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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 119, 121, 129, 135, and 183

[Dkt. No. FAA-1999-5401; Amdt. Nos. 119-6, 121-284, 129-34, 135-81, and 183-11]

RIN 2120-AE42

Aging Airplane Safety

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Interim final rule; request for comments.

SUMMARY: This final rule requires airplanes operated under Title 14, Code of Federal Regulations (14 CFR) part 121, U.S.-registered multiengine airplanes operated under 14 CFR part 129, and multiengine airplanes used in scheduled operations under 14 CFR part 135 to undergo inspections and records reviews by the Administrator or a designated representative after their 14th year in service and at specified intervals thereafter. These inspections and records reviews will ensure that the maintenance of these airplanes' age-sensitive parts and components has been adequate and timely.

The final rule also prohibits operation of these airplanes after specified deadlines unless damage-tolerance-based inspections and procedures are included in their maintenance or inspection programs. Operators of airplanes initially certificated with nine or fewer passenger seats,

however, may incorporate service-history-based inspections instead of damage-tolerance-based inspections and procedures in those airplanes' maintenance or inspection programs. This final rule does not apply to airplanes operated between any point within the State of Alaska and any other point within the State of Alaska.

This rule represents a critical step toward compliance with the Aging Aircraft Safety Act of 1991 and helps to ensure the continuing airworthiness of aging airplanes operating in scheduled service.

DATE: This interim final rule is effective December 8, 2003. ~~[Insert date 1 year after date of publication in the Federal Register].~~ Comments must be received on or before February 4, 2003. ~~[Insert date 60 days after date of publication in the Federal Register].~~ BF 11/27/02

ADDRESSES: Address your comments to the Docket Management System, U.S. Department of Transportation, Room Plaza 401, 400 Seventh Street, SW., Washington, DC 20590-0001. You must identify the docket number FAA-1999-5401 at the beginning of your comments, and you should submit two copies of your comments. If you wish to receive confirmation that FAA received your comments, include a self-addressed, stamped postcard.

You may also submit comments through the Internet to *http://dms.dot.gov*. You may review the public docket containing comments to this interim final rule in person in the Dockets Office between 9:00 a.m. and 5:00 p.m., Monday

through Friday, except Federal holidays. The Dockets Office is on the plaza level of the Nassif Building at the Department of Transportation at the above address. Also, you may review public dockets on the Internet at *http://dms.dot.gov*.

Comments that you may consider to be of a sensitive security nature should not be sent to the docket management system. Send those comments to the FAA, Office of Rulemaking, ARM-1, 800 Independence Avenue, SW., Washington, DC 20591.

FOR FURTHER INFORMATION CONTACT: Frederick Sobeck, Airplane Maintenance Division, AFS-304, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone (202) 267-7355; facsimile (202) 267-5115.

SUPPLEMENTARY INFORMATION:

Comments Invited

This interim final rule is based on comments received on Notice No. 99-02 entitled "Aging Airplane Safety." The final rule is significantly different from the proposed action due largely in response to the comments received. In some instances, the FAA agreed in total or in part with many comments. In other instances, we did not agree with the commenters' suggestions citing the need and providing further justification and rationale for certain requirements, as proposed.

The FAA believes it has developed a rule that fulfills its regulatory responsibility to meet the requirements of the Aging Aircraft Safety Act, and considers the impact on those affected and the recommendations and alternatives received in response to comments received. However, the FAA continually seeks to find ways to implement its rules at lower cost without compromising safety. To this end, we solicit comments from interested parties on how implementation costs for this rule could be further reduced. Substantive comments should be accompanied by cost estimates to the extent possible. Any recommendations for alternatives to the final rule adopted here should demonstrate that the alternative would provide a level of safety equivalent to this rule.

In particular, the FAA invites commenters to focus on alternatives posed by the Air Transport Association. For example, the ATA suggested that the proposal be framed as an Airworthiness Directive. As explained herein, the FAA does not agree that ADs should be used to implement the new requirements. Airworthiness Directives are used to address unsafe conditions that have already been identified. This rule is to ensure the continuing structural airworthiness of aircraft as they continue in service.

Further, the ATA believes the requirements of this rule exceed the requirements of the Aging Aircraft Safety Act (AASA) by requiring an unsegmented simultaneous review of each affected airplane and its records. The FAA has revised

the inspection requirements to enable operators who have segmented maintenance programs, for example, to work with their principal maintenance inspector to agree on which inspection examines the largest portion of the airplane. The operator can make the airplane available to the FAA during that inspection to ensure the inspection and records review is complied with in a comprehensive, efficient, and cost effective manner.

