ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8110.48

4/25/03

SUBJ: **HOW TO ESTABLISH THE CERTIFICATION BASIS FOR CHANGED AERONAUTICAL PRODUCTS**

1. Purpose. This order revises the procedures for determining the certification basis for changes to type certificated products, reflecting amendments to Title 14 of the Code of Federal Regulations (14 CFR) §§ 21.19, 21.101, and 21.115. These procedures apply to design changes made through an amended Type Certificate (TC), a Supplemental Type Certificate (STC), or an amended STC. These procedures also apply to type validation programs. Under this order, Aircraft Certification Service personnel must apply these revised procedures to determine the certification basis for changed products.

TABLE OF CONTENTS

2. Distribution. This order is distributed to the Washington headquarters branch level in the Aircraft Certification Service; to the Washington headquarters division levels of Flight Standards

Distribution: A-W(IR)-3; A-W(FS)-2; A-X(CD)-2; A-FFS-10(ALL); AEU-100, A-FAC-O-(ALL); AFS-600 (3 copies)

Initiated By: AIR-110

Service; to all Chief Scientists and Technical Advisors (CSTAs); to all Aircraft Certification Directorates; to all Aircraft Certification Offices; to all Manufacturing Inspection Offices (MIO); to the International Airworthiness Programs Staff; to all Aircraft Evaluation Groups (AEG); to all Manufacturing Inspection District and Satellite Offices (MIDO and MISO); to the Brussels Aircraft Certification Division; and the Regulatory Support Division.

3. Division Related Publications.

a. Order 8110.4B, Type Certification.

b. Order 8100.5, Aircraft Certification Directorate Procedures.

c. Advisory Circular (AC) 21.101-1, Change 1, Establishing the Certification Basis of Changed Aeronautical Products.

4. Effective Date. This order explains how to implement type certification procedures for changed products per 14 CFR part 11 amendment 45, part 21 amendment 77, and part 25 amendment 99. For details on these amendments, refer to the June 7, 2000, final rule published in the *Federal Register* [65 FR 36244]. The changes to 14 CFR part 21 and the procedures in this order apply to all products starting June 10, 2003.

5. Background on Previous Certification Procedures.

a. Section 44701 of Title 49 of the U.S. Code (U.S.C.) requires the Administrator to promote safe flight of civil aircraft in air commerce by prescribing minimum standards in the interest of safety for the design, material, construction, quality of work, and performance of aircraft, aircraft engines, propellers, and appliances. Under 49 U.S.C. § 44704 the Administrator can issue TCs and STCs for aircraft, aircraft engines, and propellers.

b. The general certification procedures for products (aircraft, aircraft engines, and propellers) and parts are in 14 CFR part 21. Title 14 CFR §§ 21.16 through 21.29, 21.101, and 21.115 specify certain regulations and the applicable airworthiness standards for type certification of new and changed products. The term "changed product" – used throughout part 21 and this order – includes changes that are made through an amended TC, an STC, or amended STC.

c. Previous 14 CFR § 21.101(a) required that an applicant for a change to a TC comply with either the regulations cited in the TC or applicable regulations in effect on the date of application, plus any other amendments the Administrator found to be directly related. If an applicant chose to show compliance with the regulations in effect on the date of the application for the change, the applicant was also required to comply with any other directly related regulations. In some instances, a regulation may have been amended to become less stringent, while a related regulation had become more stringent. In these situations, an applicant was also required to comply with the related, more stringent regulation.

d. Since the previous 14 CFR § 21.101(a) did not require applicants to comply with the latest amendments to the regulations and did not grant the Administrator the authority to require

them to comply with the latest amendments to increase product safety, an applicant for a change to a type certificated product could show only that the altered product complied with the existing certification basis.

e. Previous 14 CFR § 21.101(b) dealt with changes for which the regulations did not provide adequate standards. Such changes generally consisted of a new design or a substantially complete redesign of a component, equipment, or system installation, and sometimes involved features that were not foreseen when the regulations were adopted. For these novel or unusual changes, the applicant was required to comply with regulations that provided a level of safety equal to that established in the original certification basis.

6. Revised Certification Procedures. The revised certification procedures promote the continuous introduction of new airworthiness standards for changed products.

a. Designation of applicable regulations (14 CFR §§ 21.101) applies to changes in the type design of aircraft, aircraft engines, and propellers, which do not require a new TC under 14 CFR § 21.19. This procedure enhances safety by applying the latest airworthiness standards, to the greatest extent practical, for certifying significant design changes.

b. For validation programs, the validating authority's date of application is the date the applicant applied to the certificating authority for the design change. Applicants should consult individual Bilateral Aviation Safety Agreement Implementation Procedures for Airworthiness (BASA IPA) when developing the validation basis for an amended TC, STC, or amended STC program.

c. Under 14 CFR § 21.101(a), a change to a type certificated product must comply with the latest requirements, unless it complies with the exceptions in 14 CFR §§ 21.101(b) and (c). The certification basis does not depend on whether the TC holder or an applicant for a STC is originating the change.

