Federal Aviation Administration – Regulations and Policies
Aviation Rulemaking Advisory Committee

Aircraft Certification Procedures Issue Area
Parts Working Group

Task 1 – Parts Manufacturer Approvals

Task Assignment

Aviation Rulemaking Advisory Committee ; Parts Working Group

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of establishment of the Parts Working Group.

SUMMARY: Notice is given of the establishment of the Parts Working Group of the Aviation Rulemaking Advisory Committee (ARAC). This notice informs the public of the activities of the ARAC on aircraft certification procedures issues.

FOR FURTHER INFORMATION CONTACT: Mr. William J. (Joe) Sullivan, Assistant Executive Director, Aviation Rulemaking Advisory Committee, Aircraft Certification Service (AIR-3), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267-9554; FAX: (202) 267-5364.

SUPPLEMENTARY INFORMATION: The Federal Aviation Administration (FAA) has established the Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190, January 22, 1991; and 58 FR 9230; February 19, 1993). One area of the ARAC deals with is aircraft certification procedures (57 FR 39267; August 28, 1992). These issues involve the procedures for aircraft certification found in parts 21, 39, and 183 of the Federal Aviation Regulations (FAR), and Special Federal Aviation Regulation No. 36 (SFAR 36), which are the responsibility of the FAA Director of Aircraft Certification. By this notice, these issues are expanded to include advice on requirements relating to parts found in FAR parts 43, 45, and 145.

Section 601 of the Federal Aviation Act of 1958 provides, among other things, statutory authority for the Administrator to set minimum standards governing the design, materials, workmanship, construction, and performance of aircraft, aircraft engines, and propellers (referred to below as "products"), and for parts for these products. Under this authority, the FAA regulates the manufacture, maintenance, and modification of these products, as well as the design and production of parts used in the manufacture, maintenance, and modification of those products.

Replacement and modification parts are approved in several ways. Parts used during the original manufacture of the product are approved under the type and production certificates, or a technical standard order approval for that product. Thus, a part purchased from the holder of a production certificate or technical standard order approval is approved by virtue of those certificates. An owner-operator may produce parts for maintaining or altering his or her own product. Standard parts such as nuts and bolts which conform to an established industry or U.S. specification are considered to be approved parts. Any replacement or modification part which does not fall into any of the above categories must be produced under the procedures for a Parts Manufacturer Approval (PMA).

The holder of a PMA is authorized to produce replacement and modification parts for sale for installation on aviation products. Regulations in subpart K of FAR part 21, FAR part 43, and FAR part 45, prescribe requirements for obtaining, and the responsibilities of holding a PMA. The regulations governing PMA have remained essentially unchanged since their inception. However, the original intent and scope of the PMA rules no longer respond to industry needs. Today, parts produced under PMA account for a significant portion of all aviation parts sold. There also have been fundamental changes in the aviation industry in the production and distribution of replacement parts. The Parts Working Group is being formed to review and recommend changes to the rules governing PMA, and replacement and modification parts.

Specifically, the Parts Working Group's task is the following:

Task: The Parts Working Group is charged with making recommendations to the ARAC concerning the need for new or revised rules governing Parts Manufacturer Approvals, and for replacement or modification parts in Subpart K of FAR Part 21, FAR part 43, and FAR part 45 (specifically section 45.15) and Part 145. The Parts Working Group will submit recommendations to the ARAC, which will determine whether to forward them to the FAA.

Reports: A. Recommend time line(s) for completion of the task, including rationale, for consideration at the ARAC meeting to consider aircraft certification procedures issues held following publication of this notice.

B. Give a detailed conceptual presentation on the proposed recommendations to the ARAC before proceeding with the work stated in Item C, below.

C. Develop a Notice of Proposed Rulemaking (NPRM) proposing the new or revised rules for PMA holders and for replacement and modification parts, a supporting economic and other required analysis, advisory and guidance material, and any other collateral documents the Working Group determines to be needed. Present these recommendations to the ARAC for further consideration and disposition.

D. Given a status report on the task at each meeting of the ARAC held to consider aircraft certification procedures issues.

The Parts 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 be a representative of one of the member organizations of the ARAC. 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 "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 Chairs of the ARAC Issue Group and the Parts Working Group; and the individual will be advised whether or not the request can be accommodated.

The Secretary of Transportation has determined that the information and use of the ARAC is necessary in the public interest in connection with the performance of duties imposed on the FAA by law. Meetings of the ARAC will be open to the public, except as authorized by section 10(d) of the Federal Advisory Committee Act. Meetings of the Parts 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 March 19, 1993.

William J. Sullivan,

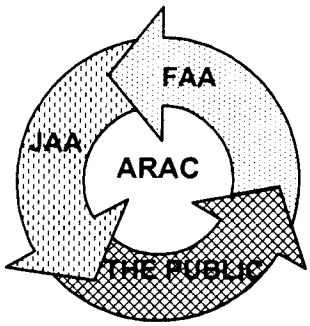
Assistant Executive Director for Aircraft Certification Procedures Issues, Aviation Rulemaking Advisory Committee.

[FR Doc. 93-7088 Filed 3-26-93; 8:45 am]

BILLING CODE 4910-13-M

Recommendation Letter

AVIATION RULEMAKING ADVISORY COMMITTEE



February 23, 1999

Mr. Thomas E. McSweeny
Associate Administrator for
Regulations and Certification AVR-1
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Subject: Aviation Rulemaking Advisory Committee Tasking on Production Certification and Parts, Reference Federal Register Notices 58FR16572 and 58FR16574.

Dear Mr. McSweeny:

The ARAC 21 Issues Group met on January 21, 1999 to disposition the joint recommendations of the Production Certification and Parts Working Groups that were developed in response to FAA taskings under the leadership of Don Van Burkleo, Cessna and Peter Gallimore, Boeing. The Issues Group favorably supported and approved the transmittal to your office of the enclosed draft NPRM.

During the meeting, the Experimental Aircraft Association wished to register a continued concern for the manufacturing of parts for older aircraft where data is not available and "identicality" or "form, fit and function" is used to construct such parts. Draft NPRM pages 81 thru 84 presently speak to this subject and it is very necessary that this language be retained in the final rule preamble for posterity as there is no specific coverage of this situation in the proposed rule.

Also, during the meeting, two minority opinions were raised. Meeting attendees recommended that the draft NPRM not be revised at that time to desposition these matters, but rather to transmit them to your office for consideration as appropriate. I am, therefore, please to submit the recommendations herewith, together with copies of the minority opinion.

ARAC 21 looks forward to the FAA's earliest possible issuance of an appropriate public notification and final rule processing of these recommendations. The globalization of the aviation industry and, in particular, the increased use of foreign suppliers dictates that revision of production certification regulations is needed as soon as possible. The requirements for parts manufacturing were greatly enhanced by the release of FAA Order 8110.42, PMA Procedures. The requirements of this order now need to be formalized by the implementation of the recommended draft NPRM.

It should be noted that the FAA General Counsel and Economist final reports had not been received at the time of the January 21, 1999 Issues Group meeting. APO and AGC have each generated previous reviews and have maintained regular contact with the working groups.

Their final report will be forthcoming and they have agreed that this draft NPRM should be formally submitted to the FAA for your processing in advance of their final reports.

Thank you for the opportunity to serve you.

Sincerely yours,

Bill Schultz
Assistant ARAC Chair
ARAC Aircraft Certification Procedures Issues

Enclosures: Draft ODA NPRM, Aircraft Electronics Association Fax Dated January 21, 1999, and Airline Suppliers Association Memorandum Dated January 20, 1999.

Cc: Don Van Burkleo
Peter Gallimore

Acknowledgement Letter

U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

AUG 4 1999

Mr. Bill Schultz
Assistant Chair, Aircraft Certification
Procedures Issues
1400 K Street NW.
Washington, DC 20005

Dear Mr. Schultz:

Thank you for your February 23 letter forwarding the working documents developed by the Production Certification and Parts Working Groups under the Aviation Rulemaking Advisory Committee (ARAC).

As indicated in your letter, the recommendation lacks formal economist and legal reviews. In addition, the Federal Aviation Administration (FAA) must consider and resolve concerns raised by members of ARAC. While we are unable to project an expected completion date, every effort will be made to establish a priority and allocate resources to complete this effort in consideration of other agency priorities.

I would like to thank the aviation community for its commitment to ARAC and, in particular, the Production Certification and Parts Working Groups for their expenditure of resources to develop the working documents. The groups are commended for their extensive deliberations on this difficult task.

Sincerely,

Thomas E. McSweeny
Associate Administrator for
Regulation and Certification

Recommendation

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 1, 21, 45

[Docket No. FAA-98- ; Notice No. 98-]

RIN 2120 -

Production Certification and Parts Manufacturing

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of Proposed Rulemaking (NPRM).

INTRODUCTION:

The Current Manufacturing Environment

The U.S. manufacturing environment has changed in several respects that are not reflected in current regulations. When those regulations were established, a relatively small number of companies manufactured either the complete aircraft, or aircraft engines and propellers, or just propellers under a type certificate and production certificate. Those manufacturers typically licensed and oversaw the manufacturing of replacement parts for their products. The environment has greatly changed, particularly in the production of replacement parts. The U.S. aircraft fleet is aging. Many companies that originally manufactured the complete aircraft, aircraft engine, or propeller and that oversaw replacement part manufacturing have gone out of business. Thus, the manufacture of replacement parts is a major

business and competition is increasing. In addition, aircraft production and parts production are increasingly global. Often manufacturing is under the control of a consortium of U.S. and foreign manufacturers.

The current regulations are for the most part based on the "old" way of doing business when a few major U.S. TC/PC holders, PMA holders, STC holders, and TSOA holders constituted the industry. With airline deregulation and globalization, major changes have and are still taking place in the aviation community. These changes have significantly increased competition among airlines who have in turn passed their competitive pressures on to their suppliers. The airlines' demand for lower costs has resulted in a surge of PMA and STC activity as additional manufacturers have competitively entered the replacement parts market. This activity has already provided individual airlines with millions of dollars in annual savings on the purchase of new replacement parts. An increase in product liability costs and other factors have resulted in more aircraft models that are out of production, are not supported by the original TC/PC holder, and are depending on the PMA process for replacement parts.

In addition, the perception of the airworthiness of replacement parts by elements of the aviation industry is that products or parts produced under an FAA production certificate are more reliable than parts produced under some other FAA form of approval. To the extent that this perception is based on

administrative differences, standardizing the system so that all parts manufacturers would have separate design and production approvals could help to eliminate any perceived inequality among either design or production approvals.

The above reasons, in addition to others, have prompted the review of part 21. The proposed changes are intended to provide a greater credibility to the PMA and STC process, assure a continuation of the excellent safety of flight record of replacement parts and articles, and simplify production and airworthiness certification procedures. The proposed changes to part 21 are needed to assure a safe growth of the aviation industry.

FAA and Industry Cooperation to Resolve the Problems

The FAA established the Aviation Rulemaking Advisory Committee (ARAC) in January 1991 to provide an ongoing mechanism to involve the aviation industry in the regulatory process (56 FR 2190; January 22, 1991; and 58 FR 9230; February 19, 1993). In March 1993, the FAA established the Parts Working Group as part of ARAC (58 FR 16572, March 29, 1993).

The Parts Working Group was tasked with making recommendations to the ARAC concerning the need for new or revised rules governing Parts Manufacturing Approvals, and for replacement or modification parts in subpart K of 14 CFR parts 21 and 45.

At the same time, the FAA also established the Production Certification Working Group.

The Production Certification Working Group was tasked "with making recommendations to ARAC concerning the modernization of requirements applicable to production approval holders in subparts F, G, H, J, K and O of part 21."

The stated objective of potential recommendations was "to establish a more modern, standardized set of production approval requirements more responsive to current industry production practices." On November 22, 1994, the charter was amended to add subpart L of part 21 and subparts A and B of part 45 to the list of subparts for the Production Certification Working Group to review. In 1995, the FAA issued Order No. 8110.42, Parts Manufacturers Approval Procedures. This order has been used as a basis for the ARAC review and recommendations.

Specifically excluded from the FAA task assigned to the Production Certification Working Group were changes to the design requirements for Type Certificate (TC), Supplemental Type Certificate (STC) and Technical Standard Order (TSO). This exclusion was respected by the Production Certification Working Group. Only the design requirements for a Parts Design Approval (previously Parts Manufacturing Approval, PMA) have been changed in accordance with the task assigned to the Parts Working Group. These changes are in accord with FAA AC 8110.42.

Following the release of FAA policy on enforcement (reference FAA Policy Memo, February 27, 1995) the Parts Working

Group was requested by the FAA to define a Standard Part and a Commercial Part and later still, following Federal Register release (reference Proposed Interpretation of "Standard Parts", 61 FR 47671; September 10, 1996), a definition of an Electrical/Electronic Standard Part.

In 1998 the Production Certification Working Group was asked to work with the FAA, JAA, and Transport Canada to harmonize the use of the Form 8130-3 Airworthiness Approval Tag with the JAA Form 1 and Transport Canada Form 24-0078.

In order to provide for a clear delineation of the Parts Working Group responsibilities relative to those of the Production Certification Working Group, the working group chairs, together with the Issues Group Vice Chair, agreed on the following:

The following differentiates the responsibilities of the Production Certification Working Group and the Parts Working Group relating to Parts Manufacturer Approvals (PMA). Both groups, of course, will additionally have the responsibility of fulfilling all their charter requirements.

The Production Certification Working Group will address the FAR Part 21 quality system requirements governing Parts Manufacturer Approvals (PMA). This will be accomplished to the extent that the result will be a single set of quality assurance requirements for all current Production Approval Holders (PAH); i.e., Production Certificate, Approval Production Inspection

System, Technical Standard Order Authorizations and Parts Manufacturer Approvals.

The Parts Working Group will address the technical (engineering) requirements for parts manufacturing approval which currently fall into the category of PMA parts. It will also address replacement and modification technical approval requirements and all the associated regulatory requirements in 14 CFR parts 21 and 45.

The recommendations to modernize part 21 of the Federal Aviation regulations are a combined effort of the Production Certification and Parts Working Groups and recommended to the FAA by the ARAC. They are needed to standardize the design and production approval processes, to recognize the global nature of aircraft and parts manufacturing, and to help eliminate the potential for installing unapproved parts on FAA type certificated aircraft. This proposal is the result of a cooperative effort of the aviation industry and the FAA through the Aviation Rulemaking Advisory Committee.

DATES: Comments must be received on or before (Insert date 120 days after date of publication in the Federal Register).

ADDRESSES: Comments on this proposed rulemaking should be mailed or delivered, in duplicate, to: U.S. Department of Transportation Dockets, Docket No. FAA-98- (insert), 400 Seventh

Street, SW., Room Plaza 401, Washington D.C. 20590. Comments may also be sent electronically to the following Internet address: 9-NPRM-CMTS@faa.dot.gov. Comments may be filed and/or examined in Room Plaza 401 between 10 a.m. and 5 p.m. weekdays except Federal holidays.

FOR FURTHER INFORMATION CONTACT: (INSERT CONTACT NAME, OFFICE, PHONE NUMBER), Federal Aviation Administration, 800 Independence Avenue, SW., Washington D.C. 20591; telephone (202) 267-

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in this rulemaking by submitting written data, views, or arguments, and by commenting on the possible environmental, economic, and federalism-or energy-related impact of the adoption of this proposal. Comments concerning the proposed implementation and effective date of the rule are also specifically requested.

Comments should carry the regulatory docket or notice number and should be submitted in duplicate to the Rules Docket address specified above. All comments received and a report summarizing any substantive public contact with FAA personnel on this rulemaking will be filed in the docket. The docket is available for public inspection both before and after the closing date for receiving comments.

Before taking any final action on this proposal, the Administrator will consider the comments made on or before the closing date for comments, and the proposal may be changed in light of the comments received.

The FAA will acknowledge receipt of a comment if the commenter includes a self-addressed, stamped postcard with the comment. The postcard should be marked "Comments to Docket No. FAA-98-XXXXX." When the comment is received by the FAA, the postcard will be dated, time stamped, and returned to the commenter.

Availability of the NPRM

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) or the Federal Register's electronic bulletin board service (telephone: (202) 512-1661).

Internet users may reach the FAA's web page at http://www.faa.gov or the Federal Register's webpage at http://www.access.gpo.gov/su_docs for access to recently published rulemaking documents.

Any person may obtain a copy of this NPRM by mail by submitting a request to the Federal Aviation Administration, Office of Rulemaking, 800 Independence Avenue, SW., Washington D.C. 20591 or by calling (202) 267-9677. Communications must identify the notice number of this NPRM.

Persons interested in being placed on the mailing list for future NPRM's should request from the FAA's Office of Rulemaking a copy of Advisory Circular No. 11-2A, Notice of Proposed -- Rulemaking Distribution System, that describes the application procedure.

OVERVIEW

The following provides an overview of the major proposed revisions, deletions and additions to the current regulations. Each of these items is followed by the summary and then a detailed Section by Section Discussion.

1). **STANDARD QUALITY SYSTEM:** The quality system requirements which currently are inconsistent and scattered throughout part 21 for various production approvals, would be standardized for all production approval holders and presented in just one area of the production approval regulations.

2). **SUBPART L:** This subpart, which currently contains detailed instruction for export airworthiness approvals, has been simplified into proposed regulations which cover documentation of all airworthiness approvals. Detailed export airworthiness approval instructions would be relocated to FAA directives and advisory material. This would include the ability of a production approval holder to split lots of parts at its distribution facility, and the ability of a production certificate holder to partially disassemble a product for

shipment after the airworthiness document was issued. The proposal would recognize the current industry practice of using the airworthiness approval form (FAA Form 8130-3) as a common identifiable birth certificate of aviation parts and products (other than aircraft) and a common identifiable return-to-service document for aviation parts and products (other than aircraft), as well as the export airworthiness approval tag specified in the current regulation. The proposed regulation is consistent with the "paper trail" recommendations of the FAA/Industry Suspected Unapproved Parts (SUPs) Steering Group, and is in harmony with European and Canadian practices.

3). **PARTS MANUFACTURING:**

DESIGN: Reinforcement of the design data requirements of the current regulations for all products and parts would be accomplished by incorporating language from FAA Order No. 8110.42 which more clearly addresses "Design Data."

Parts Manufacturer Approval (PMA) as a combined FAA design and production approval would be replaced by separate design and production approvals. The current PMA design approval aspects would be replaced with a requirement for an applicant to obtain a parts design approval (PDA). The current PMA production approval aspects would be replaced with a requirement for an applicant to obtain a parts production approval (PPA). The methodology for obtaining design approval has been modified by introducing the more comprehensive approach of "Test reports and computations,

using a comparative or general analysis." This proposal is discussed in more detail under subpart K.

4). **PART MARKING**: Parts manufactured under a production approval would be required to be individually marked. Also, parts marking would be simplified partly by eliminating the requirement to include "Installation Eligibility" and "FAA-PMA." In today's environment many parts are eligible for multiple installations. Considerable confusion exists among parts installers when a part is marked with the installation eligibility of a specific model when it has also been determined by the FAA to be eligible on a number of variants of the same model.

5). **TSO AUTHORIZATION:** Technical Standard Order authorization as a combined FAA design and production approval would be replaced by separate design and production approvals. The current TSOA design approval aspects remain unchanged. The current TSOA production approval aspects would be moved to subpart G and would be replaced with a requirement for an applicant to obtain a parts production approval.

6). **STANDARD PART:** The definition of a "Standard Part" would be specifically identified in the regulation and it would include standard parts manufactured to specifications prepared by a design approval holder. This would be in addition to the currently understood definition which limits standard parts to those manufactured to specifications prepared by a consensus standards organization such as SAE, NIST, etc.

Current definition wording "U.S. Government..." will change to "government" so that standards manufactured to specifications prepared by foreign governments are included.

In accordance with an FAA release in the Federal Register (62 FR 9923; March 5, 1997), certain discrete (non programmable) electrical and electronic parts which meet a performance standard will be classified as standard parts and exempt from the requirements of FAA production approval.

7). **COMMERCIAL PART:** The regulations would establish a new definition for "Commercial Parts" to recognize a class of parts which are neither referred to in the current FAA regulations nor in any advisory material. The industry has used the terminology "Commercial Part" for many years to describe such parts as light bulbs, batteries, fire axes, smoke detectors etc., since the supply of these parts is predominantly procured by other commercial operations such as the automobile, tractor, home/office building industries etc.

8). **ENFORCEMENT:** The proposed rule would strengthen the prohibition against falsification of applications, reports, or records to increase the FAA's enforcement ability.

Part 21 Summary

Differences Between Current and Proposed Part 21

ITEM	PROPOSAL
~~Part 1, Definitions~~	~~**Change:** Standard part definition has been moved from §21.303 and expanded to include parts manufactured to specifications prepared by a design holder. It also includes standard parts manufactured to specifications prepared by foreign consensus standards setting organizations and certain discrete (non-programmable) electrical and electronic parts such as diodes, resistors, etc., which may be conformed solely on the basis of performance criteria.~~ ~~**Reason:** Many specifications for parts which are in the AN, Military Specification category are prepared by design approval holders and foreign consensus standards setting organizations.~~ ~~For electrical and electronic non-programmable parts the FAA made a determination (62 FR 9923; March 5, 1997) that if conformity could be established on the basis of performance criteria, these would be classified as standard parts.~~ ~~NOTE: Certain parts such as some mechanical fasteners, bearings and seals which would have been considered standard parts had the specification not been proprietary, are handled within the TSO concept and do not require rulemaking.~~ ~~**Change:** Commercial part has been specifically defined for the first time.~~ ~~**Reason:** There are many parts such as light bulbs, batteries, and fire axes which are included in the type design, which will never become PMA'd and which currently lack any form of regulatory recognition. Today they are all considered suspected unapproved parts (SUPS).~~

Part 1, Definitions	Change: Standard part definition has been moved from §21.303 and expanded to include parts manufactured to specifications prepared by a design holder. It also includes standard parts manufactured to specifications prepared by foreign consensus standards setting organizations and certain discrete (non-programmable) electrical and electronic parts such as diodes, resistors, etc., which may be conformed solely on the basis of performance criteria. Reason: Many specifications for parts which are in the AN, Military Specification category are prepared by design approval holders and foreign consensus standards setting organizations. For electrical and electronic non-programmable parts the FAA made a determination (62 FR 9923; March 5, 1997) that if conformity could be established on the basis of performance criteria, these would be classified as standard parts. NOTE: Certain parts such as some mechanical fasteners, bearings and seals which would have been considered standard parts had the specification not been proprietary, are handled within the TSO concept and do not require rulemaking. Change: Commercial part has been specifically defined for the first time. Reason: There are many parts such as light bulbs, batteries, and fire axes which are included in the type design, which will never become PMA'd and which currently lack any form of regulatory recognition. Today many are considered suspected unapproved parts (SUPS).

