be required. Any of the following airplane design changes, considered alone, could typically be regarded as a substantial design change:

- (1) Change from a high wing to a low wing airplane, or vice versa;
- (2) Change of empennage configuration for larger airplanes (cruciform vs 'T' or 'V' tail);
- (3) Complete repositioning of engines (tail to wing, etc.); and
- (4) An increase in airplane design complexity resulting from an increase in the number of engines.

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. Invariably, these types of changes fall into one of two categories -- those that are 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 are so extensive that a new application would be required in any event because a complete investigation of compliance is required. Accordingly, the provisions of current § 21.19(b) are not needed and would be deleted by this proposal. The exemptions that have been granted from current § 21.19(b) have typically required that those areas, systems, components, equipment, and appliances that are changed or significantly affected by the change must comply with the applicable regulations in effect on the date of the application for that

change. This requirement would be embodied in proposed § 21.101, which would generally require that an applicant for a change to a type certificate must comply with the regulations in effect on the date of the application for that change, with an exception, however, that those areas, systems, components, equipment, and appliances not affected by significant changes could continue to comply with the regulations incorporated in the reference type certification basis. Accordingly, this proposed amendment would be consistent with the exemptions that have been granted on changes in the number of engines. The need for requiring a new application for a type certificate would be alleviated in many instances by the proposed changes to § 21.101.

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. Also, current § 21.19(d) describes specific changes in which the applicant must apply for a new propeller type certificate. These changes are in the number of blades or principle of pitch change operation. Invariably, the type of changes set forth in both of these sections are so extensive that a new application would be required in any event because a complete investigation of compliance is required. Accordingly, these types of changes would be deleted 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.

### **Section 21.101**

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 application for the change, if elected by the applicant, plus any other amendments the Administrator finds to be directly related.

Current paragraph (b) 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. In this case 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." This means that the level of safety must be at least equal to the level of safety that was required by the regulations referenced in the type certificate.

To ensure that the products meet the latest airworthiness standards wherever practical, proposed § 21.101 would specify that, with certain exceptions, the applicant for a change must comply with the applicable regulations in effect on the date of the application for the change. The intent of this proposal is to apply the applicable regulations in effect on the date of the application to those areas, systems, components, equipment, and appliances affected by the change. For those areas, systems, components, equipment, and appliances not affected by the change, continued compliance with the regulations incorporated by reference in the type certificate is considered acceptable.

These proposed procedures would be applicable for changes of aircraft, aircraft engines, and propellers that have been type certificated under §§ 21.24, 21.25, 21.27, and 21.29 as well as § 21.21. At first glance, because some of these regulations do not depend upon published airworthiness standards that are current, products type certificated under these regulations may not appear to benefit from the procedures of this proposed rulemaking. However, after careful consideration, the FAA has determined that changes to products that have been type certificated under any of these regulations would benefit from the enhanced safety associated with the appropriate later airworthiness standards. This takes into consideration that the certification basis, in some cases, may not be well defined or be up-to-date.

For example, surplus military aircraft type certificated in the restricted category under § 21.25 normally are accepted on the basis of the previous military qualifications acceptance and service record in lieu of showing compliance with an airworthiness standard. However, changes to these products usually are not supported by the military service history, therefore, they must

meet an appropriate airworthiness standard. Compliance with the later amended airworthiness standards would provide the associated enhanced safety, and the exceptions provided by proposed § 21.101(b) would ensure the practicality involved with the use of later amended airworthiness standards for changes of a product that never met an airworthiness standard initially.

Another example is surplus military aircraft being type certificated under § 21.27. Since this regulation was first adopted, changes have been made to the Federal Aviation Regulations to upgrade the level of safety required for civilian aircraft and to incorporate certification standards for modern-state-of-the-art technology. Therefore, it seems logical that the level of safety of changes to products type certificated under § 21.27 would benefit from compliance with the later airworthiness standards.

Limited category aircraft are surplus military aircraft, mostly from World War II, that were type certificated under Part 9 of the Civil Air Regulations for use other than air transport. These aircraft were not intended to carry persons or property for compensation or hire, and normally were accepted on the basis of their previous military qualifications acceptance and service record. Currently, alterations to these aircraft may be approved based on a showing that the alteration would not detract from the satisfactory military safety record. However, changes of these products are not supported by the military service history, therefore, they must comply with appropriate airworthiness standards. Compliance with the later amended airworthiness standards would provide the associated enhanced safety, and, with the exceptions provided by proposed § 21.101(b), would ensure the practicality involved with the use of later amended airworthiness standards for changes of a product.

#### Section 21.101(a)

This proposed paragraph would 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.

#### Section 21.101(b)

This proposed paragraph would provide exceptions to the regulation in proposed paragraph (a), permitting the applicant to comply with earlier amendments to the regulations. A "regulation" as used herein means individual paragraphs of the Federal Aviation Regulations or predecessor regulations. When choosing the amendment level of a regulation, all related regulations associated with that amendment level would have to be included. The amendment level chosen would not be allowed to predate either the existing basis or anything required by the retroactive sections, §§ 23.2, 25.2, 27.2, or 29.2. Design changes inevitably vary both in complexity and magnitude so it is necessary for each proposed change to be evaluated on a case by case basis, taking into account previous changes and their certification basis. Individual incremental changes may be modest; however, the cumulative effect can result in a significant overall change. In this context, the following factors should be considered: (1) the extent of the previous changes and the extent to which later amendments have been addressed for these individual changes; and (2) the extent of revisions to the airworthiness standards from those of the original certification basis of the model being changed. When an essentially new product is developed, step by step, through a series of non-substantial design changes, it should achieve a level of safety similar to that of a comparable new product.

Design changes will be classified as either nonsignificant, significant, or substantial. A small weight increase or the installation of a flight management system would not normally be considered a significant change. A change from turboprop to turbofan engines would normally be a significant change. A change from a low wing to a high wing would normally be a substantial change.

In evaluating a design under the exceptions provided for in § 21.101(b), the FAA will rely on documented engineering, safety, and economic data. These data should have a degree of

thoroughness and engineering quality expected for initial compliance with airworthiness standards.

Section 21.101(b)(1)

This proposed paragraph would provide the first exception to the regulation in proposed paragraph (a), to show compliance with the latest applicable regulations. The proposed paragraph would state that the applicant would be allowed to demonstrate compliance with earlier regulations, but not earlier than the regulations incorporated in the existing 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.

There may be concurrent significant and non-significant changes made to a product. For example, there may be a small change in the model of engines used at the same time large changes are made to the airframe. Each part of the total change would be evaluated to determine its significance on its own merit. It must be recognized, however, that a number of related non-significant changes may collectively represent a significant change to the product.

Section 21.101(b)(2)

This proposed paragraph would provide the second exception to the regulation in proposed paragraph (a), to show compliance with the latest applicable regulations. The proposed paragraph would state that the applicant may show compliance with earlier regulations for those areas, systems, components, equipment, and appliances that are not affected by the change.

The FAA recognizes that arbitrarily requiring compliance with later regulations in areas, systems, components, equipment, and appliances not affected by the change may cause redesign of components that have an acceptable service record without an attendant improvement in safety, or may have the counterproductive effect of discouraging any changes at all, including those that would provide a significant improvement in safety.

Section 21.101(b)(3)

This proposed paragraph would provide the third exception to the regulation in proposed paragraph (a) to show compliance with the latest applicable regulations. If compliance with a regulation in effect on the date of the application for the change would be impractical, or would not contribute materially to the level of safety of the product to be changed, the applicant may demonstrate compliance with an earlier amendment of a regulation for which such compliance would be practical and would contribute materially to the level of safety of the product to be changed, 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.

Compliance with the later amendment would be considered to "not materially contribute to the level of safety" if the level of safety achieved by the existing design with the proposed design change would not be enhanced by compliance with that later amendment. In demonstrating this, the applicant would show that the level of safety achieved by the existing design incorporating the proposed design change would achieve a safety level commensurate with that reflected in the later amendment.

The factors that would be considered in comparing the level of safety achieved by the existing design incorporating the proposed design change with the level of safety achieved by compliance with the later amendment would include: whether the product has compensating design features; the extent that the service experience of the product shows that the performance and reliability of the product provides a level of safety commensurate with later amendments; and whether compliance with a later amendment, notably when it necessitates a redesign, would have an adverse effect on the level of safety in terms of performance or reliability.

Nothing would limit the future operation or transfer of a product after a design change is approved with an older certification basis; furthermore, the intent of this proposal is to establish

certification bases appropriate to the designs of the products and the designs of the changes. Therefore, if an applicant for a design change is changing one or two products, and another applicant is making the same change to 100 of the same product, the applicants' design changes will be certificated to the same basis.

Demonstrating that compliance would not materially contribute to the level of safety could necessitate analyses of the safety features of the existing design and the proposed change, and an analysis of the safety concerns addressed by the relevant amendment. The evaluation may be accomplished using a numerical/statistical approach, subject to the availability and relevance of applicable data. In practice, engineering judgment, based on scientific, rational, and reasoned analysis of the relevant data, will be used in the development of this evaluation. The essentials of the evaluation would involve:

- a. A clear understanding of the regulatory change and what prompted the change;
- b. A detailed knowledge of the proposed design feature; and
- c. A comprehensive review of the applicable service experience.

In some instances, an applicant may be unable to show that compliance with the original certification basis, together with the level of safety demonstrated by the applicable service experience, provides a level of safety comparable with the later airworthiness regulations. If compliance with the later airworthiness regulations would then involve a design change, the benefits of such a redesign would be considered in the light of any possible adverse effects of the redesign on operation, reliability, durability, etc.

An applicant for a change to a type certificate would not be required to demonstrate that the changed product complies with a later amendment to an airworthiness standard if the applicant shows that such compliance would be "impractical." 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. Where compliance with the later

amendment would prompt a redesign, the cost of redesigning other parts of the product to accommodate this redesign also would be considered.