d. Title 14 CFR § 21.101(b) describes criteria for when an applicant can use earlier requirements. Applicants may use earlier requirements when the change is not significant. In cases where design changes involve features that have no adequate regulatory standard in the existing certification basis – but later appropriate regulations exist – the Administrator requires that applicants use appropriate later regulations for the proposed design change. For not significant design changes, the rule allows continued compliance with the existing certification basis, unless there is no adequate regulatory standard in the existing certification basis, without further approval by the Administrator.

e. Title 14 CFR §§ 21.101(b)1(i) and (ii) describes the automatic criteria for determining if the change is significant. Under 14 CFR §§ 21.101(b)(2) and (b)(3), applicants may use earlier requirements for significant changes to areas not affected by the change, or for cases where compliance to the latest requirements would not contribute materially to the level of safety or would be impractical. Earlier amendments may not precede the corresponding regulation listed in the existing certification basis or any requirement in 14 CFR §§ 23.2, 25.2, 27.2, or 29.2.

f. Title 14 CFR § 21.101(c) provides an exception to the requirements of 14 CFR § 21.101(a). An applicant for a change to an aircraft (other than rotorcraft) of 6,000

pounds or less maximum weight, or to a non-turbine rotorcraft of 3,000 pounds or less maximum weight, may show that the changed product complies with the regulations listed in the TC. The applicant may elect to comply with the later regulations. If the Administrator finds that the change is significant in an area of the product, the Administrator may require that the product comply with:

(1) A later amendment to the regulations listed in the type certificate data sheet (TCDS) that applies to the change, and

(2) Any regulation the Administrator finds is directly related.

> **NOTE:** See paragraph 9 of Advisory Circular 21.101-1 Change 1, for specific guidance on this provision.

g. Under 14 CFR § 21.101(d), special conditions apply when the regulations do not provide adequate standards for the proposed change because of a novel or unusual design feature. Title 14 CFR § 21.101(d) applies to significant and not significant design changes.

h. Title 14 CFR § 21.101(e) explains how long an application remains valid for a change to a TC, including STCs. An application for a change to a TC for a transport category aircraft is effective for five years, and an application for a change to any other category aircraft is effective for three years.

i. Title 14 CFR § 21.101(f) describes aircraft certificated under the requirements of 14 CFR §§ 21.17(b), 21.24, 21.25, and 21.27. The airworthiness requirements in effect on the date of application for these aircraft include airworthiness requirements that the Administrator finds to be appropriate.

7. Roles and Responsibilities. The following information identifies the roles and responsibilities for both the applicant and Aircraft Certification Service during certification projects:

a. Applicants:

(1) Identify and evaluate the proposed change. In assessing the change, define the affected areas and include previous relevant design changes along with the related, appropriate regulations. The evaluation should be comprehensive enough to fully understand the scope of the change.

(2) Identify if the change is significant or not significant at the product level using the information in AC 21.101-1 Change 1. The determination of significance must include a review of any previous relevant design changes.

(3) Apply the latest regulations for significant changes, unless a proposal is presented to apply earlier regulations. The applicant may propose to use one of the exceptions of 14 CFR § 21.101(b)2 or (b)3, that is, not affected area, does not contribute materially to the level of safety, and/or impracticality.

(4) Propose a certification basis with appropriate amendment levels.

b. Aircraft Certification Service:

(1) Guides the applicant on how to apply the rule. Each ACO and Directorate standards staff will have a Changed Product Rule focal point to advise on how to apply the rule. Also, the Certification Procedures Branch, AIR-110, has a focal point to support the Directorates regarding issues on the application of 14 CFR § 21.101, and provide leadership to the continuous improvement process.

(2) Uses the certification project notification (CPN) to notify the Directorate standards staff of the application and proposal, including the applicant's position on significance. The CPN will have an additional block to identify a significant change contrasted with a significant project. Appendix 2 references the new CPN form.

(3) Uses the delegation system to streamline implementation. Each ACO must work closely with its applicants to establish an effective delegation system.

(4) Determines if the change is significant for excepted aircraft per 14 CFR § 21.101(c). These products "default" as not significant design changes.

(5) Approves or disapproves the latest amendment exceptions as proposed by the applicant. When the applicant proposes exceptions, the FAA engineer must review data submitted and make a finding. Many times the Administrator will have predetermined if the change is not significant. The table in Appendix 1 of AC 21.101-1, Change 1 contains examples – predetermined by the Administrator – of substantial, significant, and not significant design changes.

(6) Uses the G-1 issue paper to record issues and resolution for changes to the certification basis. The G-1 issue paper would normally be used to document: significant changes where earlier regulations are applied per 21.101(b)(2)(3) (unaffected area, contribution to the level of safety, and impracticality); not significant changes, due to an inadequate certification basis, requiring the use of later regulations; and the application of special conditions per 21.101(d). All disagreements between the applicant and the Directorate regarding application of 14 CFR 21.101 will be resolved by AIR-110, the Certification Procedures Branch.