However, an operator who uses segmented maintenance programs may still be required under the rule adopted here to open and make available for inspection additional areas of the airplane to fulfill the requirements of the AASA. As explained in this preamble, we believe that opening additional areas may be necessary to ensure adequate inspections. However, we are sensitive to the additional cost that operators may incur when opening the aircraft more than originally planned. Therefore, commenters are invited to revisit this issue. If an inspection regime can be developed that would provide an equivalent level of safety by limit the amount of the aircraft opened at any one time, the FAA will consider revising the rule.

The FAA appreciates the significant contributions industry and the public has played in developing this significant and controversial rulemaking action. The comments have helped considerably to ensure the continuing airworthiness of aging airplanes.

The FAA has summarized in the preamble the comments received on the notice of proposed rulemaking along with the FAA's decision on each comment. Individual comments can be viewed in the docket (FAA-1999-5401) established for this rulemaking action. We invite you to provide additional comment on the interim final rule. We will consider all comments received on or before the closing date for comments. This final rule may be amended in light of comments received.

Availability of Rulemaking Documents

You can get an electronic copy using the Internet by taking the following steps:

(1) Go to the search function of the Department of Transportation (DOT)'s electronic Docket Management System (DMS) web page (http://dms.dot.gov/search).

(2) On the search page, type in the last four digits of the docket number shown at the beginning of this notice. Click on "search."

(3) On the next page, which contains the docket summary information for the docket you selected, click on the document number for the item you wish to view.

You can also get an electronic copy using the Internet through the FAA's web page at http://www.faa.gov/avr/arm/nprm.cfm?nav=nprm or the Government Printing Office's web page at http://www.access.gpo.gov/su_docs/aces/aces140.html.

You can also get a copy by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267-9680. Make sure to identify the amendment number or docket number of this rulemaking.

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires the FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. Therefore, any small entity that has a question regarding this document may contact their local FAA official, or the person listed under FOR FURTHER INFORMATION CONTACT. You can find out more about SBREFA on the Internet at our site, http://www.faa.gov/avr/arm/sbrefa.htm. For more information on SBREFA, e-mail us at 9-AWA-SBREFA@faa.gov.

Background

Statutory Requirements

In October 1991, Congress enacted Title IV of Public Law 102-143, the "Aging Aircraft Safety Act of 1991" (AASA), (subsequently codified as section 44717 of Title 49, United States Code (49 U.S.C.)) to address aging aircraft concerns that arose from an accident involving a Boeing 737 in April 1988. That airplane experienced explosive decompression as a result of structural failure, after being subjected to a high number of pressurization cycles. Section 402 of the AASA instructed the Administrator to

"initiate a rulemaking proceeding for the purpose of issuing a rule to assure the continuing airworthiness of aging aircraft." Section 402 also required "the Administrator to make such inspections and conduct such reviews of maintenance and other records of each aircraft used by an air carrier to provide air transportation as may be necessary to determine that such is in a safe condition and is properly maintained for operation in air transportation."

The AASA specified that these inspections and records reviews should be carried out "as part of each heavy maintenance check (HMC) of the aircraft conducted on or after the 14th year in which the aircraft has been in service." The statute also specified that an air carrier must be able to demonstrate as part of the inspection "that maintenance of the aircraft's structure, skin, and other age-sensitive parts and components have been adequate and timely enough to ensure the highest degree of safety."

The AASA further instructed the Administrator to issue a rule requiring that an air carrier make its aircraft available for inspection as may be necessary to comply with the rule.

History

The FAA's efforts to address the safety of older airplanes is known collectively as the "Aging Airplane Program." That program addresses transport category airplanes, commuter category airplanes, engines, maintenance, and research. Through the program, the FAA

determined that the Airbus A300; Boeing 707, 720, 727, 737, and 747; British Aerospace (BAe) BAC 1-11; Fokker F-28; Lockheed L-1011; and McDonnell Douglas DC-8, DC-9/MD-80, and DC-10 airplanes were approaching design-life goals established by each airplane's type certificate holder. To permit the continued safe operation of these airplanes the FAA adopted a policy of mandated structural modifications and inspections through a series of airworthiness directives (ADs) that address specific design deficiencies that could lead to airplane structural damage.

Type certificate holders also established recommended Corrosion Prevention and Control Programs (CPCPs) for a number of aging transport category airplanes. Corrosion can progressively degrade an airplane's strength until its structure can no longer sustain its designed load. These CPCPs serve as a supplement to existing maintenance requirements.

Additionally, the FAA (1) evaluated methodologies to assess airplane structural repairs, (2) revised Supplemental Structural Inspection Documents (SSIDs), and (3) evaluated the revised Structural Maintenance Program General Guidelines Document, for older airplanes.