The FAA continually weighs the desire for the maximum level of safety with the cost to the manufacturers, operators, and traveling public for achieving that level of safety. When a design is new, it is relatively easy to comply with the latest airworthiness requirements at a reasonable cost. However, when a design is being altered, different circumstances are present, such as existing components of the product that are not being changed, and the existence of service experience of the product. Under these conditions, it may become unreasonably costly for the change to comply with the latest standards.

A safety/resource evaluation could be used to assist in determining impracticality, and would be discussed between the applicant and the Administrator while establishing the certification basis. The economic issues associated with compliance with the later amended airworthiness standards would be a major portion of this evaluation.

Any safety/resource evaluation used to determine "impractical" should evaluate the enhancement of the safety involved with complying with the airworthiness regulation under consideration along with the cost associated with this compliance. This evaluation would weigh the factors associated with the safety benefit and the factors associated with the cost of compliance.

The factors involved with the safety issue could include seriousness of the consequences of the hazard that the regulatory change addresses, frequency of those consequences, and the effectiveness of applying the regulatory change to the changed product. The factors involved with the cost of compliance could include labor, new capital equipment needed, scrap, part interchangeability, operating costs, and revenue loss. The agency is seeking comments on this concept of using "Impractical" as defined herein.

Associated Advisory Circular

The proposed associated advisory circular provides an analytical procedure that is an example of an evaluation of the practicality of requiring compliance with the later amendments of the regulations as required in proposed § 21.101(a). This procedure includes a cost/benefit analysis that is intended only to facilitate a discussion between the applicant and the Administrator in determining if a later regulatory revision should be implemented for a proposed design change of a type certificated product. This kind of procedure is intended to be used, along with good judgment, by a team of technical experts to evaluate the relative merits of regulatory action governing changes to type certificated products. This kind of procedure could be used for all kinds of products even though the procedure was developed based on experiences in type certification of transport airplanes used in commercial, revenue-producing operations.

The development of the procedure was based on the transport airplane category because of greater worldwide interest and greater documentation for this category than for other categories. The proposed procedure was developed through a series of iterations attempting to relate the effect of the many revisions of part 25 on safety and the cost of complying with those regulatory revisions.

#### Section 21.101(c)

This proposed paragraph would contain the provisions of current § 21.101(b)(2) concerning special conditions. For consistency with the other proposed changes to § 21.101, this paragraph would state that an applicant for a change must comply with any special conditions, and amendments to those special conditions, if needed, that would provide a level of safety equal to that established by the regulations in effect on the date of the application for the change. The interpretation of "novel or unusual design features" shall be the same as present practice under current § 21.101(b)(2). The provisions of current § 21.101(b)(1), concerning the use of later regulations when the regulations incorporated by reference do not provide adequate standards with respect to the proposed change, would no longer be needed and would not be incorporated

into the proposed regulation. This is because proposed § 21.101(a) would require the use of later regulations.

The provisions of current § 21.101(c), concerning the replacement of reciprocating engines with turbopropeller engines, are not incorporated into the proposed regulation. A change of this nature would be considered a significant change, and compliance with the regulations in effect on the date of application for the change, therefore, would be required.

#### Section 21.101(d)

This proposed paragraph would state that an application for a change to a type certificate for a transport category aircraft would be effective for 5 years, and an application for a change to a type certificate for all other products would be effective for 3 years. These proposed effectivity periods for an application are the same as those in current § 21.17(c) and (d) for an application for a type certificate. Because current § 21.101 requires compliance with the regulations incorporated by reference in the type certificate and because the certification basis of the original product doesn't change, having an effectivity period for an application for a design change has not been necessary. Under the proposed § 21.101, which would require meeting the airworthiness standards in effect on the date of the application for the change, it is necessary to limit the effectivity of the application for a change, to support the intent of the proposed regulation. This proposed section would state that if an application for a design change expires, an applicant may file a new application or apply for an extension of the original application.

#### **Section 21.115**

The type certificate holder may obtain approval for a change either by amending the type certificate under § 21.101 or by obtaining a supplemental type certificate under § 21.115. Any other modifier would have to obtain a supplemental type certificate under § 21.115. 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.

Current § 21.115 incorporates the provisions of current § 21.101(a) and (b) by reference, making the provisions of the latter section equally applicable to applicants for supplemental type certificates. In view of the proposed changes to § 21.101, it is necessary to amend § 21.115 to refer simply to § 21.101 rather than specifically to § 21.101(a) and (b). This would not be a substantive change.

## **Section 25.2**

Current § 25.2(c) incorporates the provisions of current §§ 21.101(a)(2) and (b) by reference, addressing the subsequent revisions to the special retroactive regulations. To remain consistent with the proposed changes to § 21.101, it is necessary to amend § 25.2(c) to refer to § 21.101(a). This would not be a substantive change.

## **International Compatibility**

The proposal has been harmonized with the aviation authorities of Canada and Europe. Similar corresponding changes to regulations governing type certification procedures for changed products are being proposed by Transport Canada and the Joint Aviation Authorities.

## **Regulatory Evaluation, Regulatory Flexibility Determination, and Trade Impact Assessment**

Three important requirements pertain to economic impacts of regulatory changes to the Federal Aviation Regulations. First, Executive Order 12866 directs Federal agencies to promulgate new regulations or modify existing regulations only if the potential benefits to society outweigh the potential costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Finally, the Office of

Management and Budget directs agencies to assess the effects of regulatory changes on international trade. In conducting these analyses, the FAA has determined that this regulation: (1) would generate benefits exceeding costs and is neither major as defined in the Executive Order nor significant as defined in DOT's Policies and Procedures; (2) would not have a significant impact on a substantial number of small entities; and (3) would not have a negative impact on international trade. These analyses, available in the docket, are summarized below.

#### Regulatory Evaluation Summary

The following discussion of costs and benefits is provided because the proposed procedures would be explicitly incorporated into formal regulations. By administrative policy (Action Notice A8110.23, Procedures for Developing the Type Certification Basis for Derivative Aviation Products), the FAA has obtained agreements that certain changed products would comply with selected amendments that were adopted after the initial application for type certification of the base product. It is likely that such administrative decisions would continue, to some unknown degree for an unknown proportion of type certificated products, in the absence of the proposed regulation.

The proposed regulation would not initiate a specific certification standard or regulation per se, but instead, would formally alter the manner in which existing and future standards would be determined to be applicable. As a result, the FAA can describe, but is not able to quantify, the costs and benefits of the proposal. A quantification of the impacts would require a forecast of potential future changes to all commuter and transport category airplane models; all rotorcraft; and all other categories of regulated aircraft, aircraft engines, and propellers. In addition, a quantified evaluation would require a review of all applicable regulations that have been adopted during the intervening period after the type certification of the product, plus engineering appraisals of the intended changes for each product, the effects of those changes on other systems and components, and the economics associated with bringing each affected system and

component up to the standards of the intervening regulations. No reasonable estimate of these factors can be made.

In addition to the absence of a comprehensive estimate, no examples of such cost estimates are available for this evaluation. In some instances, manufacturers of changed products have complied with later regulations. In association with these actions, individual manufacturers of proposed changed products have evaluated the costs and benefits that would be incurred to meet the pertinent standards. Due to competitive economic considerations, however, such information is considered proprietary and is not available.

The attributable costs of this proposal are the incremental costs that would be incurred to meet any additional or more stringent standards, adopted after the application for type certification of the initial product, that would not be required in the absence of this proposal. Similarly, the direct benefit of the proposal is the augmented safety that would result from meeting such standards. Although the attributable costs and benefits cannot actually be quantified, certain safeguards have been included in the proposed regulation so that any actions taken pursuant to it would be cost beneficial.

As noted in the description of the proposal, for any proposed change, compliance with later regulations would not be required (1) for a change that is determined not to be significant, (2) for those areas or components not affected by the change, or (3) where compliance with later regulations would be impractical or would not contribute materially to the level of safety. Although a formal cost-benefit analysis is not intended, compliance with later amendments would be considered impractical if the applicant can show that such compliance would result in costs that are not commensurate with the possible safety benefits.

Further guidance on the definition of what constitutes a significant change would be provided in an advisory circular. The proposed circular would include a procedure for evaluating the practicality of applying later regulations in establishing the certification basis for a changed product. It is intended that the procedure would aid the engineering judgment of a team of

technical experts in evaluating the relative merits of applying later regulatory actions. The procedure would compare a safety index to a resource index to determine whether a particular changed product should comply with later regulatory changes.

The safety index would measure: (1) the seriousness of the consequences of the hazard that the later regulations address, (2) the projected frequency of those consequences, and (3) the expected incremental effectiveness of the later standards in addressing this hazard for the changed product in question. The resource index would gauge: (1) the incremental labor and capital equipment necessary for compliance, (2) the effect on scrap parts and part interchangeability, and (3) the potential increase in operating costs or reduction in revenue or utility.

In addition to the benefits of any individual action taken pursuant to the proposed regulation, the proposal would also generate procedural benefits. 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 addition, the proposed procedures have been harmonized with the aviation authorities of Canada and Europe and the resulting common standards would reduce the costs and delays necessary to formally determine and fulfill dissimilar international requirements.

Although the attributable costs and benefits of the proposed regulation cannot be quantified, the FAA believes that it would be cost beneficial.

#### Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a Regulatory Flexibility Analysis if a proposed regulation would have a significant economic impact, either detrimental or beneficial, on a substantial number of small

entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, establishes threshold cost values and small entity size standards for complying with RFA review requirements in FAA rulemaking actions. The proposed amendments would not have a significant economic impact on a substantial number of small entities.