(7) Determines the certification basis. To establish the certification basis for validation programs, the ACO engineer should consult the procedures in the appropriate BASA IPA.

(8) Documents the certification basis in the amended TC or STC. See appendix 1, Samples of Documenting a Certification Basis for examples of documenting a design change.

8. Determining the Applicability of CFR § 21.101 for Changed Products.

a. A "change to a type certificate" as stated in 14 CFR § 21.101 refers to changes in type design. Minor changes (as classified by 14 CFR § 21.93 and approved under 14 CFR § 21.95) are by definition considered to be not significant. Therefore, they can be approved per the existing certification basis.

b. Substantial changes (14 CFR § 21.19) to a product that are so extensive that they require a complete investigation of compliance require a new TC. The process for determining substantial changes has not changed. The Administrator weighs the magnitude of the proposed design change against the degree of investigation needed to establish compliance with the application for the change. The following table outlines the certification process for substantial changes:

If the Administrator finds that the proposed design change …	Then the applicant must …	And …
Is substantial.	Submit an application for a new TC.	Establish the certification basis (14 CFR § 21.17), using the regulations in effect on the date of application for the change.
Is not substantial.	Comply with 14 CFR § 21.101.	Develop the certification basis, per guidance in this order and AC 21.101-1, Change 1.

c. Samples of a design change that require a new TC are no longer listed in 14 CFR § 21.19. These design changes are now evaluated case by case.

d. Title 14 CFR § 21.101 applies to all changes to type certificated products regardless of approval method: amended TC, STC, or amended STC.

e. The certification basis can vary depending on the magnitude and scope of the change. See the tables in Appendix 1 of AC 21.101-1, Change 1 for classifications of typical substantial, significant, and not significant design changes. Where the classification is not obvious for the proposed change, follow Paragraph 7 and Figure 1 of AC 21.101-1, Change 1 to determine the appropriate certification basis for the changed product.

f. A product level change is a change or combination of changes that makes the product distinct from the existing product (for example, range, payload, speed). Product level change is defined at the aircraft, aircraft engine, or propeller level and would result in an amended TC, STC, or amended STC. These changes typically, but not always, result in a model change that requires an amendment to the TC. However, a model change is not a prerequisite for a product level change. A system or component change can also rise to the product level.

(1) The product level change concept is directly related to the determination of significance, that is, the criteria used to determine significance. To assess if a change is significant, the applicant must consider the change and its effect on the overall aircraft, aircraft engine, or propeller at the product level.

g. A significant change is a change to the type certificate to the extent that it changes one or more of the following: general configuration, principles of construction, or the assumptions used for certification, but not to the extent to be considered a substantial change. The significance of the change must be considered in the context of all previous relevant design changes and all related revisions to the applicable regulations. Not all changes or product level changes are significant. Title 14 CFR § 21.101(b)(1) defines a significant change based on three automatic criteria:

(1) Significant changes to the general configuration are changes likely to require a new model designation to distinguish the product from other product models, for example, performance or interchangeability of major components.

(2) Significant changes to the principles of construction are changes to the materials and/or construction methods that affect the overall product's operating characteristics or inherent strength. They would require extensive reinvestigation to show compliance. An example is a primary structure change from metal to composites.

(3) Significant changes to the assumptions used for certification are changes to the product level assumptions associated with the compliance demonstration, performance, or operating envelope. These changes are so different that they invalidate the original assumptions. Examples may include:

(a) Changing an aircraft from an unpressurized to pressurized fuselage;

(b) Changing operation of a transport fixed wing airplane from land-based to water-based; and

(c) Operation envelope expansions that are outside the existing design parameters and capabilities. Merely expanding the envelope for which the product was originally designed is generally not a significant change because the assumptions – that is, the methodology or approach – used for certification of the basic product remain valid. The applicant can use the methodology/approach for the changed product with predictable effects.

h. Typically a change to a single area, system, or component will not result in a product level change. However there may be distinct cases where the change to a single system or component may, in fact, result in a significant change. For example, most avionics system installations adapt easily and do not change the product's general configuration or principles of construction. However, where a system installation affects the aircraft's operation, performance, or capability, it may, in turn, invalidate the original assumptions used for certification, and therefore result in a significant change under 14 CFR § 21.101(b)(1).

i. Previous relevant design changes can trigger one or more of the criteria in 14 CFR §§ 21.101(b)(1)(i) and (ii). When assessing a significant design change, either singularly or collectively, consider the cumulative effect of previous relevant design changes. Applicants may have included these previous design changes through earlier changes in the TC. The collective result may be a product considerably different from the latest updated certification basis for the product or model. Two examples of previous relevant aircraft design changes, which address those incremental increases, are weight or thrust. While individually not

significant (for example, 2 percent, 4 percent, or 5 percent discrete increases), these changes can – through a series of changes – become a significant change as incremental changes are made to the product.