Part 21 Summary
Differences Between Current and Proposed Part 21

Part 21 Subpart A	
§ 21.1 Applicability	**Change:** The terms for Parts Design Approvals and Production Approvals are introduced. **Reason:** The separation of the design approval from the manufacturing approval of the previous process under PMA and TSOA requires new terminology. The Production Approval refers to all approvals to manufacture aeronautical parts and products. These include the Parts Production Approval and the traditional Production Certificate. **Change:** The general term Design Approval is introduced. **Reason:** The use of this term like Production Approval above applies to all design approvals including PDA and the more traditional TC and STC.
§ 21.2 Falsifications	**Change:** Added "omission of a material fact" as an act of fraud in the submission of an application to the Administrator. **Reason:** Enhance the enforceability of fraud in making applications for certificate.
§§ 21.3, 21.5	**Change:** Unchanged.
~~§ 21.7 Compliance~~	~~**Change:** Discretion added for the Administrator to deny and application for a certificate under this part.~~ ~~**Reason:** This brings the Production Approval discretionary action on a par with that held by the Administrator under §119.39~~

§ 21.7 Compliance	**Change: Discretion added for the Administrator to deny an application for a certificate under this part.** **Reason: This brings the Production Approval discretionary action on a part with that held by the Administrator under §119.39**
Subparts B,C,D and E	**Change:** The requirements for achieving design approval for a Type Certificate

Part 21 Summary (Continued)

Differences Between Current and Proposed Part 21

	(TC), Supplemental Type Certificate (STC) and Technical Standard Order (TSO) remain unchanged. **Reason:** Beyond the tasking scope of the working group.
Subpart F	**Change:** Eliminated. **Reason:** The essence of this deleted subpart has been incorporated in Subpart G and the Single Quality System.
Subpart G § 21.131 Applicability	**Change:** Expanded to include all existing and future production approvals. Incorporates a statement for the manufacture of replacement parts from the current §21.303. This latter statement also clarifies the several sources of approved parts beyond those produced by Production Approval Holders. **Reason:** This is the foundation for the implementation of a single quality system for all Production Approval Holders.

~~§ 21.133 Eligibility~~	~~**Change:** An applicant must hold an approved design or have the right to the use of such a design. Other requirements such as an approved quality system and facilities within the U.S. are consistent with existing rules and policies.~~ ~~**Reason:** This expands the availability of a Production Approval beyond the holders of Type Certificates.~~
§ 21.133 Eligibility	**Change: An applicant must hold an approved design or have the right to the use of such a design. Other requirements, such as an approved quality system, are consistent with existing rules and policies.** **Reason: This expands the availability of a Production Approval beyond the holders of Type Certificates.**
~~§ 21.135 Issuance~~	~~**Change:** The Administrator may impose restrictions on the use of elements of the manufacturer's quality system or permit the expansion of the system for manufacture and conforming development parts for design approval purposes.~~ ~~**Reason:** The restrictions will most commonly occur when the manufacturer and the design approval holder are separate~~
§ 21.135 Issuance	**Change: The Administrator may authorize a PAH to proceed with the manufacture of products or parts prior to meeting all requirements for a production approval. In such cases, the Administrator may restrict functions of certain portions of the quality system, or may require additional inspections and tests.** **Reason: The restrictions will allow the**

Part 21 Summary (Continued)
Differences Between Current and Proposed Part 21

	~~entities and there can only be a coordinated material review board and the manufacturer must coordinate with the design approval holder in the instance of §21.3 reporting requirements. The ability to use the approved quality system for inspecting and documenting development material used for design approval, will be an element that must be in the approved quality system.~~
	FAA to impose additional requirements such as those currently included in Subpart F, if required. The ability to use the approved quality system for inspecting and documenting development material used for design approval, as well as production material produced prior to production certification, will be an element that must be in the approved quality system.
~~§ 21.137 Production System Limitation~~	~~Change: The Administrator may issue a Production Approval with restrictions based on the approved quality system. The PLR will also reflect the complete design approval list for the production approval.~~ ~~Reason: The first item is for the ability to manufacture development parts for design approval or to restrict the manufacturer's ability to exercise a material review board. The second condition reflects the new operating philosophy of the PDA.~~
§ 21.137 Production System Limitation	**Change: The Administrator may issue a Production Approval with restrictions based on the approved quality system. The PLR will also reflect the complete design approval list for the production approval.** **Reason: The first item is for the ability of the FAA to document any restrictions imposed on a PAH's quality system, as well as any special inspection or test requirements. The second condition reflects the new operating philosophy of the PDA, and is consistent with the current use of a PLR with relation to a Production Certificate.**

~~§ 21.139 Privileges~~	~~**Change:** The PAH may, with an approved Quality System, manufacture a limited quantity of parts for design approval purposes. The PAH may also issue Airworthiness Certificates without further showing.~~ ~~**Reason:** Provides a capability consistent with current practice wherein parts for new products are produced under the manufacturing controls of PAH's. The issuance of Airworthiness Certificates will bring the U.S. manufacturers up to the same capability and response time as the European and Canadian manufacturers who already issue such certificates.~~
§ 21.139 Privileges	**Change: The PAH may, with an approved Quality System, manufacture a limited quantity of parts for design approval purposes. The PAH may also issue Airworthiness Approvals without further showing.** **Reason: Provides a capability consistent with current practice wherein parts for new products are produced under the manufacturing controls of PAH's. The issuance of Airworthiness Approvals will bring the U.S. manufacturers up to the same capability and response time as the European and Canadian manufacturers who already issue such approvals.**
~~§ 21.141 Responsibility~~	~~**Change:** The PAH must report any potential § 21.3 reporting situation to the Design Approval Holder, if they are separate entities (e.g. Licensees). In the event of the cancellation of a license, subsequent MRB, escapes and reporting~~
§ 21.141 Responsibility	**Change: The PAH must report any potential § 21.3 reporting situation to the Design Approval Holder, if they are separate entities (e.g. Licensees). In the event of the cancellation of a license,**

Part 21 Summary (Continued)
Differences Between Current and Proposed Part 21

	~~required by § 21.3, must be coordinated with the Administrator.~~ ~~**Reason:** This is brought about with the licensing of the use of approved design data, which has become common practice.~~ ~~**Change:** A new requirement is to issue an Airworthiness Certificate with each shipment of parts or products, except aircraft.~~ ~~**Reason:** This change is in support of the Suspected Unapproved Parts Team request to provide an initial parts release document with new parts.~~ ~~**Change:** The PAH must maintain quality records for 2 years for all parts produced and for 10 years for all critical parts produced.~~ ~~**Reason:** The requirement is to bring consistency with that imposed on PMA Holders.~~

	subsequent MRB, escapes and reporting required by § 21.3, must be coordinated with the Administrator. **Reason:** **This is brought about with the licensing of the use of approved design data, which has become common practice.** **Change:** **A new requirement is to issue an Airworthiness Approval with each shipment of parts or products, except aircraft.** **Reason:** **This change is in support of the Suspected Unapproved Parts Team request to provide an initial parts release document with new parts.** **Change:** **The PAH must maintain quality records for 2 years for all parts produced and for 10 years for all critical parts produced.** **Reason:** **The requirement is to bring consistency with that imposed on PMA Holders.**
§ 21.145 Quality System	**Change:** Establish a singular definition of a Quality System, which incorporates the several (4) systems formerly throughout Part 21. The single system reflects the global trend toward ISO 9000 **(Specific Name)** while it is not a slavish incorporation of that Standard. The single system modernizes the requirements defined by the Administrator. Some of the specifics not previously enumerated include a gage calibration system (21.158) and an internal audit (21.164). The remaining elements of the Quality System reflect similar requirements as were in the previous rule. **Reason:** The consolidation of the quality requirements throughout Part 21 into one section will present a single profile for part manufacture/quality airworthiness.

~~Subparts K and O Design Approval/ Production Approval~~	**~~Change:~~** ~~The current FAA letter informing an applicant that approval is granted for both design and production of TSO article(s) or modification and replacement part(s) (currently a Parts Manufacturer Approval; PMA) has been changed. Design approval and production approvals have been separated in the proposal. For a TSO article, the FAA will issue a Parts Design Approval (PDA) for design and a Production Parts Approval (PPA), with an accompanying Production Limitation Record (PLR) for production approval. For modification and replacement part(s), the FAA will issue a Parts Design Approval (PDA) for design and a separate Production Parts Approval (PPA) with accompanying PLR for production approval. The Type Certificate for products design approval and Production Certificate (PC) with accompanying PLR remain unchanged.~~ **~~Reason:~~** ~~This is an attempt at applying the same requirements to all production approval holders (PAH). Each PAH will meet the requirements for achieving design approvals and all will receive a separate production approval; i.e., PC or PPA and PLR. All production approval holders must meet the proposed common quality system requirements whether they produce aircraft, engines, propellers, TSO articles or modification and replacement parts. Each must first receive design approval and subsequently receive production approval separately based on compliance with the proposed common quality system with a listing of each item authorized to produce on the PLR.~~

Subparts K and O Design Approval/ Production Approval	**Change: The current FAA letter informing an applicant that approval is granted for both design and production of TSO article(s) or modification and replacement part(s) (currently a Parts Manufacturer Approval; PMA) has been changed. Design approval and production approvals have been separated in the proposal. For a TSO article, the FAA will issue a Parts Design Approval (PDA) for design and a Parts Production Approval (PPA), with an accompanying Production Limitation Record (PLR) for production approval. For modification and replacement part(s), the FAA will issue a Parts Design Approval (PDA) for design and a separate Parts Production Approval (PPA) with accompanying PLR for production approval. The Type Certificate for products design approval and Production Certificate (PC) with accompanying PLR remain unchanged.** **Reason: This is an attempt at applying the same requirements to all production approval holders (PAH). Each PAH will meet the requirements for achieving design approvals and all will receive a separate production approval; i.e., PC or PPA and PLR. All production approval holders must meet the proposed common quality system requirements whether they produce aircraft, engines, propellers, TSO articles or modification and replacement parts. Each must first receive design approval and subsequently receive production approval separately based on compliance with the proposed common quality system with a listing of each item authorized to produce on the PLR.**
Subpart K Parts Manufacturing Approval (PMA)	**Change:** Subpart K "Approval of Material, Parts, Processes, and Appliances," is now titled "Parts Design Approval," and only deals with the design approval requirements for replacement or modification parts.

Part 21 Summary (Continued)

Differences Between Current and Proposed Part 21

	~~**Reason:** Production and quality requirements have been moved to Subpart G which provides a common system.~~ ~~**Change:** Approval by identicality of design has been removed from the regulation.~~ ~~**Reason:** This methodology has not always been applicable or appropriate. It isn't adequate for all design aspects or applications where criticality is a significant consideration. This methodology remains viable when appropriate as discussed in the preamble and orders.~~ ~~**Change:** An application for PDA must address any variance in the IFCA applicable to the original design.~~ ~~**Reason:** This has always been a practice and is currently specified in orders, this proposal would make the requirement a regulation.~~ ~~**Change:** The proposed Parts Design Approval is transferable and the PMA is not.~~ ~~**Reason:** The separation of design and production approval allows the design approval to be transferable.~~ ~~**Change:** Design approvals under PMA issued before the effective date of the final rule will meet the design approval requirements for a PDA.~~ ~~**Reason:** This will in effect convert all existing PMA design approvals to PDA's and thereby extend all PDA privileges and responsibilities to them.~~

	Reason: Production and quality requirements have been moved to Subpart G which provides a common system. **Change:** Approval by identicality of design has been removed from the regulation. **Reason:** This methodology has not always been applicable or appropriate. It isn't adequate for all design aspects or applications where criticality is a significant consideration. This methodology remains viable when appropriate as discussed in the preamble and orders. **Change:** An application for PDA must address any variance in the Instructions for Continued Airworthiness applicable to the original design. **Reason:** This has always been a practice and is currently specified in orders, this proposal would make the requirement a regulation. **Change:** The proposed Parts Design Approval is transferable and the PMA is not. **Reason:** The separation of design and production approval allows the design approval to be transferable. **Change:** Design approvals under PMA issued before the effective date of the final rule will meet the design approval requirements for a PDA. **Reason:** This will in effect convert all existing PMA design approvals to PDA's and thereby extend all PDA privileges and responsibilities to them. **Change:** The requirements for changing a PDA have been added to Subpart K.

	Reason: These requirements have never been specifically addressed in the regulations for replacement or modification parts.
Subpart L	**Change:** Title of Subpart L changed from Export Airworthiness Approvals to Airworthiness Approvals. **Reason:** Based on harmonization with other airworthiness authorities, and efforts to combat Suspect Unapproved Parts (SUPs), the FAA has already allowed extended use of the export airworthiness approval form (FAA Form 8130-3) for domestic use and return-to-service, through policy change. The title change reflects the extended use of the form. **Change:** Detailed export airworthiness approval requirements removed from the regulation. **Reason:** These detailed requirements will be placed in Directives and Advisory Circulars. This will allow more flexibility for change. **Change:** Form numbers have been removed from the regulation. **Reason:** These detailed requirements will be placed in Directives and Advisory Circulars. This will allow more flexibility for change. **Change:** Class I, II and III product definitions have been eliminated. **Reason:** There is no distinction between Class II and III parts in the proposed regulation. An FAA airworthiness approval must be issued for all new part shipments (reference proposed § 21.141(h)).

Subpart L (continued)	**Change:** References to FAA Designees required to issue the airworthiness approvals for parts and products other than aircraft have been eliminated. **Reason:** This reflects a fundamental change in the way airworthiness approvals for parts and products other than aircraft are issued. For new parts and products, original airworthiness approvals will be issued by the production approval holder. For repaired and overhaul parts and products, these forms will be issued by the certificated entity returning the part or product to service. **Change:** Export Certificates are only required for aircraft, not propellers or engines. **Reason:** This is consistent with domestic airworthiness approvals, where only aircraft receive an airworthiness certificate, and all other products receive an airworthiness approval. **Change:** Airworthiness approvals may be issued for parts or products other than aircraft prior to type certification if there is an acceptable recall system if the parts or products are not approved as part of the subsequent type certificate approval. **Reason:** This will allow airworthiness certificates to be issued for parts which are pre-positioned prior to type certification, as allowed under current Advisory Circular 21-32A, and proposed § 21.139(c).

Item	Proposal
Part 45 Part Marking	**Change:** Applicability has been added for: (a). Owner/Operator produced parts (b). Identification of critical components **Reason:** To recognize expanded requirements for parts marking. **Change:** Detail parts whose markings become obliterated during normal manufacturing assembly need not be remarked. **Reason:** To clarify that individual piece parts must be marked when handled as replacement parts, but when used in a top assembly and a marking is obliterated it need not be remarked. **Change:** 45.14 has been modified to note that non-life limited structural components are not subject to the identification of critical components. **Reason:** Embedded structural components not normally considered replaceable would have presented a problem. **Change:** Eliminate requirement for eligibility marking. **Reason:** Many parts have multiple installation eligibilities. Eligibility information is available in other required documents. **Change:** Address TSO, subcomponents and replacement part marking. **Reason:** To cover part marking in single Part 45 location.

SECTION BY SECTION DISCUSSION

In the following discussion, each proposed substantive change, addition, or deletion in the rule language is explained. Rule language taken from the present rules, but not substantively changed, is not explained in detail.

~~[**NOTE:** DEFINITIONS ARE WRITTEN ON THE ASSUMPTION THAT THE DEFINITIONS OF STANDARD PART, COMMERCIAL PART AND ELECTRICAL/ELECTRONIC STANDARD PART ARE ALL APPROVED BY THE FAA AND THE PARTS WORKING GROUP IN TIME FOR THE FINAL RELEASE OF THE PART 21 NPRM TO THE FAA. IT IS PROPOSED TO PLACE THEM IN PART 1.]~~

Section 1.1 Definitions

New definitions for "standard part" and "commercial part" are proposed to be added to the list of definitions in part 1.

Standard Part: Although "standard part" is not currently defined in the regulations, § 21.303 (b) (4) refers to "standard parts (such as bolts and nuts) conforming to established industry or U.S. specifications" and "standard part" is defined in Order 8110.42. The current FAA interpretation as stated in this order is as follows:

"Standard Part is an item manufactured in complete compliance with an established U.S. government or industry accepted specification which includes design, manufacturing and uniform identification requirements. The specification must include all information necessary to produce and conform the part. The specification must be published so that any party may

manufacture the part. Examples include, but are not limited to, National Aerospace Standards (NAS), Air Force-Navy Aeronautical Standard (AS), Military Standard (MS)."

The definition proposed for § 1.1 also would include as a standard part, parts manufactured to specifications prepared by the holder of a design approval. Including some specifications prepared by a design approval holder in the category of a standard part recognizes the current situation wherein many thousands of part numbers manufactured to specifications prepared by a design approval holder have been accepted by the FAA as standard parts for many years, although the current regulations do not specifically recognize such parts as standard. The proposed definition also recognizes that as more MIL-Specs are canceled, design approval holders may need the flexibility of developing their own specifications for standard parts in order to respond rapidly to their on-going production requirements. The proposed definition replaces "U.S. Government" with "a government agency" so that parts of foreign manufacture which meet all of the standard parts criteria would also be acceptable.

The expansion of the ability to use specifications published by government agencies other than the U.S. Government reflects the global reality of the industry. Component that are designed and manufactured by suppliers outside the U.S., use "standard part" manufactured to specifications established within their

country. The issue with a standard part specification is not the design criteria itself because that is resolved as acceptable when the Type Design or TSODA is approved. The issue is their relevant Government Agencies publishes the specification and it contains Design, Manufacture, Test, Acceptance Criteria and Marking requirements such that anyone may perform conformity inspection. The specification must also be subject to revision controls. The responsibility of conformity of standard of standard parts, irrespective of the ownership of the specification, always resides with the user of the part. This responsibility is the basis for the requirement that the specification for a Standard Part must be in the public domain. The Production Certification and Parts Working Groups proposed that an Advisory Circular be maintained which lists the accepted standard parts specification published by government agencies, consensus standard setting organization and industry. Consensus standard setting organizations are those associations such as American Society of Mechanical Engineers (ASME), IEEE, ANSI, etc. Industry Specifications are those specifications that meet the content and revision requirements and are placed in the public domain by a holder of a Type Certificate, Supplemental Type Certificate or a ~~TSODA.~~**Parts Design Approval**.

During the course of developing a definition of "standard part" various minority opinions arose all of which were satisfied

or withdrawn so that the definition is supported by 100 percent of the Production Certification and Parts Working Groups.

At one stage in the definition development process, the definition contained the words "or designated by a type certificate holder." There were two objections to this wording - one from the holder of a design approval other than a type certificate and one from FAA General Counsel.

In resolving these objections the working group agreed that if one design approval holder had the right to designate specifications as standards, all design approval holders should have the same right.

The second objection, raised by FAA General Counsel, offered an opinion that the FAA had not granted the delegated right for design approval holders to <u>designate</u> parts as "standard." This resulted in the development of criteria by which the FAA might support a delegated right for design approval holders to "designate" parts as standard parts, with the FAA making the final determination.

In addition to the expansion of the standard part definition to include specifications prepared by design approval holders, the definition would include certain discrete (meaning non-programmable) electrical and electronic parts such as transistors, diodes, resistors, and non-programmable integrated circuits, e.g., amplifiers, bridges, switches, relays, gates,

etc. which are manufactured to specifications which are essentially standard specifications, established by standards organizations such as the Society of Automotive Engineers (SAE), the American Electronics Association, Semite, Joint Electron Tube Engineering Council and the American National Standards Institute (ANSI). Such standards developed by these bodies are overseen by the Institute of Electrical and Electronics Engineers (IEEE), the IEEE Standards Committee, as well as the electrical and electronics industry at large, who depend upon characteristic design standards for consistency in operation and performance. **To be considered standard, the** parts must be used within the published operating characteristics and environmental ranges for the part.

The proposal excludes programmable electrical and electronic parts such as programmable integrated circuits, hybrids, gate arrays, memories, etc.

Programmable logic devices are not discrete due to the programming required to control timing, functionality, performance and overall operating parameters.

The concept of establishing certain electrical and electronic parts as standard parts was released in the Federal Register for public comment (61 FR 47671; September 10, 1996). The comments were substantially supportive. Following a review of these comments, the FAA published in the Federal Register an

expanded interpretation of the definition of standard parts (62 FR 9923; March 5, 1997). Specifically the FAA broadened its interpretation of what is an acceptable specification for establishing conformity.

In the past the FAA only applied the exception in § 21.303 (b) (4) to standard parts that had specifications that contained information on the design, materials, manufacture, and uniform identification requirements. The specification had to include all the information necessary to produce the part and ensure its conformity to the specification. This application largely excluded classes of parts where the parts are conformed not on the basis of their physical configuration but by meeting the specified performance criteria.

Under this broadened interpretation, the FAA currently only recognizes discrete electrical and electronic parts that conform to their specifications as standard parts for the purposes of subpart K.

This NPRM proposes to codify this FAA interpretation into the regulations. The NPRM also stipulates that prior to a manufacturer declaring a part to be standard (excluding it from ~~the design approval requirements),~~**FAA manufacturing oversight)**, the FAA must make a finding that the airworthiness of the part can be established solely on the basis of meeting a performance only specification.

Also considered by the working group was how to handle electrical and electronic parts which are manufactured to exactly the same specification as the electrical and electronic part previously discussed, but which operate in an environment outside the published operating characteristics and environmental ranges for the part, such as those for temperature, humidity, etc. The group decided that these electrical and electronic parts, which are purchased as standard parts and then subjected to processing according to the desired environmental operating conditions, could no longer be considered standard parts as there are additional tests done to qualify the part. These parts would need a part number change and they would be supplied to production approval holders under their production approval as an approved supplier, or to the after-market under the production approval of the equipment manufacturer holding the design approval and the requirements for the desired additional processing.

The proposed wording of the standard part definition, which would be placed in § 1.1 of title 14 of the Code of Federal Register (14 CFR) is therefore as follows:

> **Standard part** means a part manufactured in conformance with one of the following:

1). A specification established by a government agency or consensus standards organization acceptable to the Administrator that -

a). Contains design, manufacturing, test and acceptance criteria, and uniform marking requirements.

b). Is made available so that anyone may manufacture that part.

2). A specification established and designated by a FAA design approval holder that is included in the type design and meets the following criteria:

(a). The specification contains design, manufacturing, test and acceptance criteria, and uniform marking requirements;

(b). The specification is available to any person so that anyone may manufacture the part; and

(c). The part is not subject to special quality assurance oversight

3). A specification that the Administrator finds will result in a part that can be conformed (airworthiness established) solely on the basis of meeting performance criteria and uniform marking requirements.

4). A specification for an electrical or electronic part produced in conformance with a specification published and maintained by a consensus standards organization, a government agency or a holder of a design approval; or in conformance with the manufacturer's internal specifications or standards. The internal specifications or standards must include manufacturing controls, quality and reliability test methods, and identification requirements; they may include acceptance test criteria. With the exception of parts manufactured to U.S. Military specifications, designs of which are controlled by the Defense Supply Center, Columbus (DSCC), the specifications or standards do not include electrical parameters and data which are obtained from the supplier's data sheet. The part is used within the manufacturer's published operating characteristics and environmental ranges.

During the process of establishing a definition of a standard part a difficulty arose with regard to certain types of parts (Briles rivets, Hy-Lock nuts, bearings and seals/o'rings, etc.); manufactured to specifications which are proprietary to the manufacturer. The specifications are not freely distributed

for anyone to make and, therefore, such parts do not meet the test for a standard part.

Since these proprietary parts are represented by thousands of part numbers to account for various lengths, diameters, thickness, grip length, etc. and installed on multiple type certificated products in multiple locations, the alternative of Parts Manufacturing Approval (PMA) was unattractive due to the burden which PMA application paperwork might create for the FAA. The FAA (AIR-100) recommended that we look closely at Technical Standard Order (TSO) as an alternative.

TSO products meet a performance standard. The proprietary fasteners, o'rings/seals and bearings also meet a performance standard, however, the standard specified varies according to length, diameter, etc. Shear strength, for example, varies with fastener diameter. In all other respects, these are large families of similar parts made from the same material and manufactured to the same process, finish, etc. They meet the TSO concept.

Small groups of fastener, bearing and o'ring/seal manufacturers, working under the authority of the ARAC Parts Working Group, prepared draft TSO's for recommendation to the FAA. The FAA determined that these TSO's would not require rulemaking and they were released in the Federal Register for public comment in March 1997 (62 FR 10107; March 5, 1997). The

comments were generally favorable with the exception of Transport Canada and the Joint Aviation Authorities both of whom objected to the increased regulatory oversight a TSO would involve. In dispositioning the comment of the foreign regulatory agency, the FAA determined that for the U.S. regulatory process there was no suitable alternative and proceeded with the TSO concept.