#### Trade Impact Assessment

The proposed regulation would not constitute a barrier to international trade, including the export of American goods and services to foreign countries and the import of foreign goods and services into the United States. Instead, the proposed type certification procedures for changed products have been harmonized with those of foreign aviation authorities and would lessen the restraints on trade.

#### **Federalism Implications**

The regulations proposed herein will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

#### **Conclusion**

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Analysis, the FAA has determined that this proposed regulation is not a significant regulatory action under Executive Order 12866. In addition, the FAA certifies that this proposal, if adopted, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This proposal is considered nonsignificant under DOT Regulatory

Policies and Procedures (44 FR 11034; February 26, 1979). An initial regulatory evaluation of the proposal, including a Regulatory Flexibility Determination and International Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

### **List of Subjects**

14 CFR part 11

Administrative practice and procedure reporting

14 CFR part 21

Aircraft, Aviation safety, Safety, Type certification

14 CFR 25

Aircraft, Aviation safety, Safety, Type certification

## **THE PROPOSED AMENDMENTS**

Accordingly, the FAA proposes to amend 14 CFR parts 11, 21, and 25 as follows:

### **PART 11 -- GENERAL RULE-MAKING PROCEDURES**

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

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

2. The first sentence of § 11.11 is revised 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: (a) Proposals, (b) notices of proposed rulemaking, (c) written material received in response to notices, (d) petitions for rulemaking and exemptions, (e) written material received in response to summaries of petitions

for rulemaking and exemptions, (f) petitions for rehearing or reconsideration, (g) petitions for modification or revocation, (h) notices denying petitions for rulemaking, (i) notices granting or denying exemptions, (j) summaries required to be published under § 11.27, (k) special conditions required as prescribed under §§ 21.16 or 21.101(c), (l) written material received in response to published special conditions, (m) reports of proceedings conducted under § 11.47, (n) notices denying proposals, and (o) 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:** 49 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) Except as provided in paragraph (b) of this section, an applicant for a change to a type certificate must show that the changed product complies with:

(1) Each regulation in parts 23, 25, 27, 29, 31, 33, and 35 of this chapter that is applicable to the changed product and that is in effect on the date of the application for the change; and

(2) Parts 34 and 36 of this chapter.

(b) The applicant may show that the changed product complies with an earlier amendment of a regulation required by paragraph (a)(1) of this section, and any other regulation the Administrator finds is directly related, 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:

(1) For a change the effect of which, combined with all previous relevant changes, the Administrator finds is nonsignificant;

(2) For each area, system, component, equipment, or appliance that the Administrator finds is not affected by the change; and

(3) For each area, system, component, equipment, or appliance that is affected by the change, if the Administrator also finds that compliance with a regulation described in paragraph (a)(1) of this section would be impractical or would not contribute materially to the level of safety of the changed product.

(c) 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.

(d) 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 it is clear that it will not be approved under the time limit established under this paragraph, the applicant may --

(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; or

(2) File for an extension of the original application and comply with the provisions of

paragraph (a) of this section for an effective date of application, to be selected by the applicant, not earlier than the date that precedes the date of approval of the change by the time period established under this paragraph for the original application for the change.

6. Paragraph (a) of § 21.115 is revised to read as follows:

**§ 21.115 Applicable requirements.**

(a) Each applicant for a supplemental type certificate must show that the altered product meets applicable 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.

\* \* \* \* \*

**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. Paragraph (c) of § 25.2 is revised to read as follows:

**§ 25.2 Special retroactive requirements.**

\* \* \* \* \*

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

{PRIVATE } Issued in Washington, DC, on {tc \l 1 " }  
Issued in Washington, DC, on " }

To: Lyle Davis  
From: Carey Terasaki  
Re: ICPTF A.C., Appendices 2 and 3

6277

The following are my comments.

1. With respect to the Resource Index in Appendix 2 (Paragraph 1.b), my comments from my October 1993 memo still apply.

As I stated earlier, I non-concur with the draft Exemplary Procedure for Evaluating the Certification Basis for a Changed Product in Appendix 2. Notwithstanding that it would be up to an FAA lawyer to demonstrate the validity of the procedure based on the expert opinions of the FAA economists, my understanding of mathematics and certification regulations leads me to independently conclude that the FAA could not so demonstrate. (The fact that Don Glasco agrees merely confirms that conclusion.)

I agree that the working group has not sufficiently answered the relevant questions. Why are there 5 levels of effectiveness of actions (Table 2.1), and not more or fewer? How do the stated subjective descriptions evenly differentiate those levels? Why are the terms in Table 2.2 limited to those items? Why don't they include more? Why is the 1-4-20-100 point scale in Table 2.2 appropriate? Why not 1-5-25-50? Or something else? How do the subjective descriptions in Table 2.2 dictate the 1-4-20-100 scale? Why those percentages in Operating Cost Increase and Revenue or Utility Loss? Why the logarithmic function in the first graph in Figure 2.1? Why not a linear function or another function? Why are the slopes of the lines as drawn? Why not steeper or flatter? Why are the differences in the Levels of Effectiveness lines not equal? Why should they be as far apart as they are? Why is the Marginal band in the last graph that wide? Why not wider or narrower? What justifies the slope of the lines that bound the Marginal band? Why aren't the Safety Indices shifted left or right? Why isn't the resource index shifted up or down?

The answer that they just came out that way does not justify stating that the procedure IS an acceptable means of COMPLIANCE, especially in the context of a new design, i.e., the kind of certification project not yet contemplated by the group.

2. With respect to Appendix 3, I note that the group continues to be married to the concept of "applicable service experience EQUALS certification basis." I continue to disagree. As a matter of law, that is false as many times as it is true. For example, thrust reversers; having them rarely deploy inadvertently is not equal to ensuring that the airplane is controllable after inadvertent deployment. Also, service experience many times is the product of a manufacturer's conservative design approach, not the minimum level of safety embodied in the certification basis; in that case, the design is more likely to be able to be demonstrated to comply with the later amendment.

“Loss of good Experience.” Would not the applicant have to do a reliability analysis of a new system required for a later amendment? Would that not show whether the new system would result in a “loss?” (If so, it would probably mean that the new system DOESN'T comply with the latest (applicable) certification regulations.)

Example, Paragraph 3. Why does the title refer to a “Reversion” to an earlier amendment? The applicant can't go further back than the original certification basis.

The Amendment 25-23 example (25.671(c)(3)) implies an incorrect concept of the proposed rule. That later amendment allows compliance by using an “extremely improbable” demonstration. If the existing design is really reliable, the applicant should be able to demonstrate “extremely improbable,” i.e., can show compliance with the later amendment. (Otherwise, compliance WOULD contribute materially to the level of safety.)

cc: Don Glasco  
Jeanne Trapani

## FAA Action

necessary for the proper performance of the functions of the Department, including whether the information will have practical utility; the accuracy of the Department's estimate of the burden of the proposed information collection; ways to enhance the quality, utility and clarity of the information to be collected; and ways to minimize the burden of the collection of information on respondents, including the use of automated collection techniques or other forms of information technology.

Issued in Washington, DC, on April 29, 1997.

**Vanester M. Williams,**

*Clearance Officer, United States Department of Transportation.*

[FR Doc. 97-11480 Filed 5-1-97; 8:45 am]

BILLING CODE 4910-62-P

#### DEPARTMENT OF TRANSPORTATION

##### Aviation Proceedings, Agreements Filed During the Week of April 18, 1997

The following Agreements were filed with the Department of Transportation under the provisions of 49 U.S.C. 412 and 414. Answers may be filed within 21 days of date of filing.

*Filing Date:* 4-17-97

*Docket Number:* OST-97-2360

*Description:* International Air Transport Association, David M. O'Connor, Director, External Relations—U.S., 1001 Pennsylvania Ave., NW., #285, Washington, DC 20004

Telex PTC3 Mail Vote 867 Osaka-Cheongju fares r1-9

Intended effective date: April 29, 1997

r-1-043d r-5-076LL

r-2-053d r-6-081tt

r-3-063d r-7-090kk

r-4-063dd r-8-092hh

r-9-092t

**Paulette V. Twine,**

*Chief, Documentary Services.*

[FR Doc. 97-11435 Filed 5-1-97; 8:45 am]

BILLING CODE 4910-62-P

#### DEPARTMENT OF TRANSPORTATION

##### Aviation Proceedings, Agreements Filed During the Week of April 25, 1997.

The following Agreements were filed with the Department of Transportation under the provisions of 49 U.S.C. 412 and 414. Answers may be filed within 21 days of date of filing.

*Docket Number:* OST-97-2370.

*Date Filed:* April 21, 1997.

*Parties:* Members of the International Air Transport Association.

*Subject:*

CAC/Reso/187 dated April 14, 1997

Expedited Cargo Agency Resolutions r1-3

Intended effective date: June 1, 1997

r-1-801r

r-2-813

r-3-813e

**Paulette V. Twine,**

*Chief Documentary Services.*

[FR Doc. 97-11482 Filed 5-1-97; 8:45 am]

BILLING CODE 4910-62-P

#### DEPARTMENT OF TRANSPORTATION

##### Notice of Applications for Certificates of Public Convenience and Necessity and Foreign Air Carrier Permits Filed Under Subpart Q During the Week Ending April 25, 1997

The following Applications for Certificates of Public Convenience and Necessity and Foreign Air Carrier Permits were filed under Subpart Q of the Department of Transportation's Procedural Regulations (See 14 CFR 302.1701 *et seq.*). The due date for Answers, Conforming Applications, or Motions to modify Scope are set forth below for each application. Following the Answer period DOT may process the application by expedited procedures. Such procedures may consist of the adoption of a show-cause, a tentative order, or in appropriate cases a final order without further proceedings.