j. If a proposed design change, together with any previous relevant design changes, triggers any of the three criteria in 14 CFR §§ 21.101(b)(1)(i) and (ii), the change is significant. Later regulatory amendments by themselves cannot drive the design change to be significant. See AC 21.101-1, Change 1, Paragraphs 6 and 7 for additional guidance on assessing significance.

k. The applicant must assess the effects of a significant change on other systems, components, equipment, or appliances of the product because areas that have not been changed may be affected. However, the applicant need not resubstantiate those areas of the product where the change or the updated certification basis will not invalidate the original substantiation. If the significant change does not affect an area, then the applicant need not revisit the certification basis of that area.

l. Secondary changes are changes to the affected areas that are part of, and consequential to, the design change. They do not add new capabilities or capacity to the product, and are always required by the significant change to complete the installation. Examples of secondary changes include: extending hydraulic line for landing gear, adding circuit breakers for a comprehensive flight deck upgrade, extending ventilation ducting, lengthening control cables or wiring to accommodate a fuselage plug. Secondary changes are considered not significant and may continue to comply with the existing certification basis.

m. The Administrator evaluates a design change on an engine or propeller independently of the aircraft. However, applicants must assess engine or propeller design changes when installed at the aircraft level. They also should establish a separate classification for the product. A significant change at the engine or propeller level may not be significant at the aircraft level or vice versa, and may require dual certification (one for the engine or propeller, and the other for the aircraft).

n. The airworthiness requirements in effect on the date of application are in 14 CFR parts 21, 23, 25, 27, 29, 31, 33, and 35. Predecessor regulations – Civil Air Regulations (CARs) – are not recognized under 14 CFR § 21.101(a), but may be allowed under 14 CFR §§ 21.101(b), (c) and (f).

9. Certification Basis for Significant Changes.

a. If the Administrator classifies the change as significant, the applicant must comply with the amendments in effect on the date of application for the change. The applicant may use the exceptions in 14 CFR §§ 21.101(b)(2) and (3) to show compliance with earlier amendments or with the existing certification basis. For areas not affected by the change, and areas affected by the change for which compliance with the latest requirements would not contribute materially to the level of safety or would be impractical, the applicant must provide acceptable justification to support the application of the earlier amendments. The final certification basis may combine the latest, earlier, and existing regulations, but not regulations that precede the existing certification

basis. Paragraph 8 and Appendices 2 and 3 of the AC 21.101-1, Change 1 describe exceptions to 14 CFR §§ 21.101(b)(2) and (3).

b. Pursuing a change for a specific product may not be economically viable for all applicants. Some applicants cannot afford changes that are deemed practical. Because compliance with the latest regulations may be affordable for a large manufacturer but not a smaller one, the change may appear *practical* for the larger manufacturer, but *impractical* for the smaller one. To avoid creating business inequities, both would be required to comply with the same amendment level of a particular regulation.

10. Certification Basis for Changes That Are Not Significant. When the change is determined to be not significant, the rule allows continued compliance with the existing certification basis except in the following cases:

a. If the change consists of a new or substantially complete redesign of a component or system and the existing certification basis does not provide adequate standards for the design change – that is, the change includes features that were not foreseen in the existing certification basis. The change must comply with later appropriate regulations. Examples are:

(1) Replacing a conventional aluminum constructed flap with an all-composite flap. This change would be considered not significant because it does not change the general configuration, principals of construction, or assumptions used for certification at the product level. If the existing certification basis does not contain appropriate regulations, the applicant would apply later regulations addressing the composite requirements. Starting with the existing certification basis, the Administrator will progress through each later regulation to determine the amendment appropriate for the change.

> **NOTE:** However, if the applicant changed the primary structure, for example, the wing, from aluminum to composites, this would be a change in the product level principles of construction, and the product level change would be significant. The appropriate latest regulations for composite materials would apply.

(2) Adding an advanced avionics system on an aircraft that did not have lightning protection. Compliance with the regulations for lightning protection would be appropriate for this not significant change.

b. Applicants may volunteer to comply with later amendments in the existing certification basis, but should consult the Administrator to ensure they also are complying with any other, directly related regulations. Applicants are not allowed to pick and choose without a full understanding of interrelated regulations.

11. Special Conditions (Novel or Unusual Design Features).

a. If the Administrator finds that the regulations in effect on the date of application for the change do not provide adequate standards because of novel or unusual design features, special conditions apply. Special conditions can apply to both significant and not significant changes.

b. The intent of applying special conditions remains the same as before, in that it addresses novel and unusual design features that were not considered by the existing certification basis and are not covered in later regulations. The appropriate level of safety for the special conditions should be commensurate with the agreed upon certification basis for the change.