Although determined to be independent of rulemaking, the TSO concept for propriety design fasteners, o'rings/seals and bearings will remain in the ARAC Parts Working Group until the task assigned to the ARAC is complete.

Commercial Part: In addition to establishing a proposed definition for standard parts, the working group has proposed a definition of a "commercial part." Commercial parts are neither referred to in the FAA regulations nor in any advisory material yet the industry has used this terminology for many years when referring to such items as light bulbs, batteries, fire axes, smoke detectors, etc., that are included in the type design and which have been installed on type certificated products and accepted by the FAA as being exempt from the requirements of a production approval.

The definition of a commercial part proposed for § 1.1 is as follows:

Commercial part means a~~detail~~ part~~of subcomponent~~ included in the type design that is designated by the design approval holder based on the following criteria:

1). The part is not necessarily designed or produced for applications in commercial aviation; and

2). The part is manufactured to a specification or catalog description and marked under the identification scheme of the manufacturer.

Originally the definition considered by the working group would have required that the type certificate holder should designate parts as "commercial" to avoid the possibility of the manufacturer of a more sophisticated piece of equipment than a light bulb, advertising the part in a catalog and selling it as a commercial part. Subsequently, the working group voted to extend to all design approval holders the right to designate parts as commercial. At this point FAA General Counsel expressed the same concern as noted under standard part, expressing an opinion that design approval holders had no FAA-delegated right to make such a designation. Criteria by which FAA counsel might be comfortable with design approval holders designating parts "commercial" were embodied in the final proposed definition which was approved by the working group 100 percent.

Although at certain stages in the development of the definition of a commercial part, various working group members

expressed a sense of unease with the project, the majority of members voted in favor of proceeding with the definition work. It was realized that to expect manufacturers of light bulbs, batteries, resistors, etc., manufacturing millions of parts per day, to obtain PMA, was probably impractical and an exemption from FAA production approval requirements was essential.

In order to memorialize standard and commercial parts it is intended that by application of each definition (i.e. Standard or Commercial), the design approval holder will prepare a tabulation for submittal to the FAA Aircraft Certification Office (ACO) for approval and subsequent release to the public. Similarly, to maintain configuration control, parts so designated by the design approval holder as standard or commercial parts, will include in the tabulation the part description and part number and update periodically the tabulations to account for new products, substitutions or revisions to the specifications.

Section 21.1 Applicability

Paragraph (a)(1) of this section is proposed to be amended by more completely specifying all the pertinent contents of part 21, and using the term "design approvals" in place of the term "type certificates" to reflect the proposed split between design and production approvals for PMA parts and TSO articles. Proposed paragraph (b) of this section explains that the term

"production approval holder" is used to identify a holder of either a production certificate or a parts production approval. Proposed paragraph (c) explains what is meant by the broader term "design approval."

Under the proposed rule "design approval" means type certificate, supplemental type certificate, parts design approvals, and TSO design approvals. Paragraph (c) includes the statement that standard parts are excluded from parts design and production approval requirements, although they may be detail components of an approved design.

Proposed paragraph (d) broadens the use of "product" to include any appliance for which the Administrator issues a type certificate. This change is necessary to make part 21 consistent with 49 U.S.C. 44704(a), which allows the Administrator to "specify in regulations those appliances that reasonably require a type certificate in the interest of safety." Paragraph (e) proposes that "part" means an article; accessory; items for which the FAA has issued a Technical Standard Order design approval; airborne software, included as defined in the type design; and components and parts of a product or part.

Section 21.2 Falsification of applications, reports, or records

Paragraph ~~(a)~~(a)(1) and (a)(2) are proposed to be amended to make it clear that the FAA will treat the omission of a material

fact as seriously as a fraudulent or intentionally false statement. This change is intended to strengthen the ability of the FAA to ensure that design, production, and airworthiness certifications and approvals are accurate.

In addition, the public should be aware of the intent of paragraph (b) of § 21.2 with respect to potential FAA enforcement. Some have interpreted the absence of a reference, in the current rule, to enforcement actions other than suspension or revocation to mean that the FAA intended to limit its enforcement discretion in cases of falsification. However, the intent of that provision was and is to notify the public that falsification may result in the suspension or revocation of part 21 certificates or approvals that may not be directly related to the certificate or approval for which the falsification occurred, hence the use of the word "any." For example, a person might hold a production certificate for a type certificated product and also hold a PMA for a part eligible for installation on a completely different type certificated product. Falsification by that person with respect to the production certificate could result in revocation of both the production certificate and the PMA. The public should also be aware that falsification can be the basis for the assessment of a civil penalty.

Section 21.7 Compliance disposition

This NPRM would incorporate a new provision, § 21.7, Compliance disposition, which would state that the FAA could deny an application for a design or production certificate or approval to an applicant who lacks the care, judgment, or integrity necessary to hold the certificate or approval. The provision would apply when the applicant intends to fill, or fills, a key management position with an individual who exercised control over, or held, a similar position with a certificate or approval holder whose certificate was or is being revoked, and that individual materially contributed to the circumstances causing the revocation or the revocation process. "Key management position" would include the personnel described in § 21.149.

A denial of the application could also be premised on a finding that an individual who will have control over, or will have a substantial ownership interest in, the applicant had similar control over or interest in a certificate or approval holder whose certificate or approval was or is being revoked, and that individual materially contributed to the circumstances causing the revocation or the revocation process.

The proposed standards described above are similar to those contained in current § 119.39 of Title 14 of the CFR.

In addition, the denial could be premised on a finding that an individual in one of the capacities described above committed an act of falsification, in contravention of the relevant

provisions of Title 18 of the U.S. Code, the provisions commonly referred to as the Federal Aviation Act, or the Federal Aviation Regulations. For example, the FAA has discovered instances in which persons knowingly presented parts for airworthiness approval that have not been properly produced or inspected.

The safety of the aviation design and production system depends, to a large degree, on the truthfulness of certificate and approval holders. While the FAA monitors holders to the extent its limited resources allow, deliberate deceit by persons under, or purporting to hold, production approvals can and does occur, because such deceit is usually detected after the fact, if at all. Amendment 21-70 (57 FR 41360; September 9, 1992) addressed this problem in part by establishing sanctions for falsification of applications, reports, and records.

However, the FAA believes that it is appropriate to further strengthen its regulatory safeguards. The FAA needs to deny a certificate or approval to an applicant that attempts to employ a key management individual, or is subject to the control of another, who has committed an act of misconduct. The commission of such an act demonstrates a contemptuous disregard for the law, and it is reasonable to conclude that such a person cannot be relied on for future compliance with the requirements incumbent on a certificate or approval holder.

The FAA has, on occasions, found itself in the position of receiving applications for new certificates or approvals from persons with known criminal records or histories of non-compliances with FAA regulations; this proposal would address those kinds of situations. This proposal would prevent a company, whose certificate or approval has been, or is being, revoked for non-compliances due to misconduct, from simply changing its name but retaining the same employee(s) responsible for the original misconduct. This would apply to any certificate or approval issued under any provision of Title 14 of the CFR, including certificates or approvals issued by either the FAA or the Office of the Secretary of Transportation.

This proposal would apply to each application for a certificate or approval in process on or after the effective date of the final rule, if adopted, even if the disqualifying conduct is found to have occurred before the effective date.

Finally, the proposal would also address the situation where a certificate or approval holder has employed an individual in a key management position, or an individual has obtained control over or a substantial ownership interest in the holder, and the Administrator finds that the individual is in a position to materially affect the holder's ability to comply with part 21 and has committed an act of misconduct. Unless the individual's involvement in the current holder is otherwise approved by the

Administrator, the certificate or approval holder would be subject to enforcement proceedings if the individual continues in that position. This part of the proposal would mean that the kinds of circumstances that the Administrator would consider potentially disqualifying for an applicant for a certificate or approval, should not be created after the FAA issues the certificate or approval.

Section 21.45 Privileges

Section 21.45 is proposed to be amended to correct a typographical error in paragraph (b) by changing "or certificated aircraft" to "on certificated aircraft" and by changing the cross-referenced sections in paragraph (c) to coincide with the changes to subpart G contained in this document.

Subpart F - Production Under Type Certificate Only

Present subpart F of part 21 allows for production under a type certificate. The present subpart F production under TC provisions normally cover the period between issuance of a type certificate and issuance of a production certificate. The FAA proposes to delete subpart F since under proposed § 21.135(c) an applicant for a production approval who wishes to proceed with the manufacture of a limited quantity of products or parts prior to obtaining the design approval and production approval would be

able to do so provided certain conditions are met. Also, under subpart F, the FAA issues an ~~APIS~~**approved production inspection system (APIS)** provided certain requirements are met. The APIS is a production approval for producing the same type of products that can be produced under a production certificate. Although APIS and PC use different terms to describe the quality control requirements, the two quality control requirements contain the same basic controls. For this reason and the fact that there are very few APIS holders as compared to PC holders, the FAA proposes to eliminate the dual production approval system. All persons who wish to produce products would have to obtain authorization under proposed § 21.135.

As noted above, under the proposed regulation, a manufacturer must have a production approval under § 21.135 to produce aviation products or parts. As part of the production approval process, the FAA may grant a production approval similar to production "under type certificate only" which invokes limitations on a manufacturer until that manufacturer demonstrates compliance to all quality assurance system requirements to the satisfaction of the FAA. Those limitations, which (at the discretion of the FAA) may include the specific tests and conformity inspections in the current Subpart F, would be specified on the production limitation record under proposed § 21.137(b). It should be noted that the MRB section in the

current Subpart F has been incorporated into the quality system requirements for all production approval holders (proposed § 21.160).

Subpart G - Production Approvals

The FAA proposes a complete revision of subpart G, which now covers the issuance of production certificates. The goal of the proposed revision is to create a single uniform production approval process and single quality systems appropriate to the products, parts and articles for which the design approvals are held. Under the present rules, quality control is addressed under four subparts. Current subpart F contains quality control (production inspection) requirements for persons who hold a type design and who **either** want to~~obtain an APIS so that they can~~ manufacture before they have obtained a production certificate **or who want to obtain an APIS**. Subpart G contains quality control requirements for persons who hold a type design and who want to obtain a production certificate. Subpart K contains quality control (fabrication inspection) requirements for persons who wish to produce materials, parts, processes, and articles under a Parts Manufacturer Approval. Subpart O contains quality control requirements based on subpart G requirements for persons who produce parts or articles under a TSO authorization. A detailed discussion of each section in proposed subpart G follows.

Section 21.131 Applicability and compliance

Proposed § 21.131(a) would state the broader coverage of subpart G to include within production approvals both production certificates for products and parts production approvals for parts and articles currently manufactured under a PMA or TSO. Thus throughout this preamble and the proposed rule wherever the term "production approval" is used readers should keep in mind that it includes both production certificates and parts production approvals.

Proposed § 21.131(b) is a new provision that would provide a two year period after the effective date of any new rule for transition from the present production approval requirements to the new requirements. This provision would require all present production approval holders within the two-year period to show that their quality systems meet the new requirements of part 21. The FAA would develop guidance materials, such as an Advisory Circular to tell approval holders how to make this showing. The FAA would review the approval holder's quality manual and conduct on site evaluations as necessary. The approval holder should be prepared to show the FAA what changes have been made to comply with the new rule. The FAA expects that the quality systems of some approval holders already meet the new requirements. The

current design approvals for a type certificate, PMA, or TSOA would not require review.

Proposed § 21.131(c) would replace current § 21.303(a) as the basic prohibition against production without an FAA production approval. Current § 21.303(a) prohibits a person from producing a part "for sale for installation on a type certificated product" unless the part is produced pursuant to a PMA or the part comes under an exception in § 21.303(b). The intent described in "for sale for installation on a type certificated product" is, in many instances, difficult to prove.

Therefore, the FAA proposes to adopt a prohibition that would be violated only if the producer represents that the product or part is suitable for installation on an FAA type certificated product, such as an aircraft, or on an FAA approved part, such as an article. This would be a more objective standard, which the public could more easily understand, and the FAA would be more capable of developing the evidentiary record necessary to prove a violation. Note that the proposal would state "suitable" for installation on an FAA type certificated product or FAA approved part, rather than the more specific word "eligible," which connotes that the FAA has already made a determination. The FAA intends to allow the producer to imply that the part, if installed, would return the product or other part to its "original or properly altered condition" only if the

part is produced under the appropriate FAA certificate or approval, or under an exception stated in paragraph (d). Accordingly, a producer's statement that the part is "equal to" or "as good as" one produced under an approval could result in producer liability.

Paragraph (d) would state the exceptions to § 21.131(c). The first would except a "standard" part, as defined in §1.1. This exception would be similar to current § 21.303(b)(4). The second would except a part "produced by ~~an~~ owner or operator for maintaining or altering the owner's or operator's product or [other] part." This exception would be similar to current § 21.303(b)(2), but would also incorporate a definition of the salient phrase; the definition is derived from an interpretation that was previously made publicly available by the FAA, but not published in the Federal Register. The third would except a part that is produced by a person certificated by the FAA to perform maintenance or alteration on a product or another part under that person's certificate. This exception would be required because the basic prohibition on production no longer would be premised on the producer's intent to produce a part for sale for installation on a type certificated product. The exception would be incorporated to acknowledge that a repair station or airman is required, ~~when the~~ product or part is returned to service after

authorized maintenance or alteration, to represent a part's suitability for installation on that product or part.

While some Working Group members recommended that the exception for owner/operator produced parts should be limited, such as to parts produced for experimental aircraft or for older small aircraft no longer in production, the ARAC did not recommend any such limit. Thus, this proposal is consistent with the current rule and the current FAA policy as stated in Order No. 8110.42. However, as stated in this proposal and that order, if a part is offered for installation on a product other than the owner's or operator's, then a parts production approval would be required.

Section 21.133 Eligibility

Proposed § 21.133 is mostly based on present § 21.133 with some additions to cover the broadened coverage of subpart G. Section 21.133(a)(1)(i) is based on present § 21.133(a)(1), but uses the term "design approval" rather than "type certificate" or "STC." This change is proposed because persons who manufacture under a PMA or a TSO do not obtain a type certificate. Under the proposed rules, the design approval issued under subpart K for parts would be called a "Parts Design Approval" and the design approval issued under subpart O for TSO articles would also be called a "Parts Design Approval." The design approvals issued

under subparts B and E would continue to be called "type certificates" and "supplemental type certificates," respectively. Proposed § 21.1(c) lists the types of design approvals covered by part 21.

Proposed § 21.133(a)(1)(ii) is based on current § 21.133(a)(2), but again, the language would be modified. The current rule language refers to persons who have rights to the benefits of a type certificate "under a licensing agreement." The proposed language is "written authorization to use the existing design approval." "Design approval" is used for the reasons already stated. "Written authorization" is used rather than "licensing agreement" because it more simply expresses the requirement that the applicant for a production approval have written legal authority from the holder of the design approval. When the applicant is seeking a production approval under the written agreement, the agreement would reflect the design change responsibilities between the parties. However, the essence of the agreement is to identify the existing approved data as being that design data in the approved design of the writer of the agreement and that the data is in the possession of the applicant. That data does not change effectively irrespective of changes in the agreement. Subject only to the controls of the Administrator through Airworthiness Directives, the data remains approved data. The issuance of a written authorization for one to

use an approved design for purposes of applying for a Parts Production Approval is a means of communicating to the Administrator that the applicant is in possession of the approved design data for the part or product concerned. While such written authorization may be the subject of a business relationship between the Design Approval Holder and the applicant, withdrawal of the business agreement does not change the design of the part or product being produced. It will impact the § 21.141(d) reporting requirement and would require the PPA Holder to inform the Administrator. The Production Limitation Record for such PPA Holders may reflect that all MRB and reporting under §21.3 must be coordinated with the Design Approval Holder and the withdrawal of such support may require additional application information from the PPA Holder.

Proposed § 21.133(a)(2), which is included for harmonization, would add to the eligibility requirements specific language that would require the applicant to have manufacturing facilities or to maintain quality surveillance over manufacturing facilities capable of producing the product or part for which approval is sought. Proposed new § 21.133(a)(3) would require the applicant to establish and maintain a quality system that meets proposed § ~~21.145 at a manufacturing facility within the United States. While new specific language would be added to~~

~~§ 21.133, this is not considered a new requirement because it is stated in current § 21.137 and~~ **21.145.**

~~is stated in current subparts K and O.~~

Proposed § 21.133(b) is based on present § 21.133(b), but refers to a "production approval" rather than to a "production certificate."

Section 21.135 Issuance of production approval

Proposed § 21.135(a) and (b) are virtually identical to present §§ 21.135 and 21.149, respectively, except that they are broadened to include parts production approvals presently in § 21.303(d)(2) for PMA's and in § 21.605(c) for TSO articles. Proposed § 21.135(c), while new, is in effect partly based on present subpart F of part 21 in that it would, as previously discussed, provide for the temporary manufacture of a product or part before a design or production approval has been issued. The ability of a production approval holder to use its approved quality system for the production of parts to be used in the design approval process and during the interim between the issuance of the design approval and the Production Limitation Record amendment, is a recognition of an existing approach used by essentially all production approval holders. This enables delivery of parts and products as soon as the design receives FAA approval. To exercise this capability using an approved quality

system, the PAH must be in the process of furthering the design by actual development of the new part or product. Any limitations on the use of the producer's quality system, or the imposition of any additional inspections and tests required by the Administrator, would be noted on the Production Limitation Record, as specified in proposed § 21.137(b). The limited quantity to be produced under these circumstances must be reasonable to the product or part to be developed and approved. The specific quantities and duration of the process must be acceptable to the Administrator. The FAA plans to issue advisory material covering the kinds of details that are in present subpart F but would not be included in proposed § 21.135(c).

A system to manage this limited production at the production approval holder (PAH) who is the developer of new products must be part of the approved Quality System for that PAH. The extent of the controls to be in place for such an approval would be defined in advisory material but must include the configuration control of the product or part from the design inception. All component and part release must include the identification of those parts developed for testing purposes only as distinguished from those intended to be used in the approval process. Provisional Approval would be provided only to those PAH's that have an approved system to manufacture like products or parts to the new one being developed. Provisional Approval would permit

the PAH to fully utilize the approved manufacturing processes Quality System for the production of the approval material used for any tests necessary for design approval of the new product or part. After production approval these limited ~~production parts~~**Parts Production** are eligible for airworthiness approval.

All parts/components that leave the direct control of the PAH must be released under an approved system of tracking and be subject to recall in the event any particular part or component is not used in the final approved product or part. The documentation accompanying any pre-approval released parts must reflect the conditional release status of the part/component and the part is not to be considered airworthy until a subsequent notification of the completion of the approval process for the new product or part. All parts/components that are pre-released and subsequently determined to be not suitable for approval purposes must be recalled in accordance with the PAH's approved recall procedures, upon that determination.

Proposed § 21.135(d), which relates to manufacturing facilities located outside the United States, is based on current §§ 21.137, 21.303(g), and 21.601(c), which state that the Administrator does not issue a production certificate, PMA, or TSOA for manufacturing facilities located outside the United States unless the Administrator finds no undue burden on the United States in administering the applicable statutory or

See 59 which is positioned after 61 and in front of 62.

A consortium may also have one or more partners which hold a foreign Civil Aviation Authority (FCAA) production approval for the same type of product or part. The FAA should allow such a partner the same consideration and privileges as a partner which holds an FAA production approval, as long as there is FAA recognition of the FCAA (through a bilateral airworthiness agreement or equivalent) and agreement by the FCAA to perform surveillance on the consortium products and parts.

Section 21.137 Production system limitations

The first two sentences of the introductory paragraph of proposed § 21.137 are virtually identical with present § 21.151. Proposed paragraphs (a) and (b) are new and would prescribe the details that must be included in a production limitation record (PLO). The details are needed in the regulation so that the PLR would contain the approved listings separate from the design approvals. Today these are handled by issuing supplements to PMA and TSOA holders. The intent is to limit the PLR to those products, parts and articles that are referenced in the design

When a consortium is comprised of two or more partners which hold existing FAA production approvals for the type of product or part to be produced under the consortium's production approval, special consideration should be given to the consortium. That special consideration could include: use of the partners' FAA designees for conformity inspection (and other FAA functions given to designees) of consortium products and parts; direct use by the consortium (by reference in the consortium's quality assurance procedures) of the partners' quality assurance systems; use of the partners' inspection symbols and trademarks to meet part 45 requirements; and FAA surveillance of consortium products as part of the surveillance (including ACSEP) of each partner.

Any partners of the consortium that do not hold an FAA production approval must be treated as a supplier to either the consortium or to one of the partners which hold an FAA production approval. The consortium must maintain a central office to interface with the FAA on all engineering, continuing airworthiness, manufacturing, and quality assurance matters involving the consortium and its products or parts.

inconsistency in application and an inability on the part of industry to determine when it would be invoked. The clause remains and the FAA has committed to develop advisory material that would clearly define the requirements to overcome the undue burden.

In a related action, the FAA published a final rule on October 27, 1997 (62 FR 55696) that establishes fees by voluntary agreement for production certification-related services pertaining to aeronautical products manufactured or assembled outside the United States.

Proposed § 21.135(e) addresses circumstances under which parts can be manufactured outside of the United States, assuming that the Administrator has found no undue burden under proposed § 21.135(d). The specific language for TSO articles in proposed § 21.135(e)(1) and (e)(2) is based on current § 21.617.

There was considerable discussion within the Production Certification Working Group about adding a separate section in the regulation on production approval held by a consortium. Although it was decided not to incorporate such a section in the regulation (since a consortium must meet all production approval requirements), there was overwhelming support to address this issue in the preamble, and assure follow-up in directives and advisory circulars (as needed).

regulatory requirements. The Production Certification Working Group wanted to eliminate the FAA "undue burden" clause due to an

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FAX TRANSMITTAL

Total Pages 4 (Including Cover)

TO: Bill Schultz, Assistant ARAC Chair, Aircraft Certification Procedures Issues

FROM: Aircraft Electronics Association, Governmental and Industry Technical Representative

DATE: January 21, 1999

SUBJECT: Objecting to elements of "Production Certification and Parts Manufacturing" NPRM, dated November 6, 1998, and registered negative vote to adopt

On behalf of the Aircraft Electronics Association (AEA) and its member companies consisting of avionics equipment and appliance manufacturers, distributors, certificated repair stations, and Designated Alteration Stations, we register the vote of NO to adopt the NPRM for the following reasons:

1. The NPRM removes the previous privilege of thirty (30) days for production approval (TSO authorization) of applications found to meet the standards of or any authorized deviations for issuance of TSO. The previous procedures allowed a manufacturer of an appliance to obtain design and production approval providing that such technical data submitted met the requirements and that the applicant could show that a production quality control system had been established and approved by the Administrator. A TSO manufacturer's production quality control system requisite met the requirements of Subpart G - Production Certificates, and for initial issuance and provided for continuous inspections under ACSEP audits. Removal of this privilege jeopardizes a qualified manufacturer from making available to the market, satisfactorily designed and manufactured appliances. The Working Group failed to make a satisfactory technical or safety argument for making such change and also failed to observe the impact to small business in its analysis.