*Docket Number:* OST-97-2372

*Date Filed:* April 22, 1997

*Due Date for Answers, Conforming Applications, or Motion to Modify Scope:* May 20, 1997

*Description:* Application of Delta Air Lines, Inc. pursuant to 49 U.S.C. Section 41102, and Subpart Q of the Regulations, applies for a new or amended certificate of public convenience and necessity to authorize it to provide scheduled foreign air transportation from a point or points in the United States via intermediate points to Arica, Antofagasta, and Santiago, Chile, and beyond; and

Requests destination and allocation of seven (7) U.S.-Chile frequencies available for U.S.-Chile combination services, for a term of five (5) years.

**Paulette V. Twine,**

*Chief, Documentary Services.*

[FR Doc. 97-11481 Filed 5-1-97; 8:45 am]

BILLING CODE 4910-62-P

#### DEPARTMENT OF TRANSPORTATION

##### Federal Aviation Administration

##### Type Certification Procedures for Changed Products

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

**ACTION:** Notice of availability for public comment.

**SUMMARY:** This notice announces the availability of and requests comments on the proposed advisory circular (AC), Advisory Material for the Evaluation of the Certification Basis of Changed Aeronautical Products, pertaining to the type certification procedures for changed products. Elsewhere in this edition of the **Federal Register**, the FAA has issued a Notice of Proposed Rulemaking (NPRM), Type Certification Procedures for Changed Products, which would revise certain sections in part 21 of Title 14 of the Code of Federal Regulations. This proposed AC provides guidance for determining compliance with those proposed sections.

**DATES:** Comments must be identified by the name of the AC and be received on or before September 2, 1997.

**ADDRESSES:** Send all comments on this proposed AC to: Certification Procedures Branch, AIR-110, Aircraft Engineering Division, Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591, or deliver comments to room 815 at the same address.

**FOR FURTHER INFORMATION CONTACT:** Lyle C. Davis, Certification Procedures Branch (AIR-110), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267-9588.

##### SUPPLEMENTARY INFORMATION: Comments Invited

Interested persons are invited to comment on the proposed AC listed in this notice by submitting such written data, views, or arguments as they may desire. Comments received on the proposed AC may be examined, before and after the comment closing date, in Room 815, FAA Headquarters Building (FOB-10A), 800 Independence Avenue, SW., Washington, DC 20591, weekdays, except Federal holidays, between 8:30 a.m. and 4:30 p.m. By separate notice, in this edition of the **Federal Register**, the FAA is also inviting interested persons to comment on the notice of proposed rulemaking. The FAA will consider comments from this notice and comments received on the notice of

proposed rulemaking in deciding the nature of final action on each.

#### Background

New procedural regulations are being proposed in a Notice of Proposed Rulemaking, Type Certification Procedures for Changed Products, as a result of a trend towards fewer products that are of such significantly new design that a new type certificate is required. This proposal would require the starting point for determining the certification basis for an amended or supplemental type certificate to be the regulations in effect at the date of the application for the change, rather than those regulations incorporated by reference in the type certificate. Exceptions would be provided to permit the applicant, under certain conditions, to comply with previous amendments to those regulations.

#### Advisory Circular

This AC provides guidance for the applicant to comply with the regulations proposed in the Notice of Proposed Rulemaking, Type Certification Procedures for Changed Products.

#### Proposed § 21.101(b)(3): Determining Whether Compliance Would Not Materially Contribute to the Level of Safety of the Changed Product or Would Be Impractical

Proposed § 21.101(b)(3) states that an applicant's changed product may be shown to comply with an earlier amendment to a regulation in effect on the date of the application for the change, if compliance with that later regulation would not materially contribute to the level of safety of the changed product or would be impractical.

Parts of the associated NPRM published in this edition of the **Federal Register**, and parts of this proposed AC, resulted from a recommendation from the Aviation Rulemaking Advisory Committee (ARAC). Appendix 2 of this proposed AC contains a "safety benefit—resource evaluation guide," which was recommended by the ARAC. As explained in the introduction to Appendix 2, the FAA has declined to include the safety benefit—resource evaluation guide as a means of compliance with proposed § 21.101(b)(3). However, the ARAC-recommended guide does describe some of the issues that should be considered in making a case about complying with the later regulations under proposed § 21.101(b)(3). Thus, it is being proposed for inclusion for information purposes. An applicant seeking

approval of a changed aeronautical product can review this guidance prior to developing an argument that compliance with a regulation in effect at the date of the application for the change would be impractical. In using a similar guide, an applicant would have to demonstrate how his charts, values, and graphs demonstrate compliance with the proposed section.

For the procedure in Appendix 2, the points on the charts represent the mean derived from the experience of a number of engineers who have been involved in certification programs. The numbers on the charts were adjusted to reflect a review of several alternations of air carrier transport category airplanes, with respect to the revision of part 25.

Issued in Washington, DC, on April 22, 1997.

Ava L. Mims,

Acting Director, Aircraft Certification Service.  
[FR Doc. 97-11206 Filed 5-1-97; 8:45 am]

BILLING CODE 4910-13-M

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### Approval of Noise Compatibility Program; Boise Air Terminal, Boise, ID

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice.

**SUMMARY:** The Federal Aviation Administration (FAA) announces its findings on the noise compatibility program submitted by the Airport Director of the Boise Air Terminal under the provisions of Title I of the Aviation Safety and Noise Abatement Act of 1979 (Pub. L. 96-193) and 14 CFR part 150. These findings are made in recognition of the description of Federal and non-Federal responsibilities in Senate Report No. 96-52 (1980). On September 18, 1996, the FAA determined that the noise exposure maps submitted by the Airport Director under Part 150 were in compliance with applicable requirements. On March 17, 1997, the Associate Administrator for Airports approved the Boise Air Terminal noise compatibility program. Twenty of the twenty-three program measures were approved. Two were disapproved for purposes of Part 150 because they permit continued noncompatible development in an established noise contour, even though they are at lower densities. One measure was partially approved because it contains a zoning segment that is not related to reducing or preventing noncompatible land uses.

**EFFECTIVE DATE:** The effective date of the FAA's approval of the Boise Air Terminal noise compatibility program is March 17, 1997.

**FOR FURTHER INFORMATION CONTACT:** Dennis G. Ossenkop; Federal Aviation Administration; Northwest Mountain Region; Airports Division, ANM-611; 1601 Lind Avenue, SW., Renton, Washington, 98055-4056. Documents reflecting this FAA action may be reviewed at this same location.

**SUPPLEMENTARY INFORMATION:** This notice announces that the FAA has given its overall approval to the noise compatibility program for Boise Air Terminal, effective March 17, 1997. Under Section 104(a) of the Aviation Safety and Noise Abatement Act of 1979 (hereinafter referred to as "the Act"), an airport operator who has previously submitted a noise exposure map may submit to the FAA a noise compatibility program which sets forth the measures taken or proposed by the airport operator for the reduction of existing noncompatible land uses and prevention of additional noncompatible land uses within the area covered by the noise exposure maps. The Act requires such a program to be developed in consultation with interested and affected parties including the state, local communities, governmental agencies, airport users, and FAA personnel.

Each airport noise compatibility program developed in accordance with Federal Aviation Regulation (FAR) Part 150 is a local program, not a Federal program. The FAA does not substitute its judgement for that of the airport proprietor with respect to which measures should be recommended for action. The FAA's approval or disapproval for FAR Part 150 program recommendations is measured according to the standards expressed in Part 150 and the Act and is limited to the following determinations:

a. The noise compatibility program was developed in accordance with the provisions and procedures of FAR Part 150;

b. Program measures are reasonably consistent with achieving the goals of reducing existing noncompatible land uses around the airport and preventing the introduction of additional noncompatible land uses;

c. Program measures would not create an undue burden on interstate or foreign commerce, unjustly discriminate against types or classes of aeronautical uses, violate the terms of airport grant agreements, or intrude into areas preempted by the Federal Government; and

**[4910-13]**

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**[14 CFR Parts 11, 21, and 25]**

**[DOCKET No. 28903; Notice No. 97-7]**

**RIN 2120-AF68**

**Type Certification Procedures for Changed Products**

**AGENCY:** Federal Aviation Administration (FAA), DOT

**ACTION:** Notice of proposed rulemaking (NPRM)

**SUMMARY:** This document proposes to amend the procedural regulations for the certification of changes to type certificated products. The amendments are needed to address the trends toward fewer products that are of completely new design and more products with repeated changes of previously approved designs. Safety would be enhanced by applying the latest airworthiness standards, to the greatest extent practicable, for the certification of design changes of aircraft, aircraft engines, and propellers.

**DATES:** Comments must be received on or before September 2, 1997.

**ADDRESSES:** Comments on this proposal must be mailed in triplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-200, Docket No. 28903, 800 Independence Avenue SW, Washington, DC 20591, or delivered in person to room 915G at the same address. Comments may also be submitted electronically to the following Internet address: 9-NPRM-CMTS@faa.dot.gov. Comments submitted must be marked: Docket No. 28903. Comments may be inspected in room 915G weekdays, except Federal holidays, between 8:30 am and 5:00 pm.

**FOR FURTHER INFORMATION CONTACT:** Lyle C. Davis, Certification Procedures Branch (AIR-110), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, telephone (202) 267-9588.

## **SUPPLEMENTARY INFORMATION:**

### **Comments Invited**

Interested persons are invited to participate in the proposed rulemaking by submitting such written data, views, or arguments as they may desire. Commenters should identify the regulatory docket or notice number and submit comments in triplicate to the Rules Docket at the address specified above. All comments will be considered by the Administrator before action on the proposed rulemaking is taken. The proposals contained in this notice may be changed in light of the comments received. All comments will be available in the Rules Docket, both before and after the closing date for comments, for examination by interested persons. A report summarizing each substantive public contact with Federal Aviation Administration (FAA) personnel concerning this rulemaking will be filed with the docket. Commenters wishing the FAA to acknowledge receipt of their comments must submit with those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 28903." The postcard will be dated and time stamped and returned to the commenter.