12. Certification Basis for Excepted Aircraft (14 CFR § 21.101(c)).

a. Title 14 CFR § 21.101(c) provides an exception to 14 CFR § 21.101(a) compliance with the latest requirements for aircraft (other than rotorcraft) of 6,000 lbs. or less maximum weight, or to a non-turbine rotorcraft of 3,000 lbs. or less maximum weight. In these cases, the applicant may elect to comply with the existing certification basis. However, the applicant has the option of applying later appropriate regulations. Special classes of aircraft – including gliders, airships, and primary category – are addressed in 14 CFR § 21.101(f), and not in 14 CFR § 21.101(c).

b. If the Administrator finds that the change is significant in an area, the Administrator may require the applicant to comply with a later regulation and any regulation the Administrator finds is directly related. Starting with the existing certification basis, the Administrator will progress through each later regulation to determine the amendment appropriate for the change. However, if an applicant proposes, and the Administrator finds, that complying with the later amendment or regulation would not contribute materially to the level of safety of the changed product or would be impractical, the Administrator may allow the applicant to comply with an earlier amendment appropriate for the proposed design change. The amendment may not be earlier than the existing certification basis.

(1) For a significant change, the Administrator must designate which regulations and their amendments will be required. As part of this process, the Administrator will determine each area, system, component, equipment, or appliance that the change affects. Applicants may propose to comply with an earlier amendment if they can justify that the earlier amendment would not contribute materially to the level of safety or would be impractical.

(2) For a not significant change, the applicant may comply with the existing certification basis or may volunteer, subject to the Administrator's approval, to comply with later regulations or later amendments to the existing certification basis. The Administrator must ensure that the applicant complies with any other regulations directly related or relevant. In some instances, a regulation may be amended to become less stringent, while a related regulation may become more stringent. In these situations, the applicant must comply with the related, more stringent regulations.

(3) For a not significant change that lacks an adequate certification basis:

(a) If the change contains new features (which were not foreseen in the existing certification basis and for which appropriate later regulations exist), the Administrator will designate the applicable airworthiness requirements, starting with the existing certification basis and progressing to the most appropriate later amendment level for the change.

(b) If the change contains a novel or unusual design feature, the Administrator will designate the applicable special conditions appropriate for the change, per 14 CFR § 21.101(d).

(4) The exception for products under 14 CFR § 21.101(c) applies to the aircraft only. Design changes to engines and propellers installed on these excepted aircraft are assessed as separate type certificated products using 14 CFR §§ 21.101(a) and (b).

13. Certification Basis for 14 CFR § 21.101(f) Aircraft.

a. For aircraft type certificated under 14 CFR §§ 21.17(b), 21.24, 21.25, and 21.27, the certification bases are the applicable regulations – and their amendments in effect on the date of application – that the Administrator finds appropriate for the change. When selecting a certification basis for a change, an applicant may elect to show compliance to an earlier amendment under 14 CFR § 21.101(b). The exceptions in 14 CFR § 21.101(c) do not apply to categories of products in 14 CFR § 21.101(f). See appendix 3 for an overview of how the Changed Product Rule is applied to develop the certification basis for these other aircraft.

b. Special Classes Aircraft. For special classes of aircraft certificated under 14 CFR § 21.17(b), including the engines and propellers installed on them, the applicable requirements for the changed product will be portions of airworthiness requirements in 14 CFR parts 23, 25, 27, 29, 31, 33, and 35 that the Administrator found to be appropriate for the aircraft and applicable to the specific type design. The Administrator may designate other airworthiness criteria that are appropriate for the change based on the aircraft's intended use and the standards for establishing the original certification basis.

c. Primary Category Aircraft. For primary category aircraft certificated under 14 CFR § 21.24, the applicable airworthiness requirements are in 14 CFR parts 23, 27, 31, 33, and 35, or other requirements that the Administrator finds appropriate for the change. These requirements must apply to the specific design and the aircraft's intended use. They also provide a level of safety acceptable to the Administrator.

d. Restricted Category Aircraft. For a change to an aircraft certificated in the restricted category under 14 CFR § 21.25(a)(1), complying with the latest regulations would not normally contribute materially to the level of safety or be practical for its intended use. However, if the regulations incorporated in the type certificate do not provide an appropriate level of safety for the aircraft's intended use, the changed product must comply with a later appropriate regulation.

(1) If the change includes design features that were not foreseen when the existing certification basis was established, and there are later regulations or amendments that address these features, the change must comply with the appropriate later regulations. In this case, start with the requirements in the existing certification basis – and examine subsequent amendments – to arrive at a requirement that provides a level of safety appropriate for the product's intended use. If the change contains "novel" or "unusual" (14 CFR § 21.101(d)) design features for which there are no applicable later regulations, special conditions are required.