2. The NPRM fails to define the word "article", as used as a subordinate to "part" as observed on page 125 of the NPRM. AEA filed a "Minority Position Opposing Certain Elements" in respect to this issue. See attached memorandum letter dated October 24, 1996 to Don Van Burkleo, Chairman, that identifies in the second paragraph, such deficiency and potential consequences if not in agreement with the FAA act. Failure to define article complicates possible reciprocity in obtaining a letter of TSO design approval for foreign manufactured appliances or conveying a JTSO with foreign authorities. Such action may have consequences in import of parts or products, including appliances, into JAA operating countries, since NPA 21-7 and Subpart N of JAR 21 does not observe "articles" in its lexicon whereby an appliance is not a "part".

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TO: Don Van Burkleo, Chairman, Production Certification Working Group

FROM: Aircraft Electronics Association, Governmental and Industry Technical Representative

DATE: October 24, 1996

SUBJECT: Minority Position Opposing Certain Elements

On behalf of the Aircraft Electronics Association (AEA) and its member companies consisting of avionics equipment and appliance manufacturers, FAA certificated repair stations, and Designated Alteration Stations, we register the following formal Minority Position Opposing Certain Elements with attached comments. While AEA supports the general goals which the Production Certification Working Group is attempting to achieve, AEA will not support the effort to remove Subpart O nor any of the parts of Technical Standard Order (TSO) from 14 CFR Part 21 for reassignment within Subparts G and K (proposed F) of this chapter.

Counsel has advised the AEA that the inference of "articles" misrepresents "appliance" as defined within Part (1) of this chapter and [44102] of the recodified FAA Act, wherein stated "an(y) instrument, (mechanism), equipment, [a] part, apparatus, [an] appurtenance, or [an] accessory (used), [capable of being used, or intended to be used,] in operating or controlling an aircraft in flight, [including a parachute, communications equipment, and another mechanism] installed in or attached to (the) aircraft [during flight], and (is) not part of the [aircraft] (airframe), [aircraft] engine or propeller". (emphasis added). This is not consistent with "articles" referred to in the proposed Subpart K on Page 90 of the proposed TRG Draft, dated August 30, 1996.

Further, the omission of a means to qualify an appliance type design which is qualified under a published minimum performance standard requirement is mutually exclusive to qualifying a part, which has no minimum performance requirement or standard, other than those provided for in "standard parts". ((see §21.303(b)(4) of this chapter)). (emphasis added).

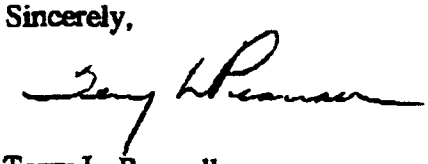
It is regrettable that the Working Group has expended effort to promote this action. While AEA is sympathetic to one Working Group member, whose company [person] was not able to protect its interest in transacting a TSO with its geographic aircraft certification office, AEA is reminded that if satisfaction is not realized or inequitable treatment is experienced, such company [person] may seek alternate aircraft certification offices within which to apply for and process its TSO.

In closing, AEA has repeatedly objected to the aforementioned actions taken by the Working Group who insisted on "leveling the playing field" without justifying their reasons for change. Failing to make the safety case alone is sufficient evidence that removal of the TSO production approval from the TSO design approval aspects is quantifiably undesirable.

I regret that I could not attend the Issues Group meeting and appreciate your registration of AEA's vote.

Thanks for your consideration and with kindest regards.

Sincerely,



Terry L. Pearsall
Government and Industry Technical Representative

The action to remove Subpart O and consolidate the tenets of processes and requirements into Subparts G and K (proposed F) seems to only divide a process of effective application and due process for applicants for TSO. TSO applicants and holders of TSO authorizations are afforded privileges and are required to self-manage and control the configuration of their design data. Such privileges and requirements, if TSO were adopted within Subpart K (proposed F), would be diminished and the burden shifted to the FAA for evaluating and analyzing TSO applicants and TSO holders design data. This would be prohibitive in view of the current FAA obligations to provide intangible services to industry.

The FAA is currently reviewing its policy for processing TSO applications. Such action will result in a change to FAA Order 8150.1A. AEA has the assignment to assist the Working Group with recommended language on the revision to Order 8150.1A, which is consistent with its goals to improve the TSO processes. Order 8150.1( ) is the mechanism to improve the TSO system and force uniform practices among the Aircraft Certification Offices in processing TSO applications and issuing TSO Authorization.

AEA requests that this Minority Position Opposing Certain Elements be entered into the preamble of the proposed notice of proposed rulemaking (NPRM) titled "TRG Draft: August 30, 1996. AEA further requests that the Aviation Rulemaking Advisory Committee, Production Certification Working Group act responsibly to revise the proposed NPRM to reestablish the TSO application and authorization processes under Subpart O.

Thank you for your attention and compliance with our requests.

Respectfully Submitted

Terry L. Pearsall
Governmental and Industry Technical Representative

cc: Mr. John Lundin, Counsel
Mr. James Lauer, Chairman, AEA
Ms. Paula Derks, President AEA
Ms. Angela Washington, FAA
File

1/20/99

Airline Suppliers Association
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AIRLINE SUPPLIERS ASSOCIATION

Memorandum

To: Aviation Rulemaking Advisory Committee

From: Jason Dickstein, Airline Suppliers Association

Re: Minority Opinion to the Draft Regulations Proposed by the Parts and Production Approval Working Group: Commercial Part Definition

§ 1.1 - Commercial Part Definition

The Airline Suppliers Association (ASA) objects to the proposed definition of a "commercial part" on three grounds: the proposed definition does not have any regulatory effect, the proposed definition does not represent current industry practice, and there is no genuine safety justification for modifying the rule.

I

Issue I resolved by amendment to proposed 14 C.F.R. § 21.131 (a)(1) Jason Dickstein 1/21/99

~~The term "commercial part" is not currently used in the existing federal aviation regulations, nor is it used in the proposed regulatory changes. Since the term is not used in the regulations, there is no need to define it.~~

II

The term in question is currently used in a colloquial fashion by the industry to describe parts that are not manufactured with the intention that they be offered for sale for installation on a type certificated product. These are parts that fall outside the scope of the current rule 14 C.F.R. § 21.303(a). People in the aviation industry generally use the term "commercial part" to mean a part that falls outside the FAA's regulatory scope - one that is not manufactured for sale for installation on a type certificated product. The proposed definition would change this usage. It would narrow the scope of this term, excluding a class of parts that fall outside of the scope of 14 C.F.R. § 21.303(a), but do not meet the

approval for type certificated products, parts, and articles. Component parts of approved parts would be included in the design approval, but would not be separately listed in the PLR.

Under proposed § 21.137(a), the PLR would have a "ratings" section which would reflect the parts or products authorized to be produced under the production approval. For current production certificate holders, the list of approved products and their corresponding type certificate numbers on their existing PLR would remain the same. For current PMA and TSOA holders, the list of approved parts under the PPA would be the same as their current authorized list, but there would be an additional column identifying the design authorization for each manufacturing approval (since the authorization of design and manufacturing would be separated for these products).

Under proposed § 21.137(b), for both PPA and PC Holders there would be an additional "limitations" section of the PLR to list all special limitations on the production system based on existence and scope of the approval holder's quality system elements. If an applicant has a production quality system that does not fully meet the proposed Subpart G, the PLR would list resulting restrictions imposed by the FAA. These restrictions could include the inability to utilize certain systems (e.g., if the Material Review Board procedures are not acceptable, DER's must be used to approve use of nonconforming material) or could

impose additional inspections and tests similar to tests required under the current Part 21 Subpart F). For example, under proposed § 21.139(a)(2), a production approval holder may issue an airworthiness approval for products (other than aircraft) or parts produced under the production approval; however, if the production approval holder does not have an FAA approved system to issue such airworthiness approvals (see proposed § 21.141(i)), the FAA can restrict or revoke this privilege in the limitations section of the PLR.

Section 21.139 Privileges

Proposed § 21.139(a)(1) is partially based on current § 21.163(a)(1). Proposed § 21.139(a)(2) would allow a production approval holder to issue an airworthiness approval for products other than aircraft (i.e., engines and propellers) or parts produced under a production approval.

Under the proposal, PAH's would be allowed to issue Airworthiness Approvals utilizing PAH selected employees to act on behalf of the PAH as a representative of the Administrator. The reason for this proposal is that, by virtue of the production approval, PAH's currently make a determination of airworthiness acceptable to the FAA for domestic shipments. This proposal takes credit for that determination of airworthiness for all shipments, thereby providing flexibility with the PAH system

while relieving the FAA from administrating the designee system for airworthiness approvals at those PAH's. The PAH would have the responsibility for establishing and maintaining the system for issuing airworthiness approvals; this system would be subject to approval and audit by the FAA.

Proposed § 21.139(a)(3) would explicitly allow a production approval holder to perform maintenance or preventive maintenance of products not yet released to service under the production approval without the need for a repairman or mechanic certificate. This section has been added in order fill a gap in the current regulation, and harmonize with the Joint Airworthiness Authorities.

It has generally been the interpretation of the FAA that once a product ~~leaves the control of the production approval holder,~~**is issued an airworthiness certificate**, it immediately falls under 14 CFR part 43. According to § 43.3, a manufacturer may only alter or rebuild; there is no provision for a manufacturer to perform maintenance and preventive maintenance in part 43. Instead, a production approval holder may without further showing obtain a Manufacturer's Maintenance Facility (MMF) license under 14 CFR part 145, subpart D, which would allow that production approval holder to perform maintenance and preventive maintenance on its own product if it employs an FAA

certificated repairman or mechanic directly in charge of the maintenance or preventive maintenance.

According to § 43.1, however, part 43 only applies to— aircraft having a U.S. airworthiness certificate; foreign-registered civil aircraft used in common carriage or carriage of mail under the provisions of part 121, 127, or 135; and airframe, aircraft engines, propellers, articles, and component parts of such aircraft; and it does not apply to an aircraft for which an experimental airworthiness certificate has been issued, unless a different kind of airworthiness certificate had previously been issued for that aircraft.

There are occasions when engines, propellers, and parts made by a production approval holder and delivered to an aircraft manufacturer~~for installation in a new aircraft~~ may require maintenance or preventive maintenance **prior to leaving the control** ~~either prior to installation on an aircraft or prior to the airworthiness certificate being issued for~~**of** the aircraft ~~on which these products or parts are installed.~~ **manufacturer**. As noted above, under current regulation authorization for maintenance or preventive maintenance of these products and parts is not covered by either part 21 or part 43, however common practice has been to require the work to be performed under part 43.

The intent of the proposed regulation is to explicitly state that a manufacturer may perform maintenance and preventive maintenance on these parts under its manufacturing approval. This would allow the manufacturer to perform work under its quality assurance system (without repairmen or mechanics), and would assure that the work is done to manufacturing standards and tolerances, so that the aircraft, when delivered, would meet all new product standards. This would also resolve a conflict between JAA requirements and current FAA practice on this issue.

Proposed paragraphs (b) and (c) of § 21.139 are derived from comparable requirements in Transport Canada's regulations. Proposed paragraph (b) would allow a production approval holder who is proceeding with a design approval for a new product or part that is similar to those on the production limitation record to, without further showing, manufacture under its production approval a limited quantity of products or parts prior to meeting all of the requirements of subpart G including all elements of the approved quality system. After design approval these limited ~~production parts~~**Parts Production** would be eligible for airworthiness approval, as specified in § 21.329(c). Similarly, under proposed paragraph (c), a production certificate holder who is proceeding with a design approval would, without further showing, be allowed to issue airworthiness approvals as specified in proposed § 21.333. That section states that the airworthiness

approvals may be issued only when the production certificate holder has an acceptable means of recalling products or parts that are not approved as part of the subsequent design approval. If the production certificate holder does not have such a system, an entry should be made in the limitations section of the PLR to restrict the production certificate holder from issuing these airworthiness approvals. Since an airworthiness approval must be issued for each shipment of products or parts (see proposed § 21.141(h)), this privilege would allow a production certificate holder to release parts prior to design approval. The option for a production certificate holder to release such parts, though not specified in current regulation, has been available since 1992, as documented in Advisory Circular 21-23A "Control of Products and Parts Shipped Prior to Type Certificate Issuance". There was considerable discussion during the ARAC process whether or not to extend this privilege to all PAH's, and it was decided to restrict this privilege to only production certificate holders. This was based on the fact that only production certificate holders have demonstrated the need to pre-position products (other than aircraft) and parts prior to design approval. It should be noted that all other PAH's may manufacture parts prior to design approval (under proposed §§ 21.135(c) and 21.139(b)), and may ship those parts with airworthiness approvals as soon as the design approval is granted.

Proposed § 21.139(d), which relates to training and the issue of competency certificates by the holders of production certificates for specified aircraft categories, is based on present § 21.163(b).

Section 21.141 Responsibility of the production approval holder

Proposed § 21.141(a) concerning documenting, maintaining, and assuring compliance with the quality system is based on present § 21.165(a). Proposed § 21.141(b), which concerns notifying the FAA in writing of changes to a quality system or location of a manufacturing facility, is based partially on present § 21.147 and partially on § 21.303(j). Notification in writing would include electronic communication. Proposed § 21.141(c), which would require the holder of a production certificate or parts production approval to determine that each completed product or part conforms to the approved design and is in condition for safe operation, is based on present §§ 21.165(b), 21.303(k), and 21.607. Although the language of proposed paragraph (c) is more general than in these present sections, it would have the same substantive effect and would apply to products and parts produced by present PMA holders, TSOA holders, and production certificate holders, including primary category aircraft assembled under a production certificate by another person from a kit provided by the production certificate

holder. Proposed § 21.141(d), which would require that the production approval holder report to the design approval holder, if different from the production approval holder, all deviations from the quality system necessary for analysis and possible reporting under § 21.3, is based on the need to ensure that persons responsible for the original design and who hold the design approval are kept informed.

Proposed new paragraphs (e) through (m) of proposed § 21.141 would include the following responsibilities for production approval holders:

1. Reporting to the design approval holder (if different from the production approval holder) all undocumented nonconforming products or parts which could have left the quality system. This proposal would assure continuing communication between the production approval holder and the design approval holder when they are separate entities.

2. Maintaining a complete and current technical data file consisting of all the approved data and manufacturing processes for each product or part manufactured under the production approval. The file would be retained for the period of manufacture of the part or product or as agreed upon with the Administrator. This requirement currently exists for TSOA holders (§§ 21.607(c), 21.613).

3. Maintaining complete quality records for 2 years for manufactured products or parts and 10 years for critical components as defined under 14 CFR 45.14. Except for critical products, comparable requirements currently exist in §§ 21.303(h)(9) and 21.613.

4. Issuance of an airworthiness approval (in accordance with proposed subpart L) for each shipment. This would provide a standardized "birth certificate" for each part or batch of parts, as recommended by the FAA/Industry Suspect Unapproved Parts (SUPs) Steering Group. Issuance of airworthiness approval documentation is an expressed desire of the industry to provide documentation from the original manufacturer for the parts shipped. The use of the FAA Form 8130-3 is proposed for providing this documentation with each shipment. The issuance of such documentation, domestically, is optional today, at the request of the purchaser of such parts. This change would make it a requirement. An increasing number of manufacturers are providing this documentation today as a service to the industry.

5. Assuring that only authorized personnel issue FAA airworthiness approvals.

6. Maintaining proper maintenance records for 2 years for all products or parts that have not been released-to-service but have been maintained under a production approval as would be allowed under proposed § 21.139(a)(3) on products of their own

manufacture and by personnel from the manufacturer's operations. For cases where maintenance is necessary before a customer gets the product, the record should be made of all maintenance performed.

7. Mark products in accordance with part 45. This proposal would clearly tie the responsibility to mark products to the PAH and is based on present § 21.607(d).

8. Allow the Administrator to make inspections, tests, and investigations at its facilities or any supplier facilities necessary to determine compliance with applicable regulations. This requirement is found in present §§ 21.157, the introduction to 21.303(e), and 21.615.

9. Display the approval and ratings at an accessible place in the manufacturing facility. Proposed paragraph (m) is based on present § 21.161.

As previously noted, many of these proposed provisions are based on existing requirements, most of which do not apply to all PAH's. The goal is to standardize the requirements for all PAH's, building on the best current requirements.

21.143 Amendments, transferability, and duration of a production approval

Proposed § 21.143(a) is a slightly reworded version of present § 21.153 which addresses amendments of production

certificates only. Proposed paragraph (b) states, as does present § 21.155 for production certificates, that a production approval is not transferable. This paragraph is also based on present §§ 21.303(i) and 21.621. Proposed paragraph (c) deals with the duration of a production approval and is based on present §§ 21.159, 21.303(i), and 21.621, except that the requirement that a production certificate would terminate if the location of the manufacturing facility is changed, is deleted. Rather than terminating a production approval when a facility is moved, the FAA would amend the approval once it is determined that the quality system remains adequate.

21.145 Quality system

Proposed § 21.145 is based on present §§ 21.139, 21.303(h), 21.605(a)(3), and 21.607(b) with new language that would require that documentation must be in a retrievable form acceptable to the Administrator. The term "retrievable form" allows for the use of computer or other electronic format, that may be used instead of printed documentation as long as the form is acceptable to the Administrator. The proposed language is also broader to cover "approved design" rather than "type certificate" since this subpart would apply to parts for which type certificates would not be issued.

21.147 Quality system documentation

Proposed § 21.147(a) is new and contains a detailed listing of all of the elements that would be required for quality system documentation. Proposed § 21.147(b) is new and contains details of how an applicant for a production approval would be required to establish and maintain a system for receiving and processing feedback on service problems.

21.149 Management responsibility

The proposed requirement in § 21.149(a) that each applicant shall appoint a management representative with defined authority to ensure implementation and compliance with the quality system is based on existing JAR and ISO requirements.

Proposed § 21.149(b) is based on current § 21.143(a)(1).

21.151 Design and data control

Proposed § 21.151 would require each applicant for a production approval to establish and each holder to maintain procedures for the control of design data and subsequent configuration control to ensure that only approved current and correct configuration data is used for parts and products produced and processes performed under the authority of the production approval. These procedures would be required to include a method to ensure conformance of products manufactured

under a pending design or production approval pursuant to the provisions of § 21.135(c). The proposed language is based on present §§ 21.143(a)(5), 21.303(h)(6) and (h)(7).

21.153 Document control

Proposed § 21.153 is a new requirement that would require each applicant to establish and each holder to maintain procedures to control documents and data that form a part of the quality system, as well as any subsequent changes to the documents and data. The required procedures would have to ensure that documents and data are reviewed by appropriate personnel prior to incorporation into the quality system. The documents to be controlled will be those that establish the approved quality system, as well as those documents that define and document the quality of the parts or products, including manufacturing processes when appropriate.

21.155 Supplier control

Proposed § 21.155 is based on present §§ 21.143(a)(2) and (b), and 21.303(h)(1) and (h)(2) but contains more detail concerning the procedures that would be established and maintained to ensure conformance of supplier furnished products, parts, materials, and services to the approved design prior to release for installation. The goal of this proposed requirement

is to put the burden on the applicant to ensure that each supplier has a quality control system that is appropriate for the complexity of the products, software, parts, materials, or services supplied to the production approval holder.

21.156 Process control

Proposed § 21.156 is partially based on present §§ 21.143(a)(3), and 21.303(h)(4) and (h)(5) and is intended to require applicants to document and holders to maintain the processes, where applicable, established to ensure the manufacture and assembly of products of a quality that is consistent with the approved design. For example, in some instances the process can be a particular heat treat or coating process. If the applicant does not have the correct process, it cannot make the part.

21.157 Inspecting and testing

Proposed § 21.157, which would require an applicant to establish and each holder to maintain procedures for inspection and test activities to verify conformity of products and parts to the approved design, is partially based on current §§ 21.143(a)(3) and 21.303(f). The goal is to establish a broadly worded test requirement that allows for flexibility and for change as is appropriate to an applicant's or approval

holder's situation. The applicant would have to document procedures to ensure the conformity of parts not inspectable upon receipt from suppliers. Also the applicant would have to document procedures for planning, implementing, and maintaining statistical techniques, if statistical process control is used for in-process or final inspection of the product or part.

21.158 Inspection, measuring, and test equipment control

Proposed new § 21.158 would require an applicant to establish and each holder to maintain procedures to control and maintain the accuracy and precision of inspection, measuring, and test equipment used in determining conformity to the approved design. Such equipment would have to be calibrated, controlled, and serviced before use in determining conformity of products and parts to the approved design. The calibration accuracy would have to be appropriate for its intended measurement and traceable to the National Institute of Standards and Technology, or other standards acceptable to the Administrator. While the proposed language would be new to part 21, it is based on existing production certification advisory material and is similar to requirements currently applicable to repair stations.

21.159 Inspection and test status

Proposed new § 21.159 would require the applicant to establish and each holder to maintain procedures for the identification of process, final inspection, and test status of materials, products, and parts supplied, manufactured, and assembled to the approved design.

21.160 Nonconforming products, parts, materials, and services control Proposed § 21.160 would be mostly a new requirement that deals with the need for an applicant to establish and each holder to maintain procedures to prevent the use of products or parts that do not conform to the approved design. This proposed requirement is the equivalent function of present §§ 21.143(a)(4) and 21.303(h)(8), which reference a materials review board system of procedures for recording board decisions and disposing of rejected parts. Thus, the current regulation assumes that there would be a procedure for identifying products that should be rejected.

21.161 Corrective and preventive action

Proposed new § 21.161 would require the applicant to establish and each holder to maintain procedures for implementing a corrective and preventive action system to eliminate or minimize the causes of actual or potential nonconformities and would result in corrective measures to preclude recurrence. The

use of metrics to track the effectiveness of the corrective action should be part of this system.

21.162 Handling, storage, packaging, preservation, and delivery

Proposed new § 21.162, which is partially based on present § 21.303(h)(5), would require the applicant to establish and each holder to maintain procedures for the control and protection of work in progress and for materials, products, and parts in storage or transit.

21.163 Control of quality records

Proposed new § 21.163 would require the applicant to establish and each holder to maintain procedures for identification and retrieval of acceptance and test records specified in proposed § 21.141(g) that demonstrate the product's conformance to the approved design. This proposed requirement would impose current record requirements of subparts K and O on all PAH's (§§ 21.303(h)(9) and 21.613). This proposal would help the FAA to monitor compliance of all production approval holders.

21.164 Internal quality audits

Proposed new § 21.164 would require an applicant to establish and each holder to maintain procedures for planning and conducting internal quality audits for the purpose of

assuring compliance with the approved quality system. This proposed requirement is consistent with existing ISO requirements and, as a harmonization effort, would facilitate international approval of United States approved production systems.

21.165 Final release of product or part

Proposed new § 21.165 would require an applicant to establish and each holder to maintain procedures for issuing an airworthiness approval for each shipment of products or parts, as required by § 21.143(h), and in compliance with Subpart L. The procedures should contain a means of verification that, prior to shipment, the product(s) or part(s) conform to the FAA approved design, and is in condition for safe operation. This may be done by verifying that the product(s) or part(s) have been approved and remained under the control of the approved quality system, have not been exposed to handling damage, and have not exceeded any shelf life limits. The airworthiness approvals may only be issued by personnel authorized under these procedures.

Subpart K - Parts Design Approval

Proposed subpart K would contain the provisions of present subpart K that relate to obtaining what would be called a parts design approval (PDA). The PDA would be a separate and stand

alone design approval. As previously discussed, the parts production approval requirements have been included in subpart G. Organizational and substantive changes are proposed in the following areas:

1. Proposed § 21.301(a) is based on present § 21.301. Proposed § 21.301(b) and (c) are based on present § 21.303(a). Proposed § 21.301(d) is new language that is intended to make it clear that when an applicant obtains a parts design approval, that approval includes the approval of all parts within that design.