### **Availability of NPRMs**

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the Fedworld electronic bulletin board service (telephone: 703-321-3339), the Federal Register's electronic bulletin board service (telephone: 202-512-1661), or the FAA's Aviation Rulemaking Advisory Committee Bulletin Board service (telephone: 202-267-5948).

Internet users may reach the FAA's web page at <http://www.faa.gov> or the Federal Register's web page at [http://www.access.gpo.gov/su\\_docs](http://www.access.gpo.gov/su_docs) for access to recently published rulemaking documents.

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Rulemaking,

ARM-1, 800 Independence Avenue SW, Washington, DC 20591; or by calling (202) 267-9680. Communications must identify the notice number or docket number of this NPRM.

Persons interested in being placed on the mailing list for future NPRM's 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.

## **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 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 are of such significantly new design that a new type certificate is required. 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 substantial differences from the original product. As a result, many newly manufactured aeronautical products are not being required to comply with the more recent airworthiness standards. The procedural regulations need to be changed to correspond with this trend toward fewer new type certificates.

### **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 and revising 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, and propellers. The FAA may prescribe in any such certificates the duration of the certificate, and the terms, conditions, and limitations as required in the interest of safety.

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.

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 at 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 obligation of the FAA, 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, as yet, not 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; and

(4) To allow flexibility in design. Wherever possible, the airworthiness standards of 14 CFR Chapter 1, subchapter C, are intentionally objective in nature, and the procedural regulations permit design changes over the operational life of a product.

Originally, the FAA would issue special conditions informally as an interpretation of the "no unsafe feature or characteristic" regulations; however, in 1967, the FAA formalized the process with the adoption of § 21.16. As provided in that section, special conditions are issued as regulations in accordance with public comment provisions of 14 CFR part

11 (part 11). The adoption of § 21.16 extended the special condition process to include aircraft engines and propellers. The provision in § 21.21(b)(2), that a type certificate would be issued for an aircraft only if no unsafe feature or characteristic existed, remained unchanged.

The phrase "novel or unusual" is used in describing design features for the issuance of special conditions under the provisions of § 21.16. These design features involve a state of technology not considered for the applicable airworthiness standards at the time they were written; in some areas, the state of the regulations may lag the state of the art of new designs. This disparity is due to both the rapidity in which the state of the art is advancing in civil aeronautical design and the need to develop a sufficient experience base with new technology before proceeding with general rulemaking. Therefore, there may be instances in which special conditions are required for design features considered "state of the art" in the aircraft industry. Conversely, many new design features that might be thought of as "novel or unusual" in the context of the product's original certification basis may already be covered by existing regulations, thereby obviating the need to issue special conditions. This fact is recognized in existing § 21.101(b)(1).

For example, in 1980, the holder of a small airplane type certificate who installed turboprop engines in place of reciprocating engines did so by complying with appropriate later regulations. Because appropriate regulations were available for the installation of turboprop engines, special conditions were not issued for installation of the engines. These changes were made through the FAA issuing an amendment to the type certificate originally issued in 1964. The airworthiness regulations, part 23, were changed to accommodate turboprop engines in 1969.

Special conditions are not issued for general upgrading of the applicable airworthiness standards to achieve a higher level of safety. Whenever the FAA concludes that a compelling need exists for a higher level of safety in type designs, rulemaking is proposed in accordance with

the general rulemaking procedures of part 11, the Administrative Procedure Act, and Executive Order 12866. Finally, §§ 23.2, 25.2, 27.2, and 29.2 provide retroactive regulations in the airworthiness standards. A complete statement of the FAA intent with respect to the application of special conditions is found in the preamble to amendment 51 to Part 21, (45 FR 60154, September 11, 1980). That intent is in no way changed by the proposals herein.

Sometimes new airworthiness standards contain provisions that, in the interest of safety, should be applied retroactively to existing aircraft. Typically this is accomplished by proposing changes to 14 CFR parts 121 and 135, and sometimes part 91, through rulemaking procedures.

### **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. Prior to the early 1940's, an applicant for a changed product, such as an airplane with an alternate engine installation, was required to apply for a new type certificate. The regulations in effect prior to the early 1940's required an applicant for a changed product to apply for a new type certificate for a change such as an alternate engine installation. When a new type certificate was required, the applicant had to 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 a period of time. The then current standards were, therefore, essentially the same as those with which the original product had to comply. Later, more rapid changes in technology resulted in significant changes in the airworthiness standards over relatively short periods of time. An applicant for a type certificate for a changed product could thus be faced with complying with airworthiness standards that varied considerably from those with which

the original product complied. In some instances, the differences in standards could be so great that an applicant would be discouraged from making any changes, including changes that would, in themselves, contribute to the safety of the product. To relieve this situation, by the early 1940's, an application for a new type certificate was required only if the change was extensive.

Section 21.19(a) requires a new type certificate when a change is considered so extensive that a substantially complete investigation of compliance with the regulations is required. In addition, §§ 21.19(b), (c), and (d) provide specific types of changes that require an application for a new type certificate because those types had already been determined to be substantial per § 21.19(a). For a normal, utility, acrobatic, commuter, or transport category aircraft, paragraph (b) requires a new aircraft type certificate if the proposed change is (1) in the number of engines or rotors, or (2) to engines or rotors using different principles of propulsion or to rotors using different principles of operation. Similarly, paragraph (c) requires a new engine type certificate if the proposed change is in the engine's principle of operation, and paragraph (d) requires a new propeller type certificate if the proposed change is in the number of blades or in the principle of pitch change operation.

The basis for § 21.19(b)(1) originated in the early 1950's following the issuance of an amended type certificate to an applicant who altered a popular single-engine, four-passenger, light airplane into a twin-engine model. Although that conversion was approved by an amendment to the original type certificate, the agency recognized that the conversion from one to two engines added considerable complexity to the airplane and greatly affected its handling characteristics. Therefore, the predecessor of § 21.19(b)(1) was adopted requiring a new type certificate for a change in the number of engines or rotors. The regulatory language was broad enough in scope to include any change in the number of engines or rotors

whether such changes would simplify or add complexity to the type design.

The FAA does not require an applicant to apply for a new type certificate to add small auxiliary engines to an aircraft. In the 1960's, with the development of small turbojet engines to be used as auxiliary engines, the FAA defined a jet engine that develops less than 50 percent of the static thrust developed by one of the primary propulsion engines as an auxiliary engine. The FAA considers the "number of engines" as used in § 21.19(b)(1) to refer to the number of primary propulsion engines and not to any auxiliary engines to be installed. The FAA has issued a large number of exemptions from the regulation concerning a change in the number of engines.

Prior to 1957, predecessors of current § 21.19(b)(2) stated that an applicant must make a new application for type certificate if the proposed change was to engines employing different principles of operation or propulsion. This meant that an applicant desiring to replace reciprocating engines with the same number of turbopropeller engines would have to apply for a new type certificate. During that period, it was recognized that considerable advances in safety, reliability, and passenger comfort could be realized by replacing reciprocating engines in certain transport category airplanes with turbopropeller engines. In order to encourage such beneficial changes, the reference to different principles of operation was deleted in 1957 for transport category airplanes. As a result, an applicant may be granted approval for a conversion of this nature without applying for a new type certificate providing the applicant complies with certain later standards applicable to turbine-powered airplanes. In the broadest sense, all powered airplanes achieve propulsion by accelerating a mass of air and/or exhaust gases. In the narrower context of § 21.19(b)(2), however, "principles of propulsion" means propeller-driven versus turbojet.

Section 21.19(b)(2) also states that an applicant must make a new application for a type certificate if the proposed change is to rotors employing different principles of operation or propulsion. The FAA is not aware of any instance in which this specific section was the basis for requiring an application for a new type certificate; any change of this nature, together with all related changes, would have been so extensive that a new type certificate would have been required under the provisions of § 21.19(a).

The FAA has never granted any exemptions from the regulation for a new aircraft type certificate for a change to engines or rotors using different principles of propulsion. Similarly, no exemptions have been granted from the engine or propeller type certificate regulations for changes involving the principle of engine operation, for changes in the number of propeller blades, or for changes in the principle of pitch change operation.

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 at 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. They are frequently referred to as the "original certification basis."

If an applicant chooses to show compliance with the regulations in effect at 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 be amended to become less stringent, but a related regulation may become more stringent. In a situation of this nature, the applicant must also comply with the related compensating regulation as well. 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 entire product, as altered, not just that the change itself, complies with the 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.

Section 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 at 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 at the date of the application. When regulations in effect at 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 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 result collectively in a product with substantial differences from the original product.

For example, one model originally manufactured as a normal category airplane with two reciprocating engines has been changed through a series of alterations to incorporate turbopropeller engines, a stretched and heightened fuselage, a tricycle landing gear, a modified wing planform and a 42 percent increase in maximum takeoff weight. In this particular case, the majority of changes were made through the FAA's issuing supplemental type certificates to modifiers other than the type certificate holder. However, the type certificate holder could have made the same incremental changes without applying for a new type certificate each time.

In another instance, a type certificate holder effected significant changes in the design of a turbojet transport category airplane without obtaining a new type certificate by making a series of changes to its existing type certificate. Each incremental change, by itself, was determined not to be so extensive as to require a new type certificate under § 21.19(a). This airplane evolved into a configuration approximately 40 percent greater in fuselage length and with a 92 percent greater maximum takeoff weight than the original model. These changes, which have been incorporated into newly manufactured airplanes, are possible because the FAA issued amendments to the type certificate.

Another trend in manufacturing is to keep products in production over several decades. Some currently manufactured transport category

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 comply with 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 that 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. This is one reason why, as stated before, 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 an amended 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 is not only unreasonably costly but may 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. Thus, it is common place that products in service today possess a level of safety significantly greater than that embodied in their certification basis.