(2) An example of a change that included design features that were not foreseen when the aircraft was originally certified is a change that replaces reciprocating engines with turbopropeller engines. In this case, the original certification basis did not contain regulations for turbine engine installations. We must use later amendments to provide an appropriate level of safety for the aircraft's intended use.

e. Restricted Category Aircraft – Military Aircraft. The Administrator accepts aircraft type certificated in the restricted category under 14 CFR § 21.25(a)(2) based on their U.S. military service history. Because the Administrator did not certificate many of these aircraft to a specific set of airworthiness standards, the table in 14 CFR § 21.27 for surplus military aircraft is used to set an appropriate equivalent civilian certification basis. Title 14 CFR § 21.101(f) requires that the Administrator apply the latest amendments to significant changes to these products, but the latest amendments may not be appropriate for the aircraft's intended use. Earlier regulations that do not predate the equivalent certification basis are acceptable. If these regulations do not include design standards that apply to the change, later regulations appropriate to the product category will be applied. The goal is to maintain a level of safety appropriate for the aircraft's intended use.

f. Limited Category Aircraft. Limited category aircraft are surplus military aircraft, mostly from World War II, that were type certificated under part 9 of the CAR for use other than air transport. These aircraft were not intended to carry persons or property for hire, and normally were accepted based on their previous military qualifications and service record. A change to aircraft not supported by the military service history must comply with appropriate airworthiness standards. The level of safety associated with earlier standards may be acceptable for limited category aircraft.

g. Surplus Military Aircraft. Aircraft type certificated under 14 CFR § 21.27 are entitled to a TC in the normal, utility, acrobatic, commuter, or transport category. These aircraft were designed and constructed in the United States, accepted for operational use, and declared surplus by the U.S. Armed Forces. These aircraft may be counterparts, and are considered equivalent, to the previously civil certificated aircraft. Product changes or modifications to these aircraft are certificated in the same manner as their civil counterparts.

14. Delegation Authority. Title 14 CFR 21.101(b) (1) allows an applicant to comply with earlier regulations for a design change that the Administrator determines to be "not significant." An applicant may classify a change as "not significant" using the criteria and examples in AC 21.101-1, Change 1.

a. The applicant can propose the classification and the Administrator can make a determination of "not significant" based on the applicant's classification. This will normally be done as part of the CPN process before the project proceeds. Or, a representative of the Administrator may make a determination of "not significant," on the Administrator's behalf, without further finding.

b. To make a determination of "not significant" on the Administrator's behalf without further finding, there must be a written agreement between the cognizant Aircraft Certification Office (ACO) and the applicant that defines the system the applicant will use to apply the criteria in AC 21.101-1, Change 1. The written agreement must include a description of the delegation system the applicant will use to make the determination. The agreement may be a stand-alone document or may be part of an existing agreement, such as a Partnership for Safety Plan, Organizational Procedures Manual, the applicant's quality manual, or an existing memorandum of agreement.

c. The applicant may have an existing design control system that satisfies this requirement. An acceptable system will include procedures to classify changes as "not significant" and will address changes that were not foreseen in the existing certification basis.

d. The agreement between the ACO and the applicant must describe the design control system to ensure the applicant is consistently applying the criteria. The Administrator's oversight is achieved by monitoring the applicant's project notification and design control system.

15. Documenting Changes to a Product's Certification Basis.

a. All changes that revise the product's certification basis must be documented on the TC or STC. The certification basis for changes to TCs and STCs requires that the applicant documents the regulations, as well as the regulations' amendment levels. Appendix 1 identifies samples of how to document a certification basis.

b. Complete the TC or STC before issuing the design approval. Send a copy of the TC to the accountable directorate and AIR-140 after the design change approval is issued. The certification basis must be readily available to applicants modifying type certificated products. The certification basis on amended TCs, STCs, and amended STCs must be available to other companies or individuals upon request from the ACO that issued or amended the document.

16. Records Management. Refer to Orders 0000.1, FAA Standard Subject Classification System, 1350.14, Records Management, and 1350.15, Records Organization, Transfer, and Destructions Standards, or your office Records Management Officer (RMO)/Directives Management Officer (DMO) for guidance regarding retention or disposition of records.

Original signed by

Susan J.M. Cabler
Acting Manager, Aircraft Engineering Division
Aircraft Certification Service

APPENDIX 1. SAMPLES OF DOCUMENTING A CERTIFICATION BASIS

This appendix gives two samples of documenting a TCDS or STC certification basis, appendix 1, figure 1. The first describes a Boeing 737-300 passenger to freighter configuration (including full cargo floor, main deck cargo door, interior and associated systems). The appendix 1, figure 2, shows the type design of the Windjet 100 series airplance which is a generic continuation sheet for a Windjet 100 to a 100AC model change conversion.

For product level changes described in this order, the examples are significant per 14 CFR §§ 21.115 and 21.101, and Advisory Circular 21.101-1, Change 1. The resultant certification basis combines the latest, intermediate, and existing regulations. The intermediate and existing regulations were derived through the application of 14 CFR 21.101(b), contribution to the level of safety, and impracticality.

The product can partially comply with a particular amendment level of a part (see appendix 1, figure 2). In these cases, document partial compliance paragraph by paragraph.