2. Proposed § 21.303 introductory text and paragraphs (a) and (b) are based on portions of present § 21.303(c).

A minor change from current § 21.303(c) in proposed § 21.303 would be omission of the specific office to which an application is submitted. While applications would continue to be submitted to the appropriate local FAA office in the geographic area in which the manufacturing facility is located, this omission means that a regulation change would not be necessary each time the FAA reorganizes.

3. Proposed § 21.303(c), which is based on the present § 21.303(c)(4), has deleted the specific language regarding "Identicality" from the rule. ~~The~~**Nevertheless, the** methodology of "Identicality" ~~has been incorporated into the~~**may, under** ~~general requirements~~**appropriate circumstances, be utilized** for

showing compliance, i.e.: "Test reports and computations, *using a comparative or general analysis*, as necessary to show...." The need for this proposed change has been created by the growth of the replacement part market segment. The significant growth of this activity has resulted in more PMA applications on more parts involving sophisticated designs and state-of-the-art technology. In these types of parts, a showing of identical design may not in-and-of-itself be sufficient to assure that parts will meet the airworthiness requirements. The broader term "comparative analysis" is proposed to provide a means for an applicant to compare his design to an already FAA approved design. The applicant can be issued a PDA based solely on a design comparison if the applicant can substantiate that the nature of the **part, taking** ~~part~~**into account its criticality and complexity**, does not warrant any further showing.

The applicant may show by comparative analysis that the part is equal to or better in functional design than the design of the type certificated or PDA part that would be replaced. The applicant would thoroughly analyze the type certificated part and compare it with the proposed PDA part, report all differences and provide sound technical justification for these differences. If testing is required, a new (zero time since new) part from the TC holder tested under the same procedures and conditions as the applicant's part would be used as a test standard.

The applicant may demonstrate by general analysis that the functional design of the part otherwise meets the requirements of all applicable airworthiness standards. This analysis should discuss how the part meets each of the Federal Aviation Regulations or specific TSO functional requirements and address material composition and condition, fabrication, configuration, and interface with other parts. Functional testing as necessary would be related to the criticality and complexity of the part.

As stated, identicality would still be a viable methodology for showing the design meets the airworthiness requirements as long as the applicant and the FAA exercise the proper considerations. The applicant would substantiate the identicality methodology by providing the FAA with necessary data based on the complexity and criticality of the part. Identicality would also be used in conjunction with other methods to show the design meets the airworthiness requirements. For instance, identicality could be combined with a test reports and computation method where testing may or may not be required depending on the criticality and complexity of the part.

Aircraft that no longer have an active design approval holder or production approval holder from which data can be obtained to support the manufacture of parts need consideration in order to continue flying. These aircraft are primarily and almost exclusively involved with personal or sport flying and are

not being used for carriage of passengers for hire. In these instances where data is not available or where the needed part is not critical to safety, more consideration should be given to the use of identicality, or a "form, fit, and function" analysis.

4. Proposed § 21.303(d) uses the broader term "written authorization" but would contain the provisions of the present § 21.303(c)(4) that require the applicant to include a copy of the written evidence to use another party's approval.

A written authorization is to identify the existing approved data as being that design data in the type certificated product or TSO article of the writer of the authorization and that the data is in the possession of the applicant for the PDA. When the PDA is issued to the applicant, the applicant becomes the holder of a design approval and can exercise all the privileges of such a holder including passing the total or a part of the design to another through a transfer under § 21.307 or an authorization for another applicant to seek a new PDA. Each PDA holder is responsible for their own approved design when the PDA is granted by the FAA and carries the responsibility of a PDA holder for the products they manufacture or cause to be manufactured. A transfer is to be distinguished from a written authorization to seek a PDA. The transfer of an approved design is simply a transfer of ownership of the design and does not require FAA approval. The new owner, however, may not make changes to the

design without FAA approval as is always the case for design changes. A written authorization for an applicant to seek a PDA is to establish a new design approval equal to the first unless specifically restricted by the written authorization and agreed to by the Administrator.

5. Proposed new § 21.303(e) provides continued airworthiness requirements for a Parts Design Approval. This requirement has been a practice under PMA, but was never delineated in the FAR's. The proposed rule is intended to implement the guidance provided in FAA Order 8110.42, dated August 4, 1995. Part 21, § 21.50(b) states that a holder of a design approval, including either the type certificate or supplemented type certificate for an aircraft, aircraft engine, or propeller for which application was made after January 28, 1981, shall furnish at least one set of complete instructions for continued airworthiness (IFCA), etc. If the part for which PDA is sought would be eligible for installation on a product for which application was made after that date, the PDA applicant must furnish data sufficient for the FAA to determine that the IFCA will continue to be valid for the product with the part installed. In this regard, the applicant will need to furnish supplementary IFCA if installation of the part results in changes to the validity of the IFCA. For parts which would be eligible for installation only on a product for which the application for

TC was made on or before January 28, 1981, the PDA applicant must furnish maintenance and related instructions, if the TC or STC holder's instructions are not adequate.

6. Proposed § 21.305, which would address issuance of a parts design approval, is based on present § 21.303(d)(1). In addition to tests and inspections, the Administrator may require a demonstration that a replacement part meets the performance characteristics of the original part in those instances where performance is deemed necessary in the showing of airworthiness for that part.

7. Proposed § 21.307 would allow a parts design approval to be transferable or made available for use by another company through a written agreement. The present § 21.303(i) prohibits the transfer of a PMA. The basis for this change is that since design approval would be separated from production approval, design approval could be transferred. Because production approval is specific to a company and its facility, it is not transferable and thus when design approval and production approval are combined they cannot be transferred.

8. Proposed new § 21.309, which is partially based on present § 21.303(i), would provide for the duration of a parts design approval and also cover the automatic conversion of design approval aspects of existing PMA's to parts design approvals.

9. Proposed § 21.311 would propose to change PDA designs in a manner similar to the procedure for the current TSOA's.

Subpart L - Airworthiness Approvals

The current subpart L is for Export Airworthiness Approvals. It specifies the procedures to be followed when U.S. produced products and parts are exported. Export Airworthiness Certificates (FAA Form 8130-4) are issued for aircraft, aircraft engines, and propellers to be exported and Airworthiness Approval Tags (FAA Form 8130-3) are issued for components, parts, materials, articles, and TSO items to be exported. These approvals are issued by FAA aviation safety inspectors or their designees (i.e., Designated Airworthiness Representatives, Organizational Designated Airworthiness Representatives, and Designated Manufacturing Inspection Representatives). Although there are no current regulations governing issuance of domestic Airworthiness Approval Tags (FAA Form 8130-3) for parts and products other than aircraft, there has been a growing demand within the U.S. aviation industry to require FAA airworthiness tags for domestic shipments in order to better identify and track aviation products.

This proposed revision would reflect current industry practice in the regulation for all airworthiness approvals - exports and domestic. For example, the revision would provide a

regulatory basis for issuance of airworthiness approvals for products other than aircraft and parts shipped within the U.S., and recognize the existence of satellite parts stores located outside the U.S., but which are an extension of the production approval holder's quality system.

This proposed revision would also initiate a fundamental change in the manner in which airworthiness approvals are issued for parts and products other than aircraft. Under the proposed regulation, the FAA would no longer be responsible for the issuance of these airworthiness approvals. Instead, it would be the responsibility of the PAH to issue original airworthiness approvals for new parts and products other than aircraft (see § 21.141(h)). In addition, for exports it would be the responsibility of the importer and exporter, rather than the FAA, to assure that the requirements of the importing country are met.

The title of subpart L would be changed from "Export Airworthiness Approvals" to "Airworthiness Approvals" because the proposed revision of subpart L would provide regulations for all airworthiness approvals, both export and domestic. However, the issuance of airworthiness certificates for aircraft to be used within the U.S. is regulated under the procedures of subparts H and I of part 21. That process is not being changed or affected by this NPRM.

The current definitions of Class I, Class II, and Class III products in § 21.321 are not included in the proposed revision. This distinction between types of products and parts is no longer necessary because the proposed regulation would provide for equal documentation of airworthiness for all parts. Also, in § 21.321, references to "newly overhauled" would be removed. This information would be placed in an order or other advisory material as necessary. Further, as a result of changes to the FAA Form 8130-3, which now allow use of that document for return-to-service of products maintained under part 43, and recent FAA/JAA harmonization efforts, many countries would accept an FAA Form 8130-3 completed after maintenance as a valid airworthiness document, and would not require a separate form for export.

In the proposed revision of subpart L, form names and numbers and detailed application requirements would be taken out of the regulation, referring instead to "in a form, manner, and location as prescribed by the Administrator." This information would be placed in FAA Order and Advisory Circular material, to give the FAA flexibility to make changes more easily, when necessary (e.g., harmonization of airworthiness form names with foreign air agencies, ability to respond to changes in technology for electronic documentation, etc.).

Proposed § 21.323(a), which is based on present §§ 21.329 and 21.331(a) and also includes new language, would provide

requirements the product has to meet to be eligible for an airworthiness approval. Under proposed § 21.323(b), which is based on present § 21.325(c) and also includes new language, the limited airworthiness approval has been added as a means to document the status of a product that does not meet all the requirements for a regular airworthiness approval. The exception from requirements resulting in the limited airworthiness approval (i.e., what requirement has not been met) should be specified on the document. A product with a limited airworthiness approval may be considered airworthy only after the specified exception is either corrected by an approved source or the design with the exception is approved by the FAA (or importing civil aviation authority). For example, if an engine is shipped without a component specified on the TC data sheet, the airworthiness approval document accompanying the engine would specify this discrepancy to the type design. The engine would not be considered airworthy until that component is installed on the engine by an approved source. Since there would be this "exception" listed on the airworthiness approval document, it would be considered a "limited" airworthiness approval. Of course, in order for such an engine to be data plated before shipment, the engine must have been fully tested and accepted with the component installed.

In proposed § 21.323, references to Class I, II, and II products are removed as discussed above.

Under current § 21.323 production approval holders must have employees who are representatives of the Administrator (DMIR or ODAR) issue airworthiness forms. This requirement has been removed from proposed § 21.323 because proposed § 21.139(a)(2) would allow production approval holders to issue these forms under the PAH Quality Assurance System, without representatives of the Administrator for products and parts other than aircraft. The qualified personnel authorized under this system would not need to be employees of the PAH (e.g., supplier, distributors). This change would provide flexibility within the PAH system while relieving the FAA from administrating the designee system at PAH's who issue approvals other than airworthiness certificates.

Current § 21.325 has been renamed in the proposal as "Kinds of approvals" because this is the title from the current paragraph (a), which is the only portion of this section that has been included in the proposal. Information in current paragraph (b) on "Products which may be approved" would be provided in order and advisory material, as appropriate. The requirement that parts be "manufactured and located in the United States" in current § 21.325(b)(3) would be eliminated for FAA production approval holders since they currently may make an airworthiness determination anywhere in the world as controlled by the approved

production system. Dropping this requirement would allow a PAH to document that determination, even if the determination was made outside the United States. To ensure that the proper level of safety is maintained, the PAH would have to establish and maintain a system that ensures that manufacturing, quality control, and inspection processes, for it as well as any suppliers, works as well outside of the United States as within. A system that ensures that the manufacturer has adequate control in each of these areas throughout the world is sometimes referred to as a "closed system."

Also, form names and numbers were removed from this section, referring instead to "in a form, manner, and location prescribed by the Administrator," as discussed above.

For products other than aircraft or parts, proposed § 21.325(c) only refers to airworthiness approvals, making no distinction between export airworthiness approvals and domestic airworthiness approvals, and stating that these approvals are documented in a form, manner, and location prescribed by the Administrator. It is intended that the details of airworthiness approval documentation would be specified in Directive and Advisory material. This was done to allow flexibility in the airworthiness approval documentation process in order to be responsive to harmonization efforts with foreign authorities and provide for future changes in technology which may lead to a

"paperless" airworthiness approval documentation system. Proposed § 21.325(c) is based on present §§ 21.325(c) and (a)(2), and also includes new language.

A review of Advisory Circular 21-2H, which specifies the special requirements of importing countries, show that for parts, countries either require an FAA Form 8130-3 or require a document issued in accordance with part 21, subpart L. There are no special requirements on the parts themselves, only on the documentation of the parts. Therefore, in most instances the issuance of an FAA Form 8130-3 documenting the airworthiness approval of a part (without necessarily specifying the fact that this was a domestic shipment or export) would be sufficient without a change to the bilateral airworthiness agreements. Further, an effort is underway between European and U.S. manufacturers and the FAA, JAA and Transport Canada, to develop a common form which would be accepted as an airworthiness approval by all parties. If this effort is successful, and is adopted by other aviation authorities, the need for distinction between domestic and export airworthiness approval would be eliminated.

The language of current § 21.327, Application, was simplified in this proposal because the details provided in the current regulation are too specific, do not cater to current practices and may not be appropriate for future practices. These

details are better placed in order and advisory material, which would be modified accordingly.

The current requirements in §§ 21.329, 21.331, and 21.333 on issue of export airworthiness approvals for Class I, II, and III have been simplified and combined into proposed § 21.329, Issue of airworthiness approvals, because the details are better placed in order and advisory material, which would be modified accordingly. Also, some requirements common to all paragraphs are considered "eligibility" requirements and have been placed in proposed § 21.323.

Proposed new § 21.329(d) would specify under what conditions an airworthiness approval form may be used under part 43 for return-to-service. This is consistent with information currently in FAA Order 8130.21A, Procedures for Completion and Use of FAA Form 8130-3 Airworthiness Approval Tag.

Under this proposal, present § 21.335 would be renumbered as § 21.331 and simplified because the details provided in the current regulation are too specific, do not cater to current practices and may not be appropriate for future practices. These details are better placed in order and advisory material, which would be modified accordingly.

Current § 21.337, Performance of inspection and overhauls, and § 21.339, Special export airworthiness approval for aircraft, would be removed for the same reason.

A new § 21.333, Airworthiness approval of products or parts prior to issuance of a design approval, would be added to specify requirements for the issuance of airworthiness approvals under proposed § 21.139(c) for applicable products or parts by a production certificate holder prior to issuance of the pending type certificate. The airworthiness approval could not be issued unless the production certificate holder has an acceptable means of recalling any products or parts that are not approved as part of the subsequent type certificate approval. This authorization would be limited to only production certificate holders and is based on the need for pre-positioning of parts at customers' facilities prior to type certification or other design approval (e.g., engineering change).

Subpart N - Approval of Engines, Propellers, Materials, Parts, and Appliances: Import

In 1998 the FAA, JAA, Transport Canada, and the Production Certification Working Group met to harmonize the use of the Form 8130-3 Airworthiness Approval Tag with the JAA Form 1 and Transport Canada Form 24-0078. As a result of this effort, the FAA proposes changes to §§ 21.500 and 21.502 to allow the use of an airworthiness approval authorized by the country of manufacture.

Subpart O - Parts Design Approval for Technical Standard Order Articles

The present subpart O contains provisions for issuance of a design approval for both United States and foreign manufactured TSO articles. Proposed subpart O would contain the provisions of present subpart O that relate to the issuance of a letter of TSO design approval for foreign designed TSO articles. As discussed previously, the proposed subpart O would, for U.S. designed/manufactured TSO articles, separate the design and production approval aspects. The present design approval aspects of the TSOA are proposed to be replaced with a parts design approval for an article of TSO compliance. As previously discussed, the production approval requirements have been proposed for subpart G.

The TSO marking requirements of the present subpart O have been removed and placed in the proposed part 45. The present subpart O contains a reference to the part 45 marking requirements for foreign manufactured TSO articles, while subpart G contains the reference to the part 45 marking requirements for a U.S. manufactured TSO article produced under a U.S. production approval.

The proposed subpart O would replace the term "authorization" with the term "approval". This change would more clearly link the action of issuing an approval as an action

performed by the Administrator. This change is in-line with the definition of "approved" contained in part 1. Also, the change provides more uniformity with other design, and production approvals issued under part 21.

Organizational and minor changes that would be included to format this subpart more in line with subpart B are proposed in the following areas:

1. Proposed § 21.601, Applicability, is based on present § 21.601 without those provisions that relate to production approval.

2. Present § 21.603, TSO marking and privileges, would be deleted since paragraph (a) relates to general marking requirements that would be covered in part 45 and paragraphs (b) and (c) no longer apply. Specific marking requirements may be included in an individual TSO. Depending on the article or component part, these requirements vary widely, particularly in the case of articles that employ software.

3. Proposed § 21.603, Application for parts design approval for TSO articles, is based on present § 21.605 without the provisions that relate to the FAA issuing the TSOA and the provisions that relate to the production approval. The present § 21.605(c), (d), and (e) requirements relating to issuing a TSOA would be covered in proposed § 21.607. Proposed § 21.603(a) would omit the office (currently specified in § 21.605(a)) to

which an application is submitted. While applications would continue to be submitted to the appropriate cognizant, responsible or geographic office, this omission would mean that a regulation change would not be necessary each time the FAA reorganizes.

4. Proposed § 21.605, Approval for deviation, is based on present § 21.609 but the reference to submitting data to a specific FAA office would be omitted. The rationale for this omission has been previously discussed.

5. Present § 21.607 which covers rules governing TSOA holders as it relates to production and marking of articles would be deleted. As previously discussed production approval aspects would be covered under subpart G and the marking requirements would be covered under part 45.

6. Proposed § 21.607, Issue or denial of TSO parts design approval, is based on present § 21.605(c), (d), and (e) without the provisions relating to the production approval and marking.

The time limit referenced in proposed § 21.607(c) is carried over from present § 21.605(e). This requirement allows for planning and scheduling of applications for design and production approval as well as type certification of original installation. This aspect is invaluable in the completion of most certifications and therefore remains an integral segment of this part.

7. Present § 21.609, Approval for deviations, would be covered in proposed § 21.605.

8. Proposed § 21.609, Design changes, is based on present § 21.611(a) and (b) with minor editorial changes. The FAA proposes to remove the language regarding changes by persons other than the manufacturer (present § 21.611(c)). This material is deemed to be inappropriate for part 21, but appropriate for part 43. The alteration authorization process remains in part 43 as noted. This pertains to maintenance activity, but is not applicable to design or production approvals and therefore would be removed from this section of part 21. Major design changes by a manufacturer (other than a holder of a design approval for that TSO article) could be accomplished under existing STC procedures or under the proposed PDA procedures.

9. Proposed § 21.611, Issue of parts design approval for TSO articles: import articles, is based on present § 21.617 with only minor editorial changes, except that design approval does not include manufacturing approval. Manufacturing requires a separate production approval or an approved supplier quality system.

10. **Present** § 21.613, Recordkeeping requirements, would be deleted, **since** it contains provisions related to production which, as previously discussed, would be covered in subpart G.

11. Proposed § 21.613, Inspection and test, is based on the present § 21.615 that allows the FAA to conduct any inspections or tests but focuses these inspections and tests on those associated with the design approval process in subpart O.

12. Present § 21.615, FAA inspection, would be deleted, since it contains provisions related to production approval which, as previously discussed, are covered in subpart G. However, those FAA inspections and tests that relate to the design approval process would be covered in the proposed § 21.613.

13. Proposed § 21.615(a) would allow a parts design approval for TSO articles to be transferable, while the present § 21.621 prohibits the transfer of a TSO design approval. The basis for this change is that, since design approval would be separated from production approval, design approval could be transferred. Because production approval is specific to a company and its facility, it is not transferable. The task of this ARAC revision of part 21 was to level the playing field as it pertains to all types of approvals in the production process. The transfer of "parts design approval" has been included in the new part 21 to create the identical policy for the TSO design area, as already exists in the area of type certificates and parts design approvals.

The same paragraph as in the Type Certificates and Parts Design Approvals was placed in the Technical Standard Order parts design approval section. This addition is possible at this time due to the separation of design approval from production approval for TSO articles. Previously they were tied to the same approval which encompassed design and production.

This also allows the design approval to become more marketable as a stand alone data package. However, the production approval remains intact with the production approval holder which has been authorized under a separate approval process.

Proposed § 21.615(b) is based on present § 21.621 and proposed § 21.615(c) contains new language. These proposed sections would cover the automatic conversion of design approval aspects of existing TSOA's to parts design approvals of TSO articles.

14. Present § 21.617, Issue of letters of TSO design approval: import articles, would be deleted since it would be covered in proposed §§ 21.135, 21.611, and 45.17.

15. Present § 21.619, Noncompliance, would be deleted since it is not needed. The Administrator, under the proposed § 21.615 as well as under the present § 21.621, has the authority to withdraw or otherwise terminate a parts design approval for misuse or at the discretion of the Administrator.

16. Present § 21.621, Transferability and duration, would be deleted since it would be covered in the proposed § 21.615.

Part 45 - Identification and Registration Marking

The continued validity of an airworthiness certificate issued under part 21 rests on conformity to the approved design. Proper identification of products and parts is therefore key to determining the airworthiness status of an aircraft. Traceability and the ability to determine the airworthiness status of a part or product are of concern to the aviation industry, due to the increasing traffic in counterfeit and unapproved parts and the exploding international market in aviation parts. Furthermore, a person who receives a product or part needs to know the conformity and other status of the product or part.

The current marking regulations were developed in a somewhat piecemeal fashion in tandem with the associated production approval regulations. As a result, both parts 21 and 45 contain marking requirements for new products and parts. Marking requirements for products produced under a type certificate or production certificate and PMA parts are in part 45, while TSO authorization marking requirements are scattered among the procedural requirements in part 21.

To assist manufacturers and maintenance personnel subject to the identification marking requirements of part 45 new guidance material has been developed that lists additional marking requirements found elsewhere in title 14. It lists the additional marking requirements that relate to specific certification standards that appear in parts 23, 25, 27, 29, and 33 and in SFAR 23, as well as additional marking requirements that relate to specific operations that appear in parts 91, 121, 125, 133, and 135. AC 45-XX is available on-line at http://www.faa.gov/abc/ac-chklst or by mail from U.S. Department of Transportation, TASC, Subsequent Distribution Section, SVC-121.23, 3341 Q 75th Avenue, Landover, MD 20785.

The regulations do not currently require parts produced under a type certificate or a production certificate to be individually marked, although most production certificate holders do so for their own quality assurance and traceability purposes. The lack of marking requirements down to the part or component level has sometimes hindered field identification when parts must be replaced, serviced, or removed from service, and during accident investigations.

Other omissions in the current marking requirements concern parts produced by the owner or operator of an aircraft, as well as parts that are installed and approved in connection with one-time approvals, such as STC's and field approvals. The proposed

regulations would consolidate and extend marking requirements to all such parts.

Therefore, the FAA proposes a complete revision of subparts A and B of part 45, Identification and Registration Marking, to consolidate in part 45, to the extent practicable, all product marking requirements and to add additional marking requirements that would facilitate the traceability of parts. Subpart C of part 45 would not be changed.

Section 45.1 - Applicability

Present § 45.1 covers identification of aircraft, aircraft engines, and propellers, and certain replacement and modified parts, namely those produced under a PMA. As proposed, § 45.1 would cover all products and parts manufactured under a production approval and also owner or operator produced parts that would be manufactured under the provisions of § 21.131(d)(2), and parts for which there is a replacement time, inspection interval, or other procedure related to the criticality of the part.

Section 45.3 - Identification Responsibilities and Restrictions

Proposed new § 45.3 would include the following:

1. Products and parts and owner/operator produced parts must be identified.

2. Only production approval holders or owner/operators or their designated representatives are allowed to apply required marking.

3. Markings on parts that are subjected to a major alteration must be modified to reflect that alteration.

4. Conditions under which persons performing maintenance are allowed to remove, change, or place identification markings or remove and replace identification plates.

5. A prohibition against the removal, changing, or placing of identification information unless as part of maintenance.

This proposal would provide uniform marking requirements for all modification and replacement parts sold as spares to assure that all individuals can readily determine whether a part is eligible for installation on a product for which a type certificate has been issued.