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 where the new standards were issued to address a deficiency in the design in question or where 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.

It can be argued, for consistency, that new airworthiness standards should apply across the board to the entire aircraft fleet; however, application of new standards would not be practicable 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. 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 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 deemed that a 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 and/or airplanes in service to comply retroactively 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 manufactured airplanes were required for the existing fleet and were implemented in the operating regulations, such as part 121.

In 1965, the FAA granted an exemption from the provisions of § 21.19(b)(1) to permit conversion of a four-engine amphibian to a twin-engine configuration without the applicant applying for a new type certificate. During the 1980's, three applicants petitioned for exemptions from the above regulations so they could convert Boeing 727 airplanes from the original three-engine configuration to ones with two engines without having to apply for new type certificates. Another applicant petitioned for a similar exemption to replace the four engines of a Lockheed 1329 Jetstar aircraft with two engines of more recent vintage. The FAA granted each exemption with the condition that the petitioner comply with the provisions of then current part 25 in all areas, systems, components, equipment, or appliances affected by the conversion.

The FAA also granted a number of exemptions that permitted increasing the number of engines without the need for the applicants to obtain new type certificates. In 1985, an applicant received an exemption to replace two reciprocating engines in Grumman Albatross amphibians with four turbopropeller engines without having to obtain a new type certificate. In granting the exemption, the FAA concurred that the alteration should improve the Albatross by increasing safety, increasing powerplant reliability, and improving overall aircraft efficiency. The exemption noted that compliance with § 21.19(b)(1) would have required changes to some basic systems that had provided satisfactory performance for many years and had contributed to the safety record of those airplanes. Applying then-current regulations to components and systems not affected by the installation of the four engines would have been time consuming and costly, and would not necessarily have contributed any

safety benefits. As with the exemptions to reduce the number of engines, this exemption was granted with the condition that the petitioner comply with the provisions of then current part 25 in all areas, systems, components, equipment, or appliances affected by the conversion.

A similar exemption was also granted in 1989 to enable an applicant to increase the number of engines from one to two in certain Bell 206 series rotorcraft. The petitioner cited the increased safety afforded by a twin-engine configuration in the event a failure occurred during hover, and also the enhanced altitude performance. As a condition of the grant of exemption, the applicant was required to show that the altered rotorcraft complied with the standards of part 27 in effect at the date of application for the change for all areas, systems, equipment, or appliances that were changed or significantly affected by the change.

These exemptions point out an important feature that has been included in this proposed rulemaking. The number of engines is not, in itself, an appropriate criterion for requiring an application for a new type certificate as long as the type design complies with the regulations effective at the date of the application for the change in those areas changed or affected by the change.

### **Recent FAA Actions**

Apart from safety considerations, 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, the FAA participated in the activities of 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, Aerospace Industries Association of America, Air Transport

Association of America, General Aviation Manufacturers Association, International Air Transport Association, Association Europeenne des Constructeurs de Materiel Aerospacial, 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 consists 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 an NPRM and associated advisory material concerning the type certification procedures for changes to aeronautical products, newly manufactured products, and products already in service. ARAC, in turn, submitted these documents as recommendations to the FAA. The FAA recognizes the difficult task

the working group undertook in the effort to address the issues in this proposed rule and in the advisory material. Much of the work done within the working group could not have been accomplished without the assistance of working group members representing the aviation community. The rulemaking proposed by the FAA in this notice reflects the ARAC recommendations in the type certification procedures for changed products with only minor changes. Similar proposed changes have been published by the Joint Aviation Authorities.

### **FAA's Proposed Policy on Changed Products**

The FAA intends to require that applicants for changes to type certificated products show compliance with the latest amendments to the airworthiness standards that are applicable to the product being changed. Exceptions to requiring a showing of compliance with the later amendments would be provided to accommodate variations in the kinds of type certificated products, of changes to these type certificated products, and revisions of the airworthiness standards. These exceptions would permit compliance with regulations issued prior to the regulations in effect at the date of the application for the change.

This proposed rulemaking would amend the type certification procedures for changes to type certificated products to bring the certification basis for changed products and for newly type certificated products closer together. The intent is to ensure that when an essentially new product is developed through a series of changes, regardless of the extent of each change, the final product achieves a level of safety similar to that of a comparable new product. This concept will be tempered with the knowledge that a good design does not become unsafe as soon as a new regulation has been published.

Some differences may be acceptable between the certification basis for a product undergoing a change and the current regulations that would be applicable if a new product was being type certificated. This

acceptance would be based on whether there is a defined safety issue involved in the specific product.

The FAA is already encouraging applicants of certain type certificated products undergoing alterations to comply with later amendments of the airworthiness standards. By this rulemaking, the FAA proposes to require all proposed changes for all type certificated products to comply with later amendments of the airworthiness standards. The long term result of this approach will be that an amended type certificate 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.

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. By separate notice, in this issue of the Federal Register, the FAA is also inviting interested persons to comment on the proposed advisory circular. The FAA will consider comments from this notice and comments received on the advisory circular before taking any final action on either.

### **Discussion of the Proposed Rulemaking**

Sections 11.11, 21.19, 21.101, 21.115, and 25.2 would be amended as follows to implement the policy discussed above in relation to changes to products:

#### **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 proposed changes to § 21.101, described later, it is necessary to

amend § 11.11 to refer to § 21.101(c) instead of § 21.101(b)(2). This would not be a substantive change.

### **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. This sentence has caused confusion because it covers several types of changes for all products -- airplanes, rotorcraft, aircraft engines, and propellers. In addition, current paragraphs (b), (c), and (d) list other specific types of changes that mandate a new application for a type certificate. Only the general language of current paragraph (a) would be incorporated into the new § 21.19, while the previously listed specific changes would be subject to case-specific evaluations to determine whether they are substantial. Application of § 21.19 would depend upon an evaluation of whether the proposed change in "design, power, thrust, or weight" would necessitate a substantially complete investigation of the compliance of the changed product. Each of the following airplane design changes, considered alone, could typically be regarded as a substantial design change:

- (1) Change from a high wing to a low wing airplane, or vice versa;
- (2) Change of empennage configuration for larger airplanes (cruciform vs 'T' or 'V' tail);
- (3) Complete repositioning of engines (tail to wing, etc.); and
- (4) An increase in airplane design complexity resulting from an increase in the number of engines.

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 is required. Accordingly, the provisions of current § 21.19(b) are not needed and are not included in this proposal. The exemptions that have been granted from current § 21.19(b) have typically required that those areas, systems, components, equipment, and appliances that are changed or significantly affected by the change must comply with the applicable regulations in effect at the date of the application for that change. This requirement would be embodied in proposed § 21.101, which would generally require that an applicant for a change to a type certificate must comply with the regulations in effect at the date of the application for that change, with an exception, however, that those areas, systems, components, equipment, and appliances not affected by the change could continue to comply with the regulations incorporated in the reference type certification basis. Accordingly, this proposed amendment would be consistent with the exemptions that have been granted on changes in the number of engines. The need for requiring a new application for a type certificate would be alleviated in many instances by the proposed changes to § 21.101.

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. Also, current § 21.19(d) describes specific changes in which the applicant must apply for a new propeller type certificate. These changes are in the number of blades or principle of pitch change operation. Invariably, the type of changes set forth in both of these sections are so extensive that a new application would be required in any event because a complete investigation of

compliance is required. Accordingly, this proposal would 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 at the date of application for the change to the type certificate.

### **Section 21.101**

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 at the date of the application for the change, if elected by the applicant, plus any other amendments the Administrator finds to be directly related.

Current paragraph (b) 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. In this case the applicant must comply with the regulations in effect at 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." This means that the level of safety must be at least equal to the level of safety that was required by the regulations referenced in the type certificate.

To ensure that the products meet the latest airworthiness standards wherever practicable, proposed § 21.101 would specify that, with certain exceptions, the applicant for a change must comply with the applicable regulations in effect at the date of the application for the change. The intent of this proposal is to apply the applicable regulations in effect at the date of the application to those areas, systems, components, equipment, and appliances affected by the change. For those areas, systems, components, equipment, and appliances not affected by the

change, continued compliance with the regulations incorporated by reference in the type certificate is considered acceptable.

#### Section 21.101(a)

This proposed paragraph would require an applicant for a change to a type certificate to comply with the applicable regulations in effect at the date of the application for the change, also referred to as the later regulations, and with parts 34 and 36.

#### Section 21.101(b)

This proposed paragraph would provide exceptions to the regulation in proposed paragraph (a), permitting the applicant to comply with earlier amendments to the regulations. A "regulation" as used herein means individual paragraphs of the Federal Aviation Regulations or predecessor regulations. When choosing the amendment level of a regulation, all related regulations associated with that amendment level would have to be included. The amendment level chosen would not be allowed to predate either the existing basis or anything required by the retroactive sections, §§ 23.2, 25.2, 27.2, or 29.2. Design changes vary in both complexity and magnitude so it is necessary for each proposed change to be evaluated on a case by case basis, taking into account previous changes and their certification basis. Individual incremental changes may be modest; however, the cumulative effect can result in a significant overall change. In this context, the following factors should be considered: (1) the extent of the previous changes and the extent to which later amendments have been addressed for these individual changes; and (2) the extent of revisions to the airworthiness standards from those of the original certification basis of the model being changed. When an essentially new product is developed, step by step, through a series of non-substantial design changes, it should achieve a level of safety similar to that of a comparable new product.

Substantial changes are addressed in § 21.19. Those that are not substantial will be either nonsignificant or significant. A small weight increase or the installation of a flight management system is an example of a non-significant change. The installation of a cargo door is an example of a significant change. A change from a low wing to a high wing is an example of a substantial change.