APPENDIX 1. SAMPLES OF DOCUMENTING A CERTIFICATION BASIS
FIGURE 1. SAMPLE DOCUMENTING A CERTIFICATION BASIS

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number ST00001DC

This Certificate issued to US Cargo Conversion Company
5201 Tranquility Lane
Colorful, Colorado 80110

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part 25 of the Federal Aviation Regulations.*

Original Product Type Certificate Number: A16WE

Make: Boeing

Model: 737-300

Description of Type Design Change: Conversion of a Boeing 737-300 passenger configuration to freighter configuration (including full cargo floor, main deck cargo door, interior and associated systems) in accordance with PCCC Master Drawing List PC-001, Revision B, dated March 23, 2001, or later FAA-approved revisions.

Limitations and Conditions: The installation should not be incorporated in any aircraft unless it is determined that the interrelationship between this installation and any previously approved configuration will not introduce any adverse effect upon the airworthiness of the aircraft.

(Limitations and Conditions continued on page 3 of 4)

This certificate and the supporting data which are the bases for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: March 20, 2001

Date of issuance: April 24, 2001

Date reissued:

Date amended:

By direction of the Administrator

(*Signature*)
Manager, Certification Procedures Branch
Aircraft Engineering Division

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

 This certificate may be transferred in accordance with FAR 21.47.

APPENDIX 1. SAMPLES OF DOCUMENTING A CERTIFICATION BASIS
FIGURE 1. SAMPLE DOCUMENTING A CERTIFICATION BASIS (CONTINUED)

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)
Number ST00001DC

Certification Basis:

Based on 14 CFR §§ 21.115 and 21.101, and the FAA policy for significant changes in FAA Order 8110.48, the certification basis for the Boeing Model 737-300 series passenger to Freighter is as follows:

a. The type certification basis for Boeing Model 737 series airplanes is shown on TCDS A16WE for parts **not changed or not affected** by the change.

b. The certification basis for parts **changed or affected** by the change since the reference date of application, March 20, 2001, is based upon part 25 as amended by Amendment 25-101. Based on 14 CFR §§ 21.115 and 21.101, and the FAA policy for significant changes in FAA Order 8110.48, the certification basis for this modification was determined to be:

Regulations at the latest amendment 25-0 through 25-101
25.1 - 25.31, 25.301 - 25.307, 25.561 - 25.563, 25.581, 25.601 - 25.625, 25.671 - 25.689, 25.729, 25.777, 25.783 - 25.793, 25.801 – 25.812, 25.843, 25.851 - 25.869, 25.871, 25.903, 25.1301, 25.1309, 25.1322 – 25.1326, 25.1351 – 25.1363, 25.1411 – 25.1423, 5.1431 – 25.1461, 25.1501, 25.1519 – 25.1533, 25.1541 – 25.1563, 25.1581 – 25.1585, Appendix F

Regulations at an intermediate amendment

25.574	Amendment 25-54
25.629	Amendment 25-46
Appendix H	Amendment 25-54

Regulations at the amendment level in TCDS A16WE
25.25, 25.321 - 25.373, 25.471 - 25.519, 25.731 – 25.735, Appendix G

- If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

----------END----------

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

FAA Form 8110-2(10-68) Page 3 of 3 *This certificate may be transferred in accordance with FAR 21.47.*

APPENDIX 1. SAMPLES OF DOCUMENTING A CERTIFICATION BASIS
FIGURE 2. SAMPLE DOCUMENTING A CERTIFICATION BASIS

The type design of the Windjet 100 series airplanes was approved by issuing Type Certificate A11DC. The Windjet 100 series airplanes were certified to amendment 22 of 14 CFR part 25. In June 2000, the TC was amended to include the Windjet 100AC. The Windjet 100AC is a retrofit of a Windjet 100 airplane with an Advanced Cockpit (AC). The following is based on information from the Windjet 100 Type Certificate Data Sheet (TCDS):

1. For all Model Windjet 100AC airplanes, issuance of a TC is based on compliance with the following:

a. Conversion of a Windjet 100 to a Windjet 100AC can be accomplished by Windjet Aircraft Drawing SP10000.

b. The Certification Basis is defined as:

(1) Title 14 CFR part 25, dated February 1, 1965, with Amendments 1 through 22 "Airworthiness Standards: Transport Category Airplanes," and 14 CFR § 25.471 of Amendment 25-23, for all areas not affected by the change.

(2) Title 14 CFR part 25, dated February 1, 1965, including Amendments 25-1 through 25-89 for the change and all areas affected by the change. The following lists the Federal Aviation Regulations complied with through Amendment Level 25-89.