Section 45.5 - Identification requirements

Proposed § 45.5 would cover the identification data now contained in § 45.13(a). However, the requirement would apply to all parts, not just PMA produced parts, as is the case under present § 45.15. The requirements in current § 45.15 to mark PMA parts with "FAA-PMA" and to show installation eligibility would be deleted because many parts have multiple installation eligibilities. Eligibility information is available in other

required documents. Proposed § 45.5 contains the basic marking requirements across the board; specific marking requirements for certain types of products are contained in subsequent sections. Proposed § 45.5(b) states that "detail parts whose markings become obliterated during normal manufacturing processes need not be remarked." The "manufacturing processes" referred to in paragraph (b) refers to those involved in the completion of the top assembly, not the manufacture of the piece part. For example, if, during the assembly of the wing on a Cessna 172, the markings are obliterated on a rib brace, it would not have to be remarked. However, if a like item were to be sold as a replacement part, the marking would have to be intact since the marking of the part is a final acceptance requirement of the "manufacturing process" for that single item.

Section 45.11 - Type Certificated Products

Proposed § 45.11 contains detailed marking requirements that are mostly based on present § 45.11, but with some reorganization. The current § 45.11(a) requires that aircraft covered under § 21.182 must be identified by means of a fireproof identification plate that is secured to the aircraft fuselage.

Current § 45.11(a) contains two exceptions, manned free balloons and aircraft manufactured before March 7, 1988. This proposed change would include as exceptions aircraft: (1)

manufactured for operation under part 121 or 127, (2) in commuter air carrier operation (as defined in part 119 of this chapter) and (3) manufactured for export. The proposal provides definitions for the three exceptions.

The FAA recognizes that the rationale for the requirement that identification plates be attached to the aircraft fuselage exterior and visible to persons on the ground was an effort to enhance the effectiveness of drug interdiction activities of the U.S. Government.

The FAA has determined that aircraft operations of the types contained in the proposed new exceptions are unlikely to be connected with drug smuggling activities. Consequently, compliance with the identification plate location rule by manufacturers of aircraft for use in these operations would not significantly enhance the effectiveness of the narcotic interdiction operations. The requirement in current § 45.11(b) that propellers and propeller blades and hubs be identified by means of a fireproof plate or other approved fireproof method has not been included in proposed § 45.11 because the FAA has determined that such plates are not practical for propellers and propeller blades and hubs.

Section 45.13 - Owner or Operator Produced Parts

Proposed new § 45.13 would prescribe the minimum marking requirements for owner or operator produced parts.

Section 45.14 - Identification of Critical Components

Proposed § 45.14 is based on present § 45.14 and contains the marking requirements for parts for which a replacement time, inspection interval, or related procedure has been specified. The original wording in this section made it subject to varying interpretations that could lead to requirements for marking imbedded structural components and other items that have an "inspection interval or related procedure," but are not subject to replacement or even accessible without disassembling other major areas. Such assemblies could have been identified under this section with a literal interpretation of the original wording. Therefore, the wording was modified in an attempt to provide clarification and definition of the intent of this identification and serialization requirement.

Section 45.17 - TSO Parts and TSO Replacement Parts.

Proposed § 45.17 would require that TSO parts and replacement parts be marked the same as other products and parts and must also comply with specific TSO marking requirements as well as have the TSO number on it.

Derivation and Distribution Tables

In this NPRM, the FAA proposes to completely revise subparts G, K, L, and O of part 21 and subparts A and B of part 45. The Derivation Tables below show the current part 21 or part 45 sections on which the proposed sections in those subparts are based. The Distribution Tables show which proposed sections would replace the current sections.

DERIVATION TABLE FOR PART 21
SUBPARTS G, K, L, AND O

New Section - Subpart G	Based on:
21.131(a)	21.131; 21.301; 21.601(a)
21.131(b)	New language
21.131(c)	21.303(a)
21.131(d)(1)-(3)	21.303(b)(2), (b)(4); New language (d)(3)
21.131(e)(1)-(3)	New language
21.133(a)(1)-(3)	21.133(a)(1)-(3), (a)(3); 21.303(d)(2); 21.303(g); 21.601(b)(4); 21.605(a)(3)
21.133(b)	21.133(b); 21.303(c); 21.605(a)
21.135(a)	21.135; 21.303(d)(2); 21.605(c)
21.135(b)	21.147
21.135(c)(1)-(2)	21.123; New language
21.135(d)	21.137; 21.303(g); 21.601(c)
21.135(e)	21.617(a)(1),(c)
21.137 Introductory paragraph	21.151
21.137(a)	New language

21.137(b)	New language
21.139(a)(1)-(2)	21.163(a)(1)-(2); New language
21.139(a)(3)	New language
21.139(b), (c)	21.121-21.130; New language
21.139(d)(1)-(2)	21.163(b)
21.141(a)	21.165(a)
21.141(b)	21.147; 21.303(j)
21.141(c)	21.165(b); 21.303(k); 21.603(a) **[?]**; 21.607
21.141(d)	New language
21.141(e)	New language
21.141(f)	21.607(c); 21.613
21.141(g)	21.303(h)(9); 21.613(a)
21.141(h)	New language
21.141(i)	New language
21.141(j)	New language
21.141(k)	21.607(d)
21.141(l)	21.157; 21.303(e), Introduction; 21.615
21.141(m)	21.161
21.143(a)	21.153
21.143(b)	21.155, 21.303(i), 21.621
21.143(c)	21.159, 21.303(i), 21.621
21.145	21.139, 21.303(h), 21.605(a)(3), 21.607(b)
21.147(a)(1)-(13)	New language
21.147(b)	New language
21.149(a)	New language (based on) current JAR and ISO requirements
21.149(b)	21.143(a)(1)

21.151	21.143(a)(5); 21.303(h)(6); 21.303(h)(7); New language
21.153	New language
21.155(a)-(f)	21.143(a)(2); 21.143(b); 21.303(h)(1) and (h)(2); New language
21.156	21.143(a)(3); 21.303(h)(4); 21.303(h)(5) **[?]** New language
21.157	21.143(a)(3); 21.303(f)
21.158	New language
21.159	New language
21.160	21.143(a)(4); 21.303(h)(8); New language
21.161	New language
21.162	21.303(h)(5); New language
21.163	21.303(h)(9); 21.613; New language **[?]**
21.164	New language

New Section - Subpart K	**Based on:**
21.301(a) 21.301(b) 21.301(c)	21.301 21.303(a) New language
21.303 Introduction 21.303(a) 21.303(b) 21.303(c) 21.303(d)	21.303(c) Introduction 21.303(c)(1) 21.303(c)(3); New language 21.303(c)(4) 21.303(c)(4); New language

21.303(e)	New language
21.305	21.303(d)(1)
21.307	21.303(i); New language
21.309	21.303(i); New language
21.311	**[?]**

New Section - Subpart L	**Based on:**
21.321(a)	21.321(a)(1); New language**[?]**
21.321(b)	21.321(a)(2)
21.323(a)(1)-(4) 21.323(b)	21.329; 21.331(a); New language 21.325(c); New language
21.325(a) 21.325(b) 21.325(c)	New language 21.325(a)(1) 21.325(c); 21.325(a)(2); New language
21.327	21.327
21.329(a) 21.329(b) 21.329(c) 21.329(d)	New language 21.329 21.331; 21.333 New language; Order 8130.21A
21.331	21.335
21.333	New language

New Section - Subpart O	**Based on:**
21.601(a)(1)-(3) 21.601(b)(1)-(3)	21.601(a)(1)-(3) 21.601(b)(1)-(3)

21.603(a)(1)-(2) 21.603(b)	21.605(a)(1)-(2) 21.605(b)
21.605(a) 21.605(b)	21.609(a) 21.609(b)
21.607(a) 21.607(b) 21.607(c)	21.605(c) 21.605(d) 21.605(e)
21.609(a) 21.609(b)	21.611(a) 21.611(b)
21.611(a)(1)-(2) 21.611(b) 21.611(c)	21.617(a)(1)-(2) 21.617(b) 21.617(c)
21.613	21.615
21.615(a) 21.615(b) 21.615(c)	New language 21.621 New language

DERIVATION TABLE FOR PART 45
SUBPARTS A AND B

New Section - Subpart A	**Based on:**
45.1(a)(1) 45.1(a)(2) 45.1(a)(3) 45.1(a)(4) 45.1(b)	45.1(a)(1) 45.1(b) **[?]** 45.14 45.1(c) New language
New Section - Subpart B	
45.3(a) 45.3(b) 45.3(c) 45.3(d) 45.3(e)	45.11(a)-(b) 45.13(b) New language 45.13(d) 45.13(e)

45.5(a)	45.13(a); 45.15(a)(2), a)(3)
45.5(b)	45.15(a) Introduction
45.5(c)	45.15(b)
45.5(d)	New language **[?]**
45.11(a)(1)	45.11(a)
45.11(a)(2)	45.11(c)
45.11(a)(3)	45.11(d)
45.11(a)(4)	45.11(a)
45.11(b)(1)	45.11(a)
45.11(b)(2)	45.13(a)(7)
45.11(b)(3)	New language
45.11(c)	45.11(b)
45.13	New language
45.14	45.14
45.17	21.607(d); 21.617(c)

DISTRIBUTION TABLE FOR PART 21
SUBPARTS G, K, L, AND O

Current Subpart G	**Replaced by:**
21.131	21.131(a)
21.133(a)	21.133(a)
21.133(b)	21.133(b)
21.135	21.135(a)
21.137	21.135(d)
21.139	21.145
21.143(a)(1)	21.149(b)
21.143(a)(2)	21.155
21.143(a)(3)	21.156; 21.157
21.143(a)(4)	21.160
21.143(a)(5)	21.151
21.143(a)(6)	Deleted
21.143(b)	21.155

21.147	21.141(b)
21.149	21.135(b)
21.151	21.137, Introduction
21.153	21.143(a)
21.155	21.143(b)
21.157	21.141(l)
21.159	21.143(c)
21.161	21.141(m) **[?]**
21.163(a)(1)-(2) 21.163(b)(1)-(2)	21.139(a)(1)-(2) 21.139(d)(1)-(2)
21.165(a) 21.165(b)	21.141(a) 21.141(c)

Current Subpart K	**Replaced by:**
21.301	21.131(a); 21.301(a)
21.303(a)	21.131(c); 21.301(b)
21.303(b)(1), (3)	Deleted
21.303(b)(2), (4)	21.131(d)(1)-(2)
21.303 Intro.	21.303 Intro.
21.303(c)(1)	21.303(a)
21.303(c)(2)	Deleted
21.303(c)(3)	21.303(b)(1) and (b)(2)
21.303(c)(4)	21.303(c) and (d)
21.303(d)(1)	21.305
21.303(d)(2)	21.135(a)
21.303(e) Intro.	21.141(1)
21.303(e)(1)	Deleted
21.303(e)(2)	Deleted
21.303(f)	21.157
21.303(g)	21.135(d)
21.303(h) Intro.	21.145
21.303(h)(1)	21.155(e)
21.303(h)(2)	21.155(e)
21.303(h)(3)	21.162
21.303(h)(4)	21.156
21.303(h)(5)	21.162 **[?]**; 21.156 **[?]**
21.303(h)(6)	21.151 **[?]**
21.303(h)(7)	21.151 **[?]**
21.303(h)(8)	21.160
21.303(h)(9)	21.163; 21.141 **[?]**
21.303(i)	21.307; 21.309; 21.143
21.303(j)	21.141(b)
21.303(k)	21.141(c)
21.305(a)-(d)	Deleted

Current Subpart L	**Replaced by:**
21.321(a)(1)-(2)	21.321(a)
21.321(b)(1)-(4)	Deleted
21.323(a), (b)	Deleted **[?]**
21.325(a)(1)	21.325(b)
21.325(a)(2)	21.325(c)
21.325(b)(1)-(3)	Deleted?
21.325(c)	21.323(b) **[?]**

21.327	21.327; Advisory material
21.329 Intro. 21.329(a) 21.329(b) 21.329(c) 21.329(d) 21.329(e) 21.329(f) 21.329(g)	21.329(b) 21.329(b) Deleted Deleted Deleted Deleted 21.331 21.331
21.331	21.329(c); 21.323
21.333	21.329(c); 21.323
21.335	21.331; Advisory material
21.337	21.329(d) [?]
21.339	Deleted

Current Subpart O	**Replaced by:**
21.601(a)(1)-(3) 21.601(b)(1)-(3) 21.601(b)(4) 21.601(b)(5) 21.601(c)	21.601(a)(1)-(3); 21.131(a) 21.601(b)(1)-(3) 21.131(b)(4) 21.131(e)(1) 21.135(d)
21.603(a) 21.603(b) 21.603(c)	45.3(b) 21.131(b); 21.615(c) Deleted
21.605(a)(1)-(2) 21.605(a)(3) 21.605(b) 21.605(c) 21.605(d) 21.605(e)	21.603(a)(1)-(2) 21.133(a)(3); 21.145 21.603(b) 21.607(a) 21.607(b) 21.607(c)
21.607(a) 21.607(b) 21.607(c) 21.607(d)	21.141(c) 21.141(a) & (c) 21.141(f) 21.141(k)
21.609(a) 21.609(b)	21.605(a) 21.605(b)

21.611(a)	21.609(a)
21.611(b)	21.609(b)
21.611(c)	Deleted
21.613(a)(1)	21.163; 21.141(g)
21.613(a)(2)	21.141(f)
21.613(b)	21.163
21.615	21.613; 21.141(l)
21.617(a)(1)-(2)	21.611(a)(1)-(2); 21.135(e)
21.617(b)	21.611(b)
21.617(c)	21.611(c); 45.17
21.619	21.143(c)
21.621	21.615(a) and (b); 21.143

DISTRIBUTION TABLE FOR PART 45
SUBPARTS A AND B

Current Subpart A	**Replaced by:**
45.1(a)	45.1(a)(1)
45.1(b)	45.1(a)(2) **[?]**
45.1(c)	45.1(a)(4)
Current Subpart B	
45.11(a)	45.3(a), 45.11(a)(1), (a)(4), b)(1) & (b)(4)
45.11(b)	45.3(a), 45.11(c)
45.11(c)	45.11(a)(2)
45.11(d)	45.11(a)(3)
45.13(a)	45.5(a)
45.13(b)	45.3(b)
45.13(c)	Deleted **[?]**
45.13(d)(1)	45.3(d)(1)
45.13(d)(2)	45.3(d)(2)
45.13(e)	45.3(e)
45.14	45.1(a)(3); 45.14
45.15(a) Introduction	45.5(b)

45.15(a)(1)	Deleted
45.15(a)(2)	45.5(a)(1)
45.15(a)(3)	45.5(a)(2)
45.15(a)(4)	Deleted
45.15(b)	45.5(c)

Regulatory Evaluation Summary

Costs

Benefits

International Trade Impact

Initial Regulatory Flexibility Determination

Federalism Implications

The proposed regulations would not have substantial direct effects on the states, on the relationship between national government and the states, or on the distribution of power and responsibilities among various levels of government. Thus, in accordance with Executive Order 12612, it is determined that such a regulation would not have federalism implications warranting the preparation of a Federalism Assessment.

Paperwork Reduction Act

The reporting and recordkeeping requirements associated with this proposed rule have previously **[?]** been approved by the Office of Management and Budget under the provisions of the

Paperwork Reduction Act of 1980 (Pub. L. 96-511) and have been assigned OMB Control Number 2120-XXXX.

List of Subjects

14 CFR Part 1

Aircraft.

14 CFR Part 21

Air transportation, Aircraft, Aviation safety, Safety.

14 CFR Part 45

Air safety, Air transportation, Airplanes, Aviation safety, Safety, Transportation.

THE PROPOSED AMENDMENT

In consideration of the foregoing, the Federal Aviation Administration proposes to amend the Federal Aviation Regulations (14 CFR parts 1, 21, and 45) as follows:

PART 1 -- DEFINITIONS AND ABBREVIATIONS

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

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

?. Section 1.1 is amended by adding the definition "Commercial part" after "Commercial operator"; and "Standard part" after "Standard atmosphere" to read as follows:

§ 1.1 General definitions.

* * * * *

Commercial part means a~~detail~~ part~~or subcomponent~~ included in the type design that is designated by the design approval holder based on the following criteria:

(1) The part is not necessarily designed or produced for applications in commercial aviation; and

(2) The part is manufactured to a specification or catalog description and marked under the identification scheme of the manufacturer.

* * * * *

Standard part means a part manufactured in conformance with one of the following:

(1) A specification established by a government agency or consensus standards organization acceptable to the Administrator that -

(i) Contains design, manufacturing, test and acceptance criteria, and uniform marking requirements.

(ii) Is made available so that anyone may manufacture that part.

(2) A specification established and designated by a FAA design approval holder that is included in the type design and meets the following criteria:

(i) The specification contains design, manufacturing, test and acceptance criteria, and uniform marking requirements;

(ii) The specification is available to any person so that anyone may manufacture the part; and

(iii) The part is not subject to special quality assurance oversight.

(3) A specification that the Administrator finds will result in a part that can be conformed (airworthiness established) solely on the basis of meeting performance criteria and uniform marking requirements.

(4) A specification for an electrical or electronic part produced in conformance with a specification published and maintained by a consensus standards organization, a government agency or a holder of a design approval; or in conformance with the manufacturer's internal specifications or standards. The internal specifications or standards must include manufacturing controls, quality and reliability test methods, and identification requirements; they may include acceptance test criteria. With the exception of parts manufactured to U.S. Military specifications, designs of which are controlled by the

Defense Supply Center, Columbus (DSCC), the specifications or standards do not include electrical parameters and data which are obtained from the supplier's data sheet. The part is used within the manufacturer's published operating characteristics and environmental ranges.

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. 7252; 49 U.S.C. 106(g), 40105, 40113, 44701-44702, 44707, 44709, 44711, 44713, 44715, 45303.

4. Section 21.1 is revised to read as follows:

§ 21.1 Applicability.

(a) This part prescribes -

(1) Procedural requirements for the issue of type certificates and changes to those certificates; the issue of parts design approvals including design approvals for TSO articles and changes to those approvals; the issue of production approvals and changes to those approvals; the issue of airworthiness certificates; the issue of airworthiness approvals;

the issue of delegation option authorizations and changes to those authorizations; and the issue of designated alteration station authorization and changes to those authorizations.

(2) Requirements governing applicants for and holders of any certificate, approval, or authorization specified in paragraph (a)(1) of this section; and

(3) Procedural requirements for the approval of materials, parts, processes, and articles that require a production approval.

(b) For the purpose of this part, "production approval holder" means a production certificate holder or a parts production approval holder.

(c) For the purpose of this part, "design approval" means type certificate (TC), supplemental type certificate (STC), and parts design approval (PDA). "Standard" parts are excluded from parts design, production certification, and parts production approval requirements, although they may be detail components of an approved design.

(d) For the purpose of this part, "product" means--

(1) **Aircraft;**

(2) **Aircraft engine;**

(3) **Propeller;** and

(4) Any appliance that has been designated by the Administrator as type certificated.

(e) For the purpose of this part, "part" means any item that is not identified as a product, including but not limited to --

(1) Article for which the FAA has issued a Technical Standard Order;

(2) Accessory;

(3) Appliance that has not been designated by the Administrator as type certificated;

(4) Airborne software and firmware; and

(5) Components and parts of a product or part.

5. Section 21.2 is revised to read as follows:

§ 21.2 Falsification of applications, reports, or records.

(a) No person shall make or cause to be made -

(1) Any fraudulent or intentionally false statement or material omission of fact on any application for a certificate or approval under this part;

(2) Any fraudulent or intentionally false entry or material omission of fact in any record or report that is required to be kept, made, or used to show compliance with any requirement for the issuance or the exercise of the privileges of any certificate or approval issued under this part;

(3) Any reproduction for a fraudulent purpose of any certificate or approval issued under this part; or

(4) Any alteration of any certificate or approval issued under this part.

(b) The commission by any person of an act prohibited under paragraph (a) of this section is a basis for denying issuance of, suspending, or revoking any certificate or approval issued under this part and held by that person.

6. Section 21.7 is added to read as follows:

§ 21.7 Compliance disposition.

(a) An application for a certificate or approval under this part may be denied if the Administrator finds, under paragraph (a)(1), (a)(2), or (a)(3) of this section that:

(1) An individual will hold a key management position for the applicant, and that individual --

(i) Exercised control over or held a similar position with a certificate or approval holder whose certificate or approval was or is being revoked; and

(ii) Materially contributed to the circumstances causing the revocation or the revocation process.

(2) An individual will have control over or will have a substantial ownership interest in the applicant, and that individual --

(i) Had a similar control over or a similar interest in a certificate or approval holder whose certificate or approval was or is being revoked; and

(ii) Materially contributed to the circumstances causing the revocation or the revocation process.

(3) An individual will hold a key management position for the applicant, or will have control over or a substantial ownership interest in the applicant, and that individual committed an act of falsification in violation of 18 U.S.C. section 1001, Title 49 of the U.S. Code, or Title 14 of the Code of Federal Regulations.

(b) If a holder employs a new individual in a key management position, or a new individual obtains control over a substantial ownership interest in the holder, the holder must immediately inform the Administrator. If the Administrator finds that the individual is in a position to materially affect the holder's ability to comply with this part, and that the individual has committed an act described in paragraph (a) of this section, the individual may not continue in the position where he or she can materially affect the holder's ability to comply with this part, unless the Administrator approves otherwise. Exercise of the privileges of the certificate or approval after the Administrator makes the findings described in

this paragraph will subject the holder to enforcement proceedings.

(c) For purposes of this section:

(1) "Key management position" includes the positions of each representative and other persons described in § 21.149.

(2) "Certificate or approval was or is being revoked" refers to any certificate or approval issued under this title.

§ 21.45 [Amended]

7. Section 21.45 is amended in paragraph (b) by changing the words "or certified aircraft" to "on certificated aircraft"; and in paragraph (c) by changing "21.163" to "21.164".

§§ 21.121 - 21.130 [Removed and Reserved]

8. Subpart F (§§ 21.121 - 21.130) is removed and the subpart heading is reserved.

9. Subpart G is revised to read as follows:

SUBPART G -- PRODUCTION APPROVALS

21.131 Applicability; requirement for production approval.
21.133 Eligibility.
21.135 Issuance of production approval.
21.137 Production system limitations.
21.139 Privileges.
21.141 Responsibility of the production approval holder.
21.143 Amendment, transferability, and duration of a production certificate or parts production approval.
21.145 Quality system.
21.147 Quality system documentation.
21.149 Management responsibility.
21.151 Design and data control.
21.153 Document control.
21.155 Supplier control.
21.156 Process control.

21.157 Inspecting and testing.
21.158 Control of inspection, measuring, and test equipment.
21.159 Inspection and test status.
21.160 Nonconforming products, parts, materials, and services control.
21.161 Corrective and preventive action.
21.162 Handling, storage, packaging, preservation, and delivery.
21.163 Control of quality records.
21.164 Internal quality audits.
21.165 Final approval of product or part.

§ 21.131 Applicability; requirement for production approval.

(a) This subpart prescribes procedural requirements for the issue of production certificates and other production approvals, and requirements governing the holders of those certificates and approvals.

(b) All persons holding production certificates, approved production inspection systems, Parts Manufacturer Approvals, or Technical Standard Order authorizations issued before [insert effective date of rule] are required to show compliance with the rules for the quality system in this subpart in effect on [insert effective date of rule] by [insert two years after effective date].

(c) Except as provided in paragraph (d) of this section, no person may produce a product or part and represent that product or part **as suitable** for installation on a type certificated product **or on an FAA-approved** part, unless that product or part was **produced under an FAA** production certificate or other FAA production approval.