In evaluating a design and making the final determination of nonsignificant or significant, under the exceptions provided for in § 21.101(b), the FAA would rely on documented engineering, safety, and economic data. Any data submitted by the applicant should have the same degree of thoroughness and engineering quality expected for initial compliance with airworthiness standards.

#### Section 21.101(b)(1)

This proposed paragraph would provide the first exception to the regulation in proposed paragraph (a), to show compliance with the later applicable regulations. The proposed paragraph would state that the applicant would be allowed to demonstrate compliance with earlier regulations, but not earlier than the regulations incorporated in the existing 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.

There may be concurrent significant and non-significant changes made to a product. For example, there may be a small change in the model of engines used at the same time large changes are made to the airframe. Each part of the total change would be evaluated to determine its significance on its own merit. It must be recognized, however, that a number of related non-significant changes may collectively represent a significant change to the product.

#### Section 21.101(b)(2)

This proposed paragraph would provide the second exception to the regulation in proposed paragraph (a), to show compliance with the later applicable regulations. The proposed paragraph would state that the applicant may show compliance with earlier regulations for those areas, systems, components, equipment, and appliances that are not affected by the change.

The FAA recognizes that arbitrarily requiring compliance with later regulations in areas, systems, components, equipment, and appliances not affected by the change may cause redesign of components that have an acceptable service record without an attendant improvement in safety, or may have the counterproductive effect of discouraging any changes at all, including those that would provide a notable improvement in safety.

#### Section 21.101(b)(3)

This proposed paragraph would provide the third exception to the regulation in proposed paragraph (a) to show compliance with the later applicable regulations. If compliance with a regulation in effect at 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.

Compliance with the later amendment would be considered to "not materially contribute to the level of safety" if the level of safety achieved by the existing design with the proposed design change would not be enhanced by compliance with that later amendment. In demonstrating this, the applicant would show that the level of safety achieved by the existing design incorporating the proposed design change would achieve a safety level similar to that reflected in the later amendment.

The factors that would be considered in comparing the level of safety achieved by the existing design incorporating the proposed design change with the level of safety achieved by compliance with the later amendment would include: whether the product has compensating design features; the extent that the service experience of the product shows that the operational performance and reliability of the product provides a level of safety similar to that of later amendments; and whether compliance with a later amendment, notably when it necessitates a redesign, would have an adverse effect on safety in terms of operational performance and reliability.

Nothing would limit the future operation or transfer of a product after a design change is approved with an older certification basis; furthermore, the intent of this proposal is to establish certification bases appropriate to the designs of the products and the designs of the changes. Therefore, if an applicant for a design change is changing one or two items of a product, and another applicant is making the same change to 100 items of the same product, the applicants' design changes should be certificated to the same basis.

Demonstrating that compliance with later regulations would not materially contribute to the level of safety could necessitate analyses of the safety features of the existing design and the proposed change, and an analysis of the safety concerns addressed by the relevant amendment. The evaluation may be accomplished using a numerical - statistical approach, subject to the availability and relevance of applicable data. In practice, engineering judgment, based on scientific, rational, and reasoned analysis of the relevant data, would be used in the development of this evaluation. The essentials of the evaluation would involve:

- a. A clear understanding of the regulatory change and what prompted the change;
- b. A detailed knowledge of the proposed design feature; and
- c. A comprehensive review of the applicable service experience.

An applicant may be unable to show that compliance with the original certification basis, together with the level of safety demonstrated by the applicable service experience, provides a level of safety similar to that of the later airworthiness regulations. If compliance with the later airworthiness regulations would then involve a design change, the benefits of such a redesign would be considered in the light of any possible adverse effects of the redesign on safety.

An applicant for a change to a type certificate would not be required to demonstrate that the changed product complies with a later amendment to an airworthiness standard if the applicant shows that such compliance would be "impractical." 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. Where compliance with the later amendment would prompt a redesign, the cost of redesigning other parts of the product to accommodate this redesign also would be considered.

The FAA continually weighs the desire for the maximum level of safety with the cost to the manufacturers, operators, and traveling public for achieving that level of safety. If the designer of an aircraft in development is tasked with incorporating a "change" to a system in that new design, the designer usually has many more options in making "changes" to related systems to accommodate the "change." Conversely, the systems related to a system to be changed in a certificated design have been established, and there may be few such options, if any. These restraints are exacerbated by a change in the certification basis, and the consideration of the service experience of the product. Under these conditions, it may become unreasonably costly for the change to comply with the latest standards.

A safety benefit - resource evaluation could be used to assist in determining impracticality, and would be discussed between the applicant

and the Administrator while establishing the certification basis. The economic issues associated with compliance with the later amended airworthiness standards would be a major portion of this evaluation.

Any safety benefit - resource evaluation used to determine "impractical" should evaluate the enhancement of the safety involved with complying with the airworthiness regulation under consideration along with the cost associated with this compliance. This evaluation would weigh the factors associated with the safety benefit and the factors associated with the cost of compliance.

The factors involved with the safety issue could include seriousness of the consequences of the hazard that the regulatory change addresses, frequency of those consequences, and the effectiveness of applying the regulatory change to the changed product. The factors involved with the cost of compliance could include labor, new capital equipment needed, materials, operating cost increase, and revenue loss. The agency is seeking comments on this concept of using "Impractical" as defined herein.

#### Associated Advisory Circular

The proposed associated advisory circular includes guidance for purposes of complying with the requirements of this proposed rule. This advisory circular also contains a safety benefit - resource evaluation guide, which was recommended by the ARAC to be an acceptable means of compliance with the exceptions of proposed § 21.101(b). As elsewhere in this edition of the Federal Register, the safety benefit - resource evaluation guide has been included in the draft advisory circular for purposes of information only. 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 this proposed rule.

### Section 21.101(c)

This proposed paragraph would contain the provisions of current § 21.101(b)(2) concerning special conditions. For consistency with the other proposed changes to § 21.101, this paragraph would state that an applicant for a change must comply with any special conditions, and amendments to those special conditions, if needed, that would provide a level of safety equal to that established by the regulations in effect at the date of the application for the change. The interpretation of "novel or unusual design features" shall be the same as present practice under current § 21.101(b)(2). The provisions of current § 21.101(b)(1), concerning the use of later regulations when the regulations incorporated by reference do not provide adequate standards with respect to the proposed change, would no longer be needed and would not be incorporated into the proposed regulation. This is because proposed § 21.101(a) would require the use of later regulations.

The provisions of current § 21.101(c), concerning the replacement of reciprocating engines with turbopropeller engines, are not incorporated into the proposed regulation. A change of this nature would be considered a significant change, and compliance with the regulations in effect at the date of application for the change, therefore, would be required.

### Section 21.101(d)

This proposed paragraph would state that an application for a change to a type certificate for a transport category aircraft would be effective for 5 years, and an application for a change to a type certificate for all other products would be effective for 3 years. These proposed effectivity periods for an application are the same as those in current § 21.17(c) and (d) for an application for a type certificate. Because current § 21.101 requires compliance with the regulations incorporated by reference in the type certificate and because the certification basis of the

original product doesn't change, having an effectivity period for an application for a design change has not been necessary. Under the proposed § 21.101, which would require meeting the airworthiness standards in effect at the date of the application for the change, it is necessary to limit the effectivity of the application for a change, to support the intent of the proposed regulation. This proposed section would state that 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 in present § 21.17(c) and (d).

#### Section 21.101(e)

This proposed paragraph would contain procedures that would be applicable for changes of aircraft, aircraft engines, and propellers that have been type certificated using the airworthiness standards listed in Chapter 1. Proposed paragraph (e)(1) of § 21.101 would mandate that the certification basis for a change to a product certificated under the applicable regulations that preceded parts 23, 25, 27, 29, 31, 33, or 35 would be established in the same manner as a change to a product certificated under one of these parts. For example, an applicant would be required to show compliance with the latest amendment(s) under part 23 that would apply to a change to a small airplane originally certificated under Part 3 of the Civil Air Regulations (CAR 3). A change to an airplane type certificated under Special Federal Aviation Regulation No. 41 (SFAR 41), would be handled somewhat differently. The SFAR 41 requirements incorporated by reference in the type certificate of such an airplane have expired, and may no longer be used for purposes of issuing certificates; accordingly, under proposed § 21.101, only the latest amendments of the part 23 requirements of the SFAR 41 certification basis would be applicable for a change to an SFAR 41 airplane design.

Applicability of this proposed regulation would include changes to products type certificated under §§ 21.21 and 21.29. In addition, these

proposed procedures would be applicable for changes of aircraft that have been type certificated under §§ 21.24, 21.25, 21.27, and special classes of aircraft, where a part of the certification basis contains regulations from the airworthiness standards listed in Chapter 1.

At first glance, because some of the certification basis of aircraft type certificated under §§ 21.24, 21.25, 21.27, and special classes of aircraft do not completely consist of airworthiness standards of the Federal Aviation Regulations, aircraft type certificated under these regulations may not appear to completely benefit from the procedures of this proposed rulemaking. However, after careful consideration, the FAA has determined that the level of safety of changes to an aircraft that has been type certificated under any of these regulations, would benefit from the enhanced safety associated with the appropriate later amendments of those portions of the airworthiness standards that are a part of the certification basis. This takes into consideration that the certification basis, in some cases, may consist of airworthiness standards as well as other requirements found by the Administrator to be necessary to provide an equivalent level of safety.

For example, the certification basis for a special class aircraft or primary category aircraft may be based, in part, on portions of those airworthiness standards contained in Chapter 1 that were found by the Administrator to be appropriate for the specific type design. Since revisions are frequently made to the airworthiness standards to upgrade the minimum level of safety required for civilian aircraft and to incorporate certification standards for modern-state-of-the-art technology, it seems logical that the level of safety of changes to special class aircraft would benefit from compliance with the later airworthiness standards. These proposed procedures would apply only to those parts of the certification basis that were obtained from the airworthiness standards listed in Chapter 1.