25. 125	25. 605	25. 685	25. 841	25. 1039	25. 1326	25. 1435	25. 1541
25. 145	25. 607	25. 689	25. 843	25. 1141	25. 1327	25. 1439	25. 1543
25. 149	25. 609	25. 693	25. 855	25. 1142	25. 1329	25. 1441	25. 1545
25. 207	25. 611	25. 699	25. 857	25. 1145	25. 1331	25. 1443	25. 1549
25. 301	25. 613	25. 703	25. 858	25. 1161	25. 1333	25. 1445	25. 1551
25. 303	25. 615	25. 729	25. 863	25. 1165	25. 1335	25. 1447	25. 1553
25. 305	25. 619	25. 733	25. 901	25. 1207	25. 1337	25. 1449	25. 1555
25. 307	25. 621	25. 771	25. 903	25. 1301	25. 1351	25. 1451	25. 1563
25. 397	25. 623	25. 773	25. 943	25. 1303	25. 1353	25. 1453	25. 1581
25. 399	25. 625	25. 777	25. 952	25. 1305	25. 1355	25. 1457	25. 1583
25. 405	25. 629	25. 779	25. 954	25. 1307	25. 1357	25. 1459	25. 1585

APPENDIX 1. SAMPLES OF DOCUMENTING A CERTIFICATION BASIS
FIGURE 2. SAMPLE DOCUMENTING A CERTIFICATION BASIS (CONTINUED)

(3) The following lists the exceptions to compliance with Amendment 25-89 to the Federal Aviation Regulations:

SECTION NO.	TITLE	AT AMENDMENT 25-
25.365	Pressurized Compartment Loads	54*
25.562	Emergency Landing Dynamic Conditions	64**
25.571	Damage-Tolerance and Fatigue Evaluation	0,89***
25.631	Bird Strike Damage	0,89***
25.807(c)(3)	Emergency Exits	15
25.813	Emergency Exit Access	45,89***
25.1141(f)	Power Plant Controls: General	11****
25.1309	Equipment, Systems and Installations	0,89***
25.1419(c)	Ice Protection	23,89***

* Exception only for interior partition at body station 120.

** Exception for front row Head and Femur Injury Criteria (§25.562(c)(5)(6)) only.

*** Applicable to new or modified structures and systems, and portions of the airplane affected by the change. Where two amendment levels are shown for the same paragraph, the number without the asterisk (*) applies to structures, systems and portions of the airplane that are not affected by the change. The structure, systems, and components which comply with the later amendments are identified and approved in Windjet Drawing SP10000.

**** Exception applies to Auxiliary Power Unit spar mounted fuel shutoff valve only. All other power plant controls were shown to comply with § 25.1141 at amendment 25-89.

Amendment level "0" is the original published version of part 25 (February 1, 1965).

APPENDIX 2. SAMPLE CERTIFICATION PROGRAM NOTIFICATION

Subject: ACTION: Certification Program Notification **Date:**

From: Manager, (ACO)

To: Manager, XXX-110

Part A: (To be completed by office receiving application)

1. Project No.: _____
2. Model Designation: _____
3. Applicant: _____
4. Address: _____
5. Date of application: _____
6. Type of project: TC___ ATC___ STC___ ASTC___
7. Expected completion date: _____
8. Project Manager: _____ Telephone Number_____
9. Project Engineer: _____
10. Description: _____
11. We do ___ / do not ____ consider this a significant project per Order 8110-4b.
12. We do ___ / do not ____ consider this a significant change per 14 CFR § 21.101(b)(1)
13. CSTA Involvement? Yes_____ No _____ Not Determined_____
14. AEG Involvement? Yes_____ No_____ Not Determined_____

_____

Manager, (project, or ACO, etc.)

Part B: (To be completed by Directorate)

Date:

From: Manager, XXX-110

To: Manager, (ACO)

We do ___ / do NOT ____ consider this program to be significant and have assigned _____as our Project Officer.

Please do ___ / do NOT ____ submit a draft Certification Program Plan.

Signature authority ( ) is / ( ) is NOT delegated to your office.

Directorate ACOS Project No.:

APPENDIX 3. ESTABLISHING THE CERTIFICATION BASIS FOR SIGNIFICANT CHANGES TO OTHER CATEGORY AIRCRAFT [14 CFR § 21.101(f)]

Category	If the certification basis is …	Then, the starting point for modifications to existing aircraft is …	And the applicant should …
21.17 (b) Special Class	Portions of 14 CFR Parts 23, 25, 27, 29, 31, 33, or 35	Latest amendment of applicable 14 CFR sections	Consider intended use (passengers, flight instruction)
	Other than FARs, for example, JAR 22, JAR VLA	Existing certification basis	Use later or latest "other" standard based on intended use
21.24 Primary	Portions of 14 CFR Parts 23, 27, 31, 33, or 35	Latest amendment of applicable 14 CFR sections	Consider intended use (passengers, flight instruction)
	Other than FARs, for example, JAR	Existing certification basis	Use later or latest "other" standard based on intended use
21.25a(1) Restricted	Portions of 14 CFR Parts 23, 25, 27, 29, 31, 33, or 35; CAR 3, CAM 8	Latest amendment of applicable 14 CFR sections	Consider intended use based on special purpose
21.25a(2) Restricted or Limited (CAR 9)	Based on military qualification acceptance and service history	14 CFR § 21.27(f) table	Consider intended use based on special purpose
21.27 Surplus Military	Portions of 14 CFR Parts 23, 25, 27, 29, 31, 33, or 35 and predecessor regulations	Latest amendment of applicable 14 CFR sections	Consider intended use, including standard airworthiness certificates