(d) A person may produce one of the following parts and represent that part as suitable for installation on a type certificated product or an FAA-approved part if:

(1) For a standard ~~part~~ or a Commercial part the part conforms to the definition in § 1.1 of this chapter.

(2) The part is produced by an owner or operator for maintaining or altering that owner's or operator's product or other part.

(3) The part is produced by a certificated repair station or a certificated airman and installed on a product or other part in accordance with part 145 or part 43 of this chapter.

(e) For purposes of this section:

(1) A person "produces" a part if that person controls the design, manufacture, or quality of the part.

(2) An owner or operator produces a part "for maintaining or altering the owner's or operator's product or other part" if the owner or operator produces the part and the part is installed on the owner's or operators' product or other part.

(3) If a part is offered for transfer to anyone other than the owner or operator who produced it, or the certificated repair station or airman who produced it, it must be produced under a production certificate or approval.

§ 21.133 Eligibility.

(a) A person is eligible to apply for a production approval if the person --

(1) Holds for the product or part concerned:

(i) The existing design approval; or

(ii) Written authorization to use the existing design approval;

(2) Has facilities to manufacture the product or part or maintains quality surveillance over manufacturing facilities capable of producing the product or part for which approval is sought; and

(3) Has established and maintains a quality system as specified in § ~~21.145 at a manufacturing facility within the United States.~~ **21.145.**

(b) Each application for a production approval must be made to the FAA and must be in a form, manner, and location prescribed by the Administrator.

§ 21.135 Issuance of production approval.

(a) An applicant is entitled to a production approval if the Administrator finds, after examination of the supporting data and after inspection of the organization and production facilities, that the applicant has complied with the requirements of this subpart.

(b) The Administrator may authorize more than one product or part that has received design approval to be manufactured under the terms of one production approval.

(c) The Administrator may authorize a production approval holder to proceed with the manufacture of a limited quantity of products or parts prior to meeting all of the conditions set out in this subpart. The Administrator may, under § 21.137(b), specify restrictions on the use of elements of the manufacturer's quality system, and may impose specific inspections and tests for products and parts produced in this manner. This authorization may be made if the production approval holder is proceeding with its design or production approval process for that aeronautical product or part.

(d) The Administrator does not issue a production approval if the manufacturing facilities concerned are located outside the United States, unless the Administrator finds no undue burden on the United States in administering the applicable requirements of this chapter.

(e) If acceptable to the Administrator, parts manufactured outside of the United States may be produced under a parts production approval or an equivalent production approval of the

country of manufacture or an FAA approved supplier control system. For TSO articles, the country of manufacture must --

(1) Certify that the article has been examined, tested, and found to meet the applicable TSO or the applicable performance standards of the country in which the article was manufactured and any other performance standards the Administrator may prescribe to provide a level of safety equivalent to that provided by the TSO; and

(2) Issue ~~a Certificate of Airworthiness for Export~~**an airworthiness approval,** as specified in § 21.502(a).

§ 21.137 Production system limitations.

A production limitation record is issued as part of the production approval. The record lists products or parts as defined in § 21.1(d) and (e) that the production approval holder is authorized to manufacture under the terms of the production approval. The production limitation record must include the following:

(a) Production approval ratings and limitations on the products or parts authorized for production, referencing the

design approval.

(b) All special limitations on the production system based on existence and scope of the quality system elements specified in this subpart.

§ 21.139 Privileges.

(a) The holder of a production approval may, without further showing:

(1) Obtain an airworthiness certificate for aircraft produced under a production certificate;

(2) Except for aircraft, issue an airworthiness approval for products or parts produced under the production approval; and

(3) Perform maintenance or preventive maintenance of its products or parts prior to initial release-to-service.

(b) The holder of a production approval who is proceeding with a design approval for a new product or part that is similar to those on the production limitation record may, without further showing, manufacture under its production approval a limited quantity of products or parts prior to meeting all of the requirements set out in this subpart, including all elements of the approved quality system. After design approval these limited ~~production parts~~**Parts Production** are eligible for airworthiness approval, as specified in § 21.329(c).

(c) The holder of a production certificate who is proceeding with a design approval for a new product or part of the same type as that on the production limitation record may, without further showing, issue airworthiness approvals on products other than aircraft or parts pending the issue of design approval for those products or parts, as specified in § 21.333.

(d) Notwithstanding the provisions of § 147.3 of this chapter, the holder of a production certificate for a primary category aircraft, or for a normal, utility, or acrobatic category aircraft of a type design that is eligible for a special airworthiness certificate in the primary category under § 21.184(c), may --

(1) Conduct training for persons in the performance of a special inspection and preventive maintenance program approved as a part of the aircraft's type design under § 21.24(b), provided the training is given by a person holding a mechanic certificate with appropriate ratings issued under part 65 of this chapter; and

(2) Issue a certificate of competency to persons successfully completing the approved training program, provided the certificate specifies the aircraft make and model to which the certificate applies.

§ 21.141 Responsibility of the production approval holder.

The holder of a production approval shall --

(a) Document, maintain and assure compliance with the quality system in accordance with the approved documentation;

(b) Immediately notify the FAA in writing of any changes to the quality system or location of a manufacturing facility that could affect the inspection, conformity, or airworthiness of the product or part;

(c) Determine that each product or part conforms to the approved design and is in a condition for safe operation prior to release;

(d) Report to the design approval holder, if different from the production approval holder, all deviations from the quality system necessary for analysis and possible reporting under § 21.3;

(e) Report to the design approval holder all undocumented nonconforming products or parts which could have left the quality system, if the production approval holder is different from the design approval holder;

(f) Maintain a complete and current technical data file for each product or part manufactured under the production approval;

(g) Maintain complete quality records for 2 years for the products or parts manufactured under the approval and for 10 years for critical components identified under § 45.14 of this chapter;

(h) Issue an FAA airworthiness approval for each shipment;

(i) Assure that only authorized personnel issue FAA airworthiness approvals;

(j) Maintain proper maintenance records for 2 years for each product or part that has been maintained under the production approval prior to release to service;

(k) Mark all products or parts in accordance with part 45 of this chapter;

(l) Allow the Administrator to make all inspections, tests, and investigations at its facilities or any supplier facilities necessary to determine compliance with the applicable regulations in this subchapter; and

(m) Display the approval and ratings at a place in the manufacturing facility that is normally accessible to the public and is not obscured. The approval must be available for inspection by the Administrator.

§ 21.143 Amendment, transferability, and duration of a production approval.

(a) The holder of a production approval may request an amendment to the approval by applying to the FAA in a form, manner, and location prescribed by the Administrator.

(b) A production approval is not transferable.

(c) A production approval is effective until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator.

§ 21.145 Quality system.

Each applicant shall establish and document and each holder shall maintain a quality system that ensures that each product or part conforms to the approved design and is in a condition for safe operation prior to release. The documentation must be in a retrievable form acceptable to the Administrator.

§ 21.147 Quality system documentation.

(a) The quality system shall be documented and submitted to the Administrator for approval. Documentation that defines the quality system shall be available for review by the Administrator. This quality system documentation must describe the following elements:

(1) Management responsibility.

(2) Design and data control.

(3) Document control.

(4) Supplier control.

(5) Process control.

(6) Inspection and testing.

(7) Inspection, measuring, and test equipment control.

(8) Inspection and test status.

(9) Nonconforming materials, products, and parts control.

(10) Corrective and preventive action.

(11) Handling, storage, packaging, preservation, and delivery.

(12) Quality records control.

(13) Internal quality audits.

(14) Final release of products or parts.

(b) Each applicant for a production approval shall establish and document and each holder shall maintain a method for receiving and processing feedback on service problems from users and installers of the product. Included shall be a method of providing assistance to the design approval holder, if different from the production approval holder--

(1) In dealing with any service problems involving potential design changes; and

(2) In determining if any changes to the instructions for continued airworthiness are necessary.

§ 21.149 Management responsibility.

Each applicant shall:

(a) Appoint a management representative with defined authority and responsibility to ensure implementation and compliance with the approved quality system.

(b) Define and document the responsibility, authority, and interrelation of key personnel who manage work affecting the approved quality system. Each applicant shall include in their approved quality system an organization chart showing the chain of authority to include any delegations of that authority.

§ 21.151 Design and data control.

Each applicant shall establish and each holder shall maintain procedures for the control of design data and subsequent configuration control to ensure that only approved current and correct configuration data is used for parts and products produced, and processes performed under the authority of the production approval. The procedures shall include a method to ensure conformance of products or parts manufactured under a pending design or production approval pursuant to the provisions of § 21.135(c).

§ 21.153 Document control.

Each applicant shall establish and each holder shall maintain procedures to control documents and data that form a

part of the quality system and any subsequent changes. The procedures shall ensure that documents and data are reviewed for adequacy and approved by authorized personnel prior to incorporation into the quality system.

§ 21.155 Supplier control.

Each applicant shall establish and each holder shall maintain procedures to ensure conformance of supplier furnished products, parts, materials, and services to the approved design prior to release for installation in the product or part.

§ 21.156 Process control.

Each applicant shall establish and each holder shall maintain processes to control the manufacture, assembly, and quality of products or parts to the approved design.

§ 21.157 Inspecting and testing.

Each applicant shall establish and each holder shall maintain procedures for all types of inspection and test activities to verify conformity of products and parts to the approved design.

§ 21.158 Inspection, measuring, and test equipment control.

Each applicant shall establish and each holder shall maintain a system to ensure that all inspection, measuring, and test equipment is calibrated, controlled, and serviced before use in determining conformity of products and parts to the approved design. The calibration accuracy must be appropriate for its intended measurement and traceable to the National Institute of Standards and Technology, or other standards acceptable to the Administrator.

§ 21.159 Inspection and test status.

Each applicant shall establish and each holder shall maintain procedures for the identification of in-process, final inspection, and test status of materials, products, and parts supplied, manufactured, and assembled to the approved design.

§ 21.160 Nonconforming products, parts, materials, and services control.

Each applicant shall establish and each holder shall maintain procedures to ensure that products, parts, materials, and services that do not conform to approved design are prevented from unintended use or installation. This control shall provide for identification, documentation, evaluation, segregation, and disposition of nonconforming products or parts, and notification to qualified functions of the approval holder's organization.

Disposition determinations are to be accomplished by qualified functions within the approval holder's organization.

§ 21.161 Corrective and preventive action.

Each applicant shall establish and each holder shall maintain procedures for implementing a corrective and preventive action system to eliminate or minimize the causes of actual or potential nonconformities to the approved design.

§ 21.162 Handling, storage, packaging, preservation, and delivery.

Each applicant shall establish and each holder shall maintain procedures for the control and protection of work in progress and for materials, products, and parts in storage or transit.

§ 21.163 Control of quality records.

Each applicant shall establish and each holder shall maintain procedures for identification and retrieval of the quality records specified in § 21.141(g) that demonstrate the product's or part's conformance to the approved design.

§ 21.164 Internal quality audits.

Each applicant shall establish and each holder shall maintain procedures for planning and conducting internal quality audits for the purpose of assuring compliance with the approved quality system.

§ 21.165 Final release of product or part.

Each applicant shall establish and each holder shall maintain procedures for issuing an airworthiness approval for each shipment of products or parts after verifying that the product(s) or part(s) conform to the approved design and is in condition for safe operation. The airworthiness approvals may only be issued by personnel identified within this quality system.

10. Subpart K is revised to read as follows:

SUBPART K - PARTS DESIGN APPROVAL FOR REPLACEMENT AND MODIFICATION PARTS

21.301 Applicability.
21.303 Application for parts design approval.
21.305 Issue of parts design approval.
21.307 Transferability.
21.309 Duration.
21.311 Design changes.

§ 21.301 Applicability.

(a) **This** subpart prescribes the procedural requirements for the issue of parts design approvals, changes to parts design

approvals, and the requirements governing holders of a parts design approval.

(b) A parts design approval is issued for a replacement or modification part.

(c) A parts design approval includes the approval of all parts within the design.

§ 21.303 Application for parts design approval.

An application for a parts design approval for a part is made to the FAA in a form, manner, and location prescribed by the Administrator. The application must include the following:

(a) The identity of the product or part on which the part is to be installed.

(b) The design of the part which consists of --

(1) Drawings and specifications necessary to show the configuration of the part;

(2) Information on the dimensions, materials, manufacturing and quality processes necessary to define the structural strength and operational performance of the part; and

(3) Information on the marking requirements necessary to ensure **part 45** requirements are met.

(c) **Test** reports and computations, using a comparative or general analysis, as necessary **based on the criticality and complexity of the part**, to show that the design of the part meets

the airworthiness requirements of this chapter applicable to the product on which the part is to be installed.

(d) If the design of the part was obtained by a written authorization from a design approval holder, evidence of that authorization must be furnished.

(e) Instructions for Continued Airworthiness~~in accordance with § 21.50~~ that address any variance from those requirements applicable to the original design.

§ 21.305 Issue of parts design approval.

An applicant is entitled to a parts design approval for a part, if the Administrator finds, upon examination of the design and after completing any required tests and inspections, that the design meets the performance and airworthiness requirements of this chapter applicable to the product or TSO article on which the part is to be installed.

§ 21.307 Transferability.

A parts design approval issued under this subpart may be transferred to or made available to a third person by written authorization. Each grantor shall, within 30 days after transfer of the parts design approval or execution or termination of a written authorization, notify in writing, the FAA office that issued the parts design approval. The notification must state

the name and address of the transferee or authorized person, date of the transaction, and, in the case of a written authorization, the extent of the authority granted the authorized person.

§ 21.309 Duration.

A parts design approval issued under this section is effective until surrendered, withdrawn or otherwise terminated by the Administrator. The design approved under a Parts Manufacturer Approval issued before (***effective date of final rule)*** is considered to meet the parts design approval requirements of this subpart.

§ 21.311 Design changes.

A holder of a parts design approval may only make design changes in accordance with the following:

(a) Minor design changes under a parts design approval may be approved in a method acceptable to the Administrator before submitting to the Administrator any substantiating or descriptive data.

(b) Major design changes in a parts design approval must have the substantiating data and necessary descriptive data submitted to the Administrator for approval prior to inclusion into the parts design approval.

11. Subpart L is revised to read as follows:

SUBPART L -- AIRWORTHINESS APPROVALS

21.321 Applicability.
21.323 Eligibility.
21.325 Kinds of approval.
21.327 Application.
21.329 Issue of airworthiness approvals.
21.331 Responsibility of exporters.
21.333 Airworthiness approval of products and parts prior to issuance of a design approval.

§ 21.321 Applicability.

This subpart prescribes --

(a) Procedural requirements for the issue of airworthiness approvals; and

(b) Rules governing the issuance of those approvals.

§ 21.323 Eligibility.

(a) To be eligible for an airworthiness approval, a product or part must be:

(1) In conformance with approved design;

(2) In a condition for safe operation prior to release;

(3) Identified as required by part 45 of this chapter; and

(4) Manufactured under a production approval, except for those aircraft eligible for an airworthiness certificate under § 21.183(d).

(b) To be eligible for a limited airworthiness approval, a product or part must meet all the requirements specified in

paragraph (a) of this section except for specified exceptions listed on the limited airworthiness approval document. A product or part with a limited airworthiness approval may be considered airworthy only when the specified exception is either corrected or approved, and the product or part meets the requirements of paragraph (a) of this section.

§ 21.325 Kinds of approvals.

(a) Domestic airworthiness approval of aircraft is documented in the form of an Airworthiness Certificate.

(b) Export airworthiness approval of aircraft is documented in a form, manner, and location prescribed by the Administrator.

(c) Airworthiness approval of a part or product other than an aircraft or a part is documented in a form, manner, and location prescribed by the Administrator.

§ 21.327 Application.

An application for airworthiness approval is made in a form, manner, and location prescribed by the Administrator.

§ 21.329 Issue of airworthiness approvals.

(a) An applicant is entitled to a domestic airworthiness approval for aircraft as prescribed in Subparts H or I of this part.

(b) An applicant is entitled to an export airworthiness approval for an aircraft if that applicant shows that eligibility requirements of § 21.323 have been met.

(c) An applicant is entitled to an airworthiness approval for a product other than aircraft or a part if that applicant shows all eligibility requirements of § 21.323 have been met.

(d) A person authorized to return products other than aircraft or parts to service as provided in § 43.5 of this chapter may issue an airworthiness approval for return to service without further showing provided the~~part or~~ product other than a aircraft or part has been maintained or altered within the limits of that person's authorization.

§ 21.331 Responsibility of exporters.

Unless an exception from the Importing Authority is granted, each exporter shall meet the requirements of the importing country. The agreement shall be a written statement by the importing country. The written statement must list the requirements not met. The requirements not met must also be listed on the airworthiness approval.

§ 21.333 Airworthiness approval of products or parts prior to issuance of a design approval.

An applicant who manufactures products or parts under § 21.139(b), or such applicant's authorized representative, may issue an airworthiness approval under § 21.139(c) for applicable products other than aircraft or parts prior to issuance of the pending type certificate when the applicant has an acceptable means of recalling products or parts that are not approved as part of the subsequent type certificate approval.

12. **Section 21.500 is revised to read as follows:**

§ 21.500 Approval of engines and propellers.

Each holder of licensee of a U.S. type certificate for an aircraft engine or propeller manufactured in a foreign country with which the United States has an agreement for the acceptance of those products for export and import, shall furnish with each such aircraft engine or propeller imported into this country, an airworthiness approval authorized by the country of manufacture certifying that the individual aircraft engine or propeller conforms to its approved design and is in condition for safe operation.

13. Section 21.502 is amended by revising paragraph (a) to read as follows:

§ 21.502 Approval of materials, parts, and appliances.

(a) A material, part, or appliance manufactured in a foreign country with which the United States has an agreement for the acceptance of those materials, parts, or appliances for export and import, is considered to meet the requirements for approval in the Federal Aviation Regulations when an airworthiness approval authorized by the country of manufacture is issued certifying that the individual material, part, or appliance meets those requirements, unless the Administrator finds, based on the technical data submitted under paragraph) of this section, that the material, part, or appliance is otherwise not consistent with the intent of the Federal Aviation Regulations.

* * * * *

14. Subpart O is revised to read as follows:

SUBPART O -- PARTS DESIGN APPROVAL FOR TECHNICAL STANDARD ORDER ARTICLES

21.601 Applicability.
21.603 Application for parts design approval for TSO articles.
21.605 Approval for deviation from Technical Standard Order.
21.607 Issue or denial of parts design approval for TSO articles.
21.609 Design changes.
21.611 Issue of parts design approval for TSO articles: import articles.
21.613 Inspection and test.
21.615 Transferability and duration.

§ 21.601 Applicability.

(a) This subpart prescribes --

(1) Procedural requirements for the issue of parts design approvals for TSO articles.

(2) Requirements governing the holders of Technical Standard Order parts design approvals; and

(3) Procedural requirements for the issuance of parts design approval for import TSO articles.

(b) For the purpose of this subpart --

(1) A Technical Standard Order (referred to in this subpart as "TSO") is issued by the Administrator and is a minimum performance standard for specified articles (materials, parts, items, processes, or appliances) used on civil aircraft.

(2) A parts design approval for TSO articles is issued by the FAA to the applicant for an article found to meet the applicable requirements of a specific TSO.

(3) A parts design approval for TSO import articles is an FAA approval for a foreign designed article which has been found to meet a specific TSO in accordance with § 21.611.

§ 21.603 Application for TSO parts design approval.

(a) **An application** for TSO parts design approval is made in a form, **manner,** and location prescribed by the Administrator and is submitted to the FAA. The application must include the following:

(1) A statement of conformance certifying that the applicant has met the requirements of the applicable TSO that is effective on the date of application for that article,

(2) One copy of the technical data required in the applicable TSO.

(b) When a series of minor changes in accordance with § 21.609 is anticipated, the applicant may set forth in its application the basic model number of the article and the part number of the components. A method to indicate how the configuration will be changed from time to time should be added if applicable.

§ 21.605 Approval for deviation from Technical Standard Order.

(a) An applicant who requests approval to deviate from any requirement of a TSO shall show that the requirement from which a deviation is requested is compensated for by factors or design features providing an equivalent level of safety.

(b) The request for approval to deviate, together with all pertinent data, must be submitted to the FAA in a form, manner, and location prescribed by the Administrator. If the applicant is located in another country, the request for approval to deviate, together with all pertinent data, must be submitted through the civil aviation authority in that country to the FAA.

§ 21.607 Issue or denial of TSO parts design approval.

(a) Except as provided in paragraph (b) of this section, an applicant is entitled to a TSO parts design approval (including all TSO deviations granted to the applicant) when the applicant substantiates compliance with this part.

(b) The applicant must, when requested by the Administrator, submit any additional information necessary to show compliance with this part. If the applicant fails to submit the additional information within 30 days of the Administrator's request, the applicant will be notified that the application is denied.

(c) The Administrator will issue or deny the application within 30 days after its receipt or, if additional information has been requested, within 30 days after receiving that information.

§ 21.609 Design changes for TSO articles.

(a) The holder of design approval for TSO articles may make minor design changes (any change other than major) without further approval by the Administrator. In this case, the changed article keeps the original model number (part numbers may be used to identify minor changes) and the manufacturer shall forward to the appropriate Aircraft Certification Office for the geographic

area, all revised data that are necessary for compliance with § 21.603(a).

(b) Each change to the approved design that is extensive enough to require a substantially complete investigation to determine compliance with a TSO is a major change. Before making such a change, the holder of a TSO design approval shall assign a new type or model designation to the article and apply for a TSO design approval under § 21.603.

§ 21.611 Issue of parts design approval for TSO articles: import articles.

(a) A parts design approval for a TSO articles may be issued for an article that is designed in a foreign country with which the United States has an agreement for the acceptance of these articles for import and that is to be imported into the United States if --

(1) The design meets the applicable TSO or the applicable performance standards of the country in which the article was designed and any other performance standards the Administrator may prescribe to provide a level of safety equivalent to that provided by the TSO; and

(2) The applicant has submitted one copy of the technical data required in the applicable TSO through its civil aviation authority.

(b) The parts design approval will be issued by the Administrator and must list any deviations granted to the applicant under § 21.605.

§ 21.613 Inspection and tests.

Each applicant and each TSO parts design approval holder must allow the Administrator to make any inspection or test necessary to determine compliance with this subpart.

§ 21.615 Transferability and duration.

(a) A parts design approval for a TSO article issued under this subpart may be transferred to or made available for use by another person by written authorization. Each grantor shall, within 30 days after transfer of the parts design approval or execution or termination of a written authorization, notify in writing the FAA office that issued the parts design approval. The notification must state the name and address of the transferee or authorized person, date of the transaction, and, in the case of a written authorization, the extent of the authority granted the person using the approval.

(b) **A parts design approval issued under this subpart is effective until surrendered, withdrawn or otherwise terminated by the Administrator.**

(c) The design approved under a Technical Standard Order Authorization issued before (***effective date of final rule***) is considered to meet the parts design approval requirements of this subpart.

PART 45 -- IDENTIFICATION AND REGISTRATION MARKING

13. The authority citation for part 45 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40103, 40109, 40113-40114, 44101-44105, 44107-44108, 44110-44111, 44704, 44701, 44708-44709, 44711-44713, 45302-45303, 46104, 46304, 46306, 47122.

14. Subparts A and B are revised to read as follows:

SUBPART A -- GENERAL

45.1 Applicability.

SUBPART B -- IDENTIFICATION OF PRODUCTS AND PARTS

45.3 Identification responsibilities and restrictions.
45.5 Identification requirements.
45.11 Type certificated products.
45.13 Owner or operator produced parts.
45.14 Identification of critical components.
45.17 TSO parts and TSO replacement parts.