Joint Aviation Requirements, JAR 22, is a published regulation being used as a means of compliance by the FAA for gliders, as a special class of aircraft, but this regulation is not listed in Chapter 1; therefore, the proposed procedures would not be applicable in this case. Although these procedures are not intended to be applicable to the Joint Aviation Requirements, an applicant may comply with these procedures when the Administrator finds them acceptable for a specific application.

Surplus military aircraft, type certificated in the restricted category under § 21.25(a)(2), normally are accepted on the basis of the previous military qualifications acceptance and service record in lieu of showing compliance with airworthiness standards in Chapter 1. However, a change to these aircraft for a special purpose operation usually is not supported by the military service history and needs to comply with an airworthiness standard. Compliance with the later amended airworthiness standard for the change would not be appropriate as the aircraft did not meet an airworthiness standard initially.

Limited category aircraft are surplus military aircraft, mostly from World War II, that were type certificated under Part 9 of the Civil Air Regulations for use other than air transport. These aircraft were not intended to carry persons or property for compensation or hire, and normally were accepted on the basis of their previous military qualifications acceptance and service record. However, a change to these aircraft usually is not supported by the military service history, therefore, the change must comply with appropriate airworthiness standards. It seems logical that the level of safety of changes to aircraft that have not been type certificated to an airworthiness standard would not benefit from compliance with the later airworthiness standards.

### **Section 21.115**

The type certificate holder may obtain approval for a change either by amending the type certificate under § 21.101 or by obtaining a

supplemental type certificate under § 21.115. Any other modifier would have to obtain a supplemental type certificate under § 21.115. 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.

Current § 21.115 incorporates the provisions of current § 21.101(a) and (b) by reference, making the provisions of the latter section equally applicable to applicants for supplemental type certificates. In view of the proposed changes to § 21.101, it is necessary to amend § 21.115 to refer simply to § 21.101 rather than specifically to § 21.101(a) and (b). This would not be a substantive change.

## **Section 25.2**

Current § 25.2(c) incorporates the provisions of current §§ 21.101(a)(2) and (b) by reference, addressing the subsequent revisions to the special retroactive regulations. To remain consistent with the proposed changes to § 21.101, it is necessary to amend § 25.2(c) to refer to § 21.101(a). This would not be a substantive change.

## **Paperwork Reduction Act**

In accordance with the Paperwork Reduction Act of 1980 (Pub. L. 96-511), there are no requirements for information collection associated with this proposed rule.

## **International Compatibility**

The proposal results, primarily, from a recommendation harmonized with the aviation authorities of Canada and Europe. Similar corresponding changes to regulations governing type certification procedures for changed products are being proposed by Transport Canada and the Joint Aviation Authorities.

## **Regulatory Evaluation, Regulatory Flexibility Determination, and Trade Impact Assessment**

Changes to federal regulations must undergo several economic analyses. First, Executive Order 12866 directs Federal agencies to promulgate new regulations or modify existing regulations only if the potential benefits to society outweigh the potential costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Finally, the Office of Management and Budget directs agencies to assess the effects of regulatory changes on international trade. In conducting these assessments, the FAA has determined that this proposed rule: 1) would generate benefits exceeding its costs and is not "significant" as defined in Executive Order 12866; 2) would not be "significant" as defined in DOT's Policies and Procedures; 3) would not have a significant impact on a substantial number of small entities; and 4) would not restrain international trade. These analyses, available in the docket, are summarized below.

### Regulatory Evaluation Summary

The following discussion of costs and benefits is provided because the proposed procedures would be explicitly incorporated into formal regulations. By administrative policy, the FAA is already urging designers to show that certain changed products comply with selected amendments that were adopted after the initial application for type certification of the base product. It is likely that such administrative decisions would continue, to some unknown degree for an unknown proportion of type certificated products, in the absence of the proposed rule.

The proposed rule would not initiate a specific certification standard or requirement per se, but instead, would formally alter the manner in which existing and future standards would be determined to be applicable. As a result, the FAA can describe, but is not able to quantify, the costs and benefits of the proposal. A quantification of the impacts would require a forecast of potential future changes to all commuter and transport category airplane models; all rotorcraft; and all other categories of regulated aircraft, aircraft engines, and propellers. In addition, a quantified evaluation would require a review of all applicable regulations that have been adopted during the intervening period after the type certification of the product, plus engineering appraisals of the intended changes for each product, the effects of those changes on other systems and components, and the economics associated with bringing each affected system and component up to the standards of the intervening regulations. No reasonably accurate estimate of these factors can be made.

In addition to the absence of a comprehensive estimate, no examples of such cost estimates are available for this evaluation. In some instances, the FAA has urged manufacturers of changed products to comply with later regulations. In association with these actions, individual manufacturers of proposed changed products have evaluated the costs and benefits that would be incurred to meet the pertinent standards. Due to competitive economic considerations, however, such information is considered proprietary and is not available.

The attributable costs of this proposal are the incremental costs that would be incurred to meet any additional or more stringent standards, adopted after the application for type certification of the initial product, that would not be required in the absence of this proposal. Similarly, the direct benefit of the proposal is the augmented safety that would result

from meeting such standards. Although the attributable costs and benefits cannot actually be quantified, the proposed rule is premised on an analysis to verify that any actions taken pursuant to it would be cost beneficial.

As noted in the description of the proposal, compliance with later regulations would not be required for a change that is not classified as being significant, for those areas or components not affected by the change, or where compliance with later regulations would not contribute materially to the level of safety or would be "impractical." Compliance with later amendments would be considered impractical if the applicant can show that such compliance would result in costs that are not consistent with the possible safety benefits. Further guidance on the definition of what constitutes a significant change would be provided in an advisory circular.

In addition to the benefits of any individual action taken pursuant to the proposed rule, the proposal would also generate procedural benefits. 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 addition, the proposed procedures have been harmonized with the foreign aviation authorities of Canada and Europe and the resulting common standards would reduce the costs and delays necessary to formally determine and fulfill dissimilar international requirements.

Although the attributable costs and benefits of the proposed rule cannot be quantified, the FAA holds that it would be cost beneficial.

### Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a Regulatory Flexibility Analysis if a proposed rule would have a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, establishes threshold cost values and small entity size standards for complying with RFA review requirements in FAA rulemaking actions. The proposed amendments would not have a significant economic impact on a substantial number of small entities.

### Trade Impact Assessment

The proposed rule would not constitute a barrier to international trade, including the export of American goods and services to foreign countries and the import of foreign goods and services into the United States. Instead, the proposed type certification procedures for changed products have been harmonized with those of foreign aviation authorities and would lessen the restraints on trade.

### **Federalism Implications**

The regulations proposed herein will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

### **Conclusion**

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Analysis, the FAA has determined that this proposed regulation is not a significant regulatory action under Executive Order 12866. In addition, the FAA certifies that this proposal, if adopted, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This proposal is considered nonsignificant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). An initial regulatory evaluation of the proposal, including a Regulatory Flexibility Determination and International Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

#### **List of Subjects**

14 CFR Part 11

Administrative practice and procedure reporting

14 CFR Part 21

Aircraft, Aviation safety, Safety, Type certification

14 CFR Part 25

Aircraft, Aviation safety, Safety, Type certification

### **THE PROPOSED AMENDMENTS**

Accordingly, the FAA proposes to amend 14 CFR parts 11, 21, and 25 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. The first sentence of § 11.11 is revised 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(c), 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) Except as provided in paragraph (b) of this section, an applicant for a change to a type certificate must show that the changed product complies with:

(1) Each regulation in parts 23, 25, 27, 29, 31, 33, and 35 of this chapter that is applicable to the changed product and that is in effect at the date of the application for the change; and

(2) Parts 34 and 36 of this chapter.

(b) The applicant may show that the changed product complies with an earlier amendment of a regulation required by paragraph (a)(1) of this section, and of any other regulation the Administrator finds is directly related, 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:

(1) For a change the effect of which, combined with all previous relevant changes, the Administrator finds is nonsignificant;

(2) For each area, system, component, equipment, or appliance that the Administrator finds is not affected by the change; and

(3) For each area, system, component, equipment, or appliance that is affected by the change, if the Administrator also finds that compliance with a regulation described in paragraph (a)(1) of this section would not contribute materially to the level of safety of the changed product or would be impractical.

(c) If the Administrator finds that the regulations in effect at 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 at the date of the application for the change.

(d) 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 it is clear that it will not be approved under the time limit established under this paragraph, the applicant may --

(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; or

(2) File for an extension of the original application and comply with the provisions of paragraph (a) of this section for an effective date of application, to be selected by the applicant, not earlier than the date that precedes the date of approval of the change by the time period established under this paragraph for the original application for the change.

(e) For purposes of this section, “each regulation that is applicable to the change” includes:

(1) Each regulation that is applicable to the change that would apply to the same change in a product type certificated prior to the codification of the applicable part(s) of this chapter, if that product were type certificated at the date of the application for the change; and

(2) Each regulation that the Administrator found to be appropriate to a product type certificated under §§ 21.24, 21.25, or 21.27, or an aircraft type certificated under § 21.17(b), where the type certificate incorporated regulations from parts 23, 25, 27, 29, 31, 33, or 35, based on the nature of the product design and the proposed change.

6. Paragraph (a) of § 21.115 is revised to read as follows:

**§ 21.115 Applicable requirements.**

(a) Each applicant for a supplemental type certificate must show that the altered product meets applicable 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.

\* \* \* \* \*

**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. Paragraph (c) of § 25.2 is revised to read as follows:

**§ 25.2 Special retroactive requirements.**

\* \* \* \* \*

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

Issued in Washington, DC, on April 22, 1997.

/S/ Ava L. Mims  
Acting Director  
Aircraft Certification Service