SUBPART A -- GENERAL

§ 45.1 Applicability.

This part prescribes the requirements for --

(a) Identification of products and parts manufactured under a production approval:

(b) Identification of owner or operator produced parts manufactured under the provisions of § 21.131(d)(2) of this chapter.

(c) Identification of critical parts, as specified in § 45.14; and

(d) Nationality and registration marking of U.S. registered aircraft.

SUBPART B -- IDENTIFICATION OF PRODUCTS AND PARTS

§ 45.3 Identification responsibilities and restrictions.

(a) Products and parts produced under a production approval or by an owner/operator shall be identified in accordance with this part.

(b) Except as provided in paragraph (d) of this section, marking required by this part may only be applied by the production approval holder or the owner/operator for that product or part or the designated representative of the production approval holder or owner/operator.

(c) **No person may perform a major alteration of a product or part that is marked in accordance with this part, unless the marking is modified to reflect incorporation of such alteration.**

(d) Persons performing work under the provisions of part 43 of this chapter may, in accordance with methods, techniques, and practices acceptable to the Administrator --

(1) Remove, change, or place the identification information required by § 45.5; or

(2) Remove an identification plate required by § 45.11 when necessary during maintenance operations.

(e) No person may install an identification plate removed in accordance with paragraph (d)(2) of this section other than on the product or part from which it was removed.

§ 45.5 Identification requirements.

(a) Unless otherwise specified in this part, products, parts, and components of products and parts shall be identified, as a minimum, with the production approval holder's or builder's:

(1) Name, trademark, or symbol.

(2) Product or part identification number.

(b) Identification marks required by this section shall be permanent and legible at the time of application. Detail parts whose markings become obliterated during normal manufacturing processes need not be remarked.

(c) If the Administrator finds that a part is too small or otherwise impractical to mark with any of the information required by this part, a document attached to the part or its

container must include the information that could not be marked on the part.

(d) For the purposes of §§ 45.11, 45.13, 45.14, and 45.17, a serial number may be composed of any series of unique identifying letters, numbers or combinations of both that allow the unique identification of two like items.

§ 45.11 Type certificated products.

(a) Aircraft. (1) Aircraft covered under § 21.182 of this chapter must be identified with the information identified in § 45.5 and with a serial number. This data shall be supplied by means of a fireproof plate that has been permanently and legibly marked. The identification plate shall be placed on a noncritical surface that will not be likely to be defaced or removed during normal service, or lost or destroyed in an accident. Except as provided in paragraphs (a)(2), (a)(3), and (a)(4) of this section, the aircraft identification plate must be secured to the aircraft fuselage exterior so that it is legible to a person on the ground, and must be either adjacent to and aft of the rearmost entrance door or on the fuselage near the tail surfaces.

(2) For manned free balloons, the identification plate prescribed in paragraph (a)(1) of this section must be secured to the balloon envelope. In addition, the basket and heater

assembly must be permanently and legibly marked with the manufacturer's name, part number (or equivalent) and serial number.

(3) On aircraft manufactured before March 7, 1988, the identification plate required by paragraph (a)(1) of this section may be secured at an accessible exterior or interior location near an entrance, if the model designation and builder's serial number are also displayed on the aircraft fuselage exterior. The model designation and builder's serial number must be legible to a person on the ground and must be located either adjacent to and aft of the rear-most entrance door or on the fuselage near the tail surfaces. The numbers must be displayed in such a manner that they are not likely to be defaced or removed during normal service and maintenance.

(4) On aircraft manufactured for operation under part 121 or 127, or in commuter air carrier operation (as defined in part 135 and SFAR 38-7 of this chapter), or manufactured for export, the identification plate required by paragraph (a)(1) of this section may be secured to the aircraft at an accessible location near an exit.

(b) **Engines.** (1) Aircraft engines manufactured under a production certificate shall be identified in accordance with § 45.5, and shall include a serial number. This data shall be supplied by means of a fireproof plate that has been permanently

and legibly marked. The identification plate shall be placed on a noncritical surface that will not be likely to be defaced or removed during normal service, or lost or destroyed in an accident.

(2) In addition to the information required by paragraph (a)(1) of this section, on or after January 1, 1984, engines specified in part 34 of this chapter, shall be identified by the date of manufacture as defined in § 34.1 of this chapter, and a designation, approved by the Administrator, that indicates compliance with the applicable exhaust emission provisions of part 34 of this chapter and 40 CFR part 87.

(3) Each module of a modular engine configuration, as defined by the type design, shall be identified with information required in § 45.5 and with a serial number. This data shall be specified by means of a fireproof plate that has been permanently and legibly marked.

(c) Propellers, propeller blades, or propeller hubs. Propellers, propeller blades, or propeller hubs manufactured under a production certificate shall be identified in accordance with § 45.5 and with a serial number. The identification and serial number shall be placed on a noncritical surface that will not be likely to be defaced or removed during normal service or destroyed in an accident.

§ 45.13 Owner or operator produced parts.

Parts produced by an owner or operator shall be identified with:

(a) A part number with the prefix or suffix "OP."

(b) A date of manufacture or the serial number.

(c) A unique identification number (e.g., the number from a relevant airman certificate or operator certificate).

§ 45.14 Identification of critical components.

Parts produced under a production approval for which a replacement time, inspection interval, or related procedure is specified by the design approval holder in the Airworthiness Limitations section of a manufacturer's maintenance manual or Instructions for Continued Airworthiness shall be identified in accordance with § 45.5 and shall include a serial number. Non-life limited structural components are not subject to the requirements of this section.

§ 45.17 TSO articles and TSO replacement parts.

TSO articles shall be identified with the information required in § 45.5, the serial number or date of manufacture or both, the TSO number and letter designation, plus all markings specifically required by the applicable TSO. TSO replacement

parts shall be identified with the information required in § 45.5.

Issued in Washington, DC, on

Department of Transportation
Federal Aviation Administration
Aircraft Certification Service
Washington, DC

TSO-C149

Date: 4/24/98

Technical Standard Order

Subject: **TSO-C149, AIRCRAFT BEARINGS**

1. PURPOSE. This technical standard order (TSO) prescribes property test requirements to obtain the minimum performance of aircraft bearings to be identified with the applicable TSO marking.

2. APPLICABILITY. The standards of this TSO apply to the types of bearings described in appendix 1, Aircraft Bearing Property Test Requirements, intended for rotation and/or oscillatory applications in the manufacture and maintenance of aircraft products. The standards of this TSO are also adaptable to manufacturer's catalog bearings and bearings of proprietary designs. This TSO shall not be used for standard parts or parts known to be used in critical applications.

3. REQUIREMENTS. Aircraft bearings that are to be identified with this TSO and that are manufactured on or after the date of this TSO must meet the minimum performance standards specified in the manufacturer's part drawing(s) and applicable part specification(s) submitted with the bearing manufacturer's application for TSO authorization.

a. Test Requirements. The required performance shall be demonstrated by accomplishing the tests specified for each property in the part drawing(s) and applicable part specification(s), in accordance with the test procedures specified in appendix 1.

b. Deviations. Alternative test procedures or analytical data that produce an equivalent level of safety may be used if specified at the time of TSO application and approved in accordance with 14 CFR §21.609.

4. MARKING.

a. In addition to the marking specified in 14 CFR §21.607(d), the bearing type, the lubrication date (if applicable), and the manufacturer's inspection lot number shall be permanently and legibly marked on each package or container.

b. Each individual bearing that is manufactured under this TSO must be permanently and legibly marked with at least the name or symbol of the manufacturer, the manufacturer's part number, and TSO number. When this is not practical, marking may be accomplished in a manner acceptable by the Administrator.

5. DATA REQUIREMENTS.

a. In accordance with 14 CFR §21.605(a) the following data must be furnished to the Aircraft Certification Office (ACO) manager having purview of the manufacturer's facility with each TSO application:

(1) Part drawing(s) and applicable specifications necessary to define the design and minimum performance for each bearing part number.

(2) Manufacturer's TSO qualification test report in accordance with the test procedures specified in appendix 1.

(3) Inspection lot number(s) of qualification parts.

b. In addition to the data required by paragraph 5.a., the following data must be available for review by the ACO manager having purview of the manufacturer's facility:

(1) Copies of all standards/specifications used in the manufacturer's application for TSO authorization.

(2) Inspection lot number and quantity for each production lot of bearings.

(3) Acceptance inspection test results for each lot of bearings.

c. Data and information that must accompany aircraft bearings manufactured under this TSO:

(1) Inspection lot number(s) and quantity of parts shipped.

(2) Date of lubrication (if applicable) or date of manufacturer.

(3) A note with the following statement: "The parts contained in this shipment have been manufactured and inspected in accordance with TSO-C149. The conditions and tests required for TSO approval of this article are minimum performance standards. Aircraft bearings approved under this TSO are not necessarily interchangeable with other aircraft bearings approved under this TSO. Bearings of similar dimensional properties may have widely varying performance properties. Substitution of bearings may only be done if approved by the Administrator."

6. INSPECTION LOT OF BEARINGS. An inspection lot consists of assembled bearings of a particular part number, assembled at the same time and processed through all final assembly operations as a single group, and subsequently submitted for final inspection at one time.

7. AVAILABILITY OF REFERENCE DOCUMENTS.

a. Military documents may be purchased from: DoDSSP, Customer Service Subscription Service Desk, 700 Robins Avenue, Building 4D, Philadelphia, PA 19111-5094.

b. American National Standards Institute/American Bearing Manufacturers Association (ANSI/ABMA) documents may be purchased from, ABMA, 1200 19th Street NW, Washington, DC 20036.

c. American Society for Testing and Materials (ASTM) documents may be purchased from: ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

d. Federal Aviation Regulations Part 21, Subpart O, may be purchased from: Superintendent of Documents, Government Printing Office, Washington, DC 20402-9325.

e. Advisory Circular 20-110 (current revision), "Index of Aviation Technical Standard Orders," may be obtained from: U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785.

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Aircraft Certification Service

APPENDIX 1, AIRCRAFT BEARING PROPERTY TEST REQUIREMENTS

Table 1 - Aircraft Bearing Property Test Requirements, Rotational Motion

	Design Properties					Performance Properties	
Bearing Type	Materials	Hardness	Dimensions	Radial Internal Clearance	Radial Runout	Static Radial Load Rating	Dynamic Radial Load Rating
Ball	X	X	X	X	X	X	X
Miniature/Inst. Ball	X	X	X	X	X	X	X
Roller	X	X	X	X	X	X	X
Needle Roller	X	X	X	X	X	X	X
Applicable Documents	Drawing or Specification	ASTM E18	ANSI/ABMA, Standard 4 ANSI/ABMA, Standard 12.1 ANSI/ABMA, Standard 12.2			ANSI/ABMA, Standard 9 ANSI/ABMA, Standard 11 ANSI/ABMA, Standard 12.1 ANSI/ABMA, Standard 12.2	

Table 2 - Aircraft Bearing Property Test Requirements, Slow Rotational and Oscillatory Motion

	Design Properties							
Bearing Type	Materials	Hardness	Dimensions	Surface Treatment	Lubrication	Radial Internal Clearance	Axial Internal Clearance	**Applicable Documents**
Ball	X	X	X	X	X	X	X	MIL-B-7949
Rod ends with integral ball bearing	X	X	X	X	X	X	X	MIL-B-6039
Roller	X	X	X	X	X	X	X	MIL-B-8914
Rod ends with integral roller bearing	X	X	X	X	X	X	X	MIL-B-8952
Needle Roller	X	X	X	X	X	X	X	MIL-B-3990
Needle track rollers, Stud type	X	X	X	X	X	X	X	MIL-B-3990
Needle track rollers, yoke type	X	X	X	X	X	X	X	MIL-B-3990
Spherical plain, lubricated	X	X	X	X	X			MIL-B-8976
Rod ends with integral spherical plain bearings, lubricated	X	X	X	X	X			*MIL-B-81935 and *MIL-B-8976
Spherical plain bearings, self- lubricated	X	X	X	X				MIL-B-81820
Rod ends with integral spherical plain bearings, self-lubricated	X	X	X	X				MIL-B-81935
Journal bearings, straight and flanged, self-lubricated	X	X	X	X				MIL-B-81934

*MIL-B-81935 is applicable to testing; MIL-B-8976 is referenced for product features.

APPENDIX 1, AIRCRAFT BEARING PROPERTY TEST REQUIREMENTS (continued)

Table 2 (continued)

Bearing Type	Design Properties		Performance Properties					
	Radial Runout	Axial Runout	No-Load Breakaway Torque	Static Radial Limit Load	Static Axial Limit Load	Dynamic Radial Load Rating	Ultimate Static Radial Limit Load	Applicable Documents
Ball	X	X	X	X	X	X	X	MIL-B-7949
Rod ends with integral ball bearing	X		X	X			X	MIL-B-6039
Roller	X		X	X			X	MIL-B-8914
Rod ends with integral roller bearing	X		X	X			X	MIL-B-8952
Needle Roller				X			X	MIL-B-3990
Needle track rollers, Stud type				X			X	MIL-B-3990
Needle track rollers, yoke type				X			X	MIL-B-3990
Spherical plain, lubricated			X	X	X	X	X	MIL-B-8976
Rod ends with integral spherical plain bearings, lubricated			X	X	X	X	X	*MIL-B-81935 and *MIL-B-8976
Spherical plain bearings, self-lubricated			X	X	X	X	X	MIL-B-81820
Rod ends with integral spherical plain bearings, self-lubricated			X	X	X	X	X	MIL-B-81935
Journal bearings, straight and flanged, self-lubricated				X	X	X	X	MIL-B-81934

*MIL-B-81935 is applicable to testing; MIL-B-8976 is referenced for product features.

AIRCRAFT BEARING PROPERTY TEST REQUIREMENTS

1. BEARING PROPERTIES. Tables 1 and 2 specify bearing property test requirements for each bearing type, as defined on the manufacturers drawing(s) and/or specification(s). The specific material and specific design property values, such as, hardness or dimensions, form the basis of the bearing design; the specific values for performance properties, such as, static radial load rating or ultimate static radial load limit form the basis of the bearing "minimum performance."

2. BEARING SERIES TEST SAMPLE. A bearing series (model) of a particular design and type, with a range defined in the bearing manufacturer's application for TSO authorization, may be qualified by submitting test data for a sample that is most representative of the design encompassed by the series.

APPENDIX 1, AIRCRAFT BEARING PROPERTY TEST REQUIREMENTS (continued)

Applicable Documents. The revision of the documents (or successor documents) listed below in effect on the date of TSO application must be acceptable to the administrator and used to establish the procedures for test and evaluation of aircraft bearings, as indicated in the part drawing and procurement or product specification(s). All additional specifications governing test and evaluation of a bearing covered by this TSO must be specified at the time of application for TSO authorization.

MIL-B-3990	Military Specification, Bearings, Roller, Needle, Airframe, Anti-friction, Inch
MIL-B-6039	Military Specification, Bearing, Double Row, Ball Sealed, Rod End, Anti-friction, Self-Aligning
MIL-B-7949	Military Specification, Bearings, Ball, Airframe, Anti-friction
MIL-B-8914	Military Specification, Bearing, Roller, Self-Aligning, Airframe, Anti-friction
MIL-B-8952	Military Specification, Bearing, Roller, Rod End, Anti-friction, Self-Aligning
MIL-B-8976	Military Specification, Bearing, Plain, Self-Aligning, All-Metal
MIL-B-81820	Military Specification, Bearings, Plain, Self-Aligning, Self-Lubricating, Low Speed Oscillation, General Specification For
MIL-B-81934	Military Specification, Bearings, Plain, Sleeve, Plain and Flanged, Self-Lubricated
MIL-B-81935	Military Specification, Bearings, Plain, Rod End, Self-Aligning, Self-Lubricating, Low Speed Oscillation, General Specification For
ANSI/ABMA	Standard 4, Tolerance Definitions and Gauging Practices for Ball and Roller Bearings
ANSI/ABMA	Standard 9, Load Ratings and Fatigue Life for Ball Bearings
ANSI/ABMA	Standard 11, Load Ratings and Fatigue Life for Roller Bearings
ANSI/ABMA	Standard 12.1, Instrument Ball Bearings, Metric Design
ANSI/ABMA	Standard 12.2, Instrument Ball Bearings, Inch Design
ASTM E 18	Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

Department of Transportation
Federal Aviation Administration
Aircraft Certification Service
Washington, DC

TSO-C150

Date: 4/24/98

Technical Standard Order

Subject: **TSO-C150, AIRCRAFT SEALS**

1. PURPOSE. This technical standard order (TSO) prescribes property test requirements to obtain the minimum performance of aircraft seals to be identified with the applicable TSO marking.

2. APPLICABILITY. The standards of this TSO apply to the types of seals described in appendix 1, Aircraft Seal Property Test Requirements, intended for static and dynamic applications in the manufacture and maintenance of aircraft products. The standards of this TSO are also adaptable to manufacturer's catalog seals and seals of proprietary designs. This TSO shall not be used for standard parts or parts known to be used in critical applications.

3. REQUIREMENTS. Aircraft seals that are to be identified with this TSO and that are manufactured on or after the date of this TSO must meet the minimum performance standards specified in the manufacturer's part drawing(s) and applicable part specification(s) submitted with the seal manufacturer's application for TSO authorization.

a. Test Requirements. The required performance shall be demonstrated by accomplishing the tests specified for each property in the part drawing and applicable part specification(s) in accordance with the test procedures specified in appendix 1.

b. Deviations. Alternative test procedures that produce an equivalent level of safety may be used if specified at the time of TSO application and approved in accordance with 14 CFR §21.609.

4. MARKING.

a. In addition to the marking specified in 14 CFR §21.607(d), the seal type, the manufacturer's inspection lot number, and the expected shelf life shall be permanently and legibly marked on each package or container.

b. Each individual seal that is manufactured under this TSO must be permanently and legibly marked with at least the name or symbol of the manufacturer, the manufacturer's part number, and TSO number. When this is not practical, marking may be accomplished in a manner approved by the Administrator.

5. DATA REQUIREMENTS.

a. In accordance with 14 CFR §21.605 (a) the following data must be furnished to the Aircraft Certification Office (ACO) manager having purview of the manufacturer's facility with each TSO application:

(1) Part drawing and applicable specifications necessary to define the design and minimum performance for each seal part number.

(2) Manufacturer's TSO Qualification test report in accordance with the test procedures specified in appendix 1.

(3) Seal limitations.

(4) Inspection lot number(s) of qualification parts.

(5) Batch traceability number(s) of the qualification parts material.

b. In addition to the data required by paragraph 5.a., the following data must be available for review by the ACO manager having purview of the manufacturer's facility:

(1) Copies of all standards/specifications used in the manufacturer's application for TSO authorization.

(2) Inspection lot number and quantity for each production lot of seals.

(3) Batch traceability number of the material for each lot of seals.

(4) Acceptance test results for each lot of seals.

c. Data and information that must accompany aircraft seals manufactured under this TSO:

(1) Inspection lot number(s) and quantity of parts shipped.

(2) A note with the following statement: "The parts contained in this shipment have been manufactured and inspected in accordance with TSO-C150. The conditions and tests required for TSO approval of this article are minimum performance standards. Aircraft seals approved under this TSO are not necessarily interchangeable with other aircraft seals approved under this TSO. Seals of similar dimensional properties may have widely varying performance and material properties. Substitution of seals may only be done if acceptable to or approved by the Administrator."

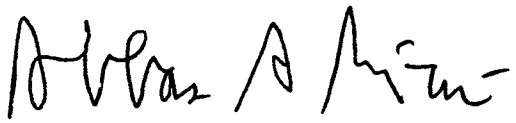
6. INSPECTION LOT OF SEALS. An inspection lot consists of a quantity of seals with one part number produced consecutively from a single batch of material and finished in one continuous process and subsequently submitted for final inspection at one time.

7. AVAILABILITY OF REFERENCE DOCUMENTS.

a. American Society for Testing and Materials (ASTM) documents may be purchased from: ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

b. Federal Aviation Regulations Part 21, Subpart O, may be purchased from: Superintendent of Documents, Government Printing Office, Washington, DC 20402-9325.

c. Advisory Circular 20-110 (current revision), "Index of Aviation Technical Standard Orders," may be obtained from: U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785.



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APPENDIX 1, AIRCRAFT SEAL PROPERTY TEST REQUIREMENTS

Table 1 - Aircraft Seal Property Test Requirements

Seal Type	Design Properties		Performance Properties		
Static, Dynamic Reciprocating, or Dynamic Rotating	Material	Dimensions/ Configuration	Fluid Compatibility	Heat Resistance	Abrasion Resistance
Pneumatic	X	X		X	X
Hydraulic	X	X	X	X	
Environmental	X	X		X	
Insulating	X	X		X	X
Dampening	X	X			
Anti-Extrusion	X	X	X		X
Applicable Documents	Table 2 (below)	Seal Drawing	ASTM D471	ASTM D395, D573	ASTM D2228

Table 2 - Aircraft Seal Property Test Requirements for Materials

Material Properties	ASTM Test Method	
	Plastic	**Rubber**
Hardness	D2240 ("D" Scale)	D2240 ("A" Scale)
Specific Gravity	D792	D297
Tensile Strength at Break	D4894	D412, D1414
Ultimate Elongation	D4894, D4745	D412, D1414
Optional Testing		
Compression Set	D695	D395
Heat Resistance	D3045, D5510	D573
Fluid Compatibility	D543	D471
Water Absorption	D570	N/A
Abrasion Resistance	Determined by Manufacturer (repeatability must be demonstrated)	D2228

AIRCRAFT SEAL PROPERTY TEST REQUIREMENTS

1. SEAL PROPERTIES. Table 1 specifies seal property test requirements for each seal type, as defined on the manufacturers drawing(s) and/or specification(s). The specific material, meeting the material test property requirements of Table 2, and specific design property values for dimensions/configuration form the basis of the seal's design. The specific values for fluid compatibility, heat resistance, and abrasion resistance form the basis of the seal's "minimum performance."

2. SEAL SERIES TEST SAMPLE. A seal series (model) of a particular design and type, with a range defined in the seal manufacturer's application for TSO authorization, may be qualified by submitting test data for a sample that is most representative of the design encompassed by the series.

APPENDIX 1, AIRCRAFT SEAL PROPERTY TEST REQUIREMENTS (continued)

Applicable ASTM Test Methods. The revision of the documents (or successor documents) listed below in effect on the date of TSO application must be acceptable to the Administrator and used to establish the procedures for test and evaluation of aircraft seals as indicated in the part drawing and procurement or product specification(s). All additional specifications governing test and evaluation of a seal covered by this TSO must be specified at the time of application for TSO authorization.

D297 Test Methods for Rubber Products - Chemical Analysis

D395 Test Method for Rubber Property - Compression Set

D412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension

D471 Test Method for Rubber Property - Effect of Liquids

D543 Test Methods for Resistance of Plastics to Chemical Reagents

D570 Test Method for Water Absorption of Plastics.

D573 Test Method for Rubber - Deterioration in an Air Oven

D695 Test Method for Compressive Properties of Rigid Plastics

D792 Test Method for Specific Gravity and Density of Plastics by Displacement

D1414 Test Methods for Rubber O-Rings

D2228 Test Method for Rubber Property - Abrasion Resistance (Pico Abrader)

D2240 Test Method for Rubber Property - Durometer Hardness

D3045 Practice for Heat Aging Plastics Without Load

D4745 Specification for Filled Compounds of Polytetrafluorethylene (PTFE) Molding and Extrusion Materials

D4894 Specification for Polytetrafluorethylene (PTFE) Granular Molding and Ram Extrusion Materials

D5510 Practice for Heat Aging of Oxidatively Degradable Plastics

FAA Action – Not Available