On April 2, 1999, the FAA issued a notice of proposed rulemaking (NPRM) entitled "Aging Airplane Safety" (64 FR 16298, Notice No. 99-02). The comment period for Notice No. 99-02 closed on August 2, 1999; however, the FAA reopened the comment period (64 FR 45090) and that comment

period closed on October 18, 1999. The FAA issued this NPRM primarily to expand the use of damage-tolerance-based supplemental structural inspection programs (SSIPs) to a larger proportion of the airplanes used in air transportation and mandate the inspections and records reviews required by the AASA.

Related Activity

Based on the comments received to that NPRM and the related proposed advisory circulars simultaneously made available for comment, the FAA decided not to publish Advisory Circular (AC) 91-MA, "Continued Airworthiness of Older Small Transport and Commuter Airplanes; Establishment of Damage-Tolerance-Based Inspections and Procedures. However, draft AC 120-XX "Aging Airplanes Records Reviews and Inspections," now retitled "Aging Airplane Inspections and Records Reviews" and revised to reflect the final rule, is being made available for additional comment. This revised draft AC will provide guidance pertaining to aging airplane inspections and records reviews to be accomplished to satisfy the requirements of the final rule "Aging Airplane Safety". The FAA has issued concurrently with this final rule a notice of availability for draft AC 120-XX seeking substantive comments.

Additionally, the FAA considers that draft AC 91-56B, "Continuing Structural Integrity Program for Airplanes," and draft AC 91-60A, "The Continued Airworthiness of Older Airplanes," are appropriate to the requirements of this

final rule. The FAA therefore also has issued concurrently with this final rule notices of availability for proposed AC 91-56B and AC 91-60A. The public will be afforded the opportunity to comment on the revisions contained in these proposed ACs.

The FAA revised AC 91-56A, "Continuing Structural Integrity Program for Large Transport Category Airplanes," to AC 91-56B, "Continuing Structural Integrity Program for Airplanes." This revised AC will provide guidance for operators of the airplanes affected by this final rule on how to incorporate an FAA-approved Aging Aircraft Program into their FAA-approved maintenance or inspection program.

Traditionally, AC 91-56 and AC 91-56A have provided guidance to operators of large transport category airplanes on how to develop a damage-tolerance-based SSIP, which was contained in appendix 1 to the AC. The FAA determined that the guidance provided in appendix 1 to AC 91-56A is applicable to small transport category airplanes as well as to large transport category airplanes.

AC 91-56B

Advisory Circular 91-56 and AC 91-56A only considered the effects of repairs and modifications approved by the type certificate holder, and the effects of repairs and modifications performed by operators on individual airplanes. Appendix 1 to AC 91-56B has been expanded to take into consideration the effect of all major repairs,

major alterations, and modifications approved by the type certificate holder.

In addition, proposed appendix 1 to AC 91-56B includes an expanded discussion on repairs, alterations, and modifications to take into consideration all major repairs and operator-approved alterations and modifications on individual airplanes.

AC 91-56B also gives a brief description of the current Mandatory Modifications Program, CPCP, and Repair Assessment Program. The AC also states that the "Evaluation for Widespread Fatigue Damage" will be the subject of a future rulemaking activity.

AC 91-60A

Like AC 91-56A, AC 91-60 provides guidance for operators of the airplanes affected by this final rule on how to develop a service-history-based maintenance or inspection program. AC 91-60 has been updated in AC 91-60A to reflect current maintenance and inspection practices and to be consistent with the acceptable methods of compliance for this final rule.

Other Guidance

The FAA also will develop additional guidance and training material for FAA Aviation Safety Inspectors (ASIs), and representatives of the Administrator authorized to conduct the inspections and records reviews specified in this rule prior to the conduct of those inspections and reviews.

Significant Changes

Based on the comments received the FAA made several significant changes to the proposed rule language in Notice No. 99-02. The revised rule language is part of this final rule.

The FAA extended the repeat inspection and records review interval from 5 years to 7 years to allow operators to align inspection and records review intervals more closely with scheduled HMC intervals.

Also, while Notice No. 99-02 specified that inspections should be established for affected airplanes using damage tolerance techniques, this final rule adds an exception for multiengine airplanes initially certificated with nine or fewer passenger seats and operated under part 129 and part 135 scheduled operations. The requirement to keep flight cycles has been removed. Those airplanes can have a service-history-based SSIP instead of a damage-tolerance-based SSIP.

In addition, the FAA extended the 3-year requirement for initial inspections on airplanes over 24 years old to 4 years. This will provide the FAA with additional time to develop guidance and training material for designees and FAA inspectors.

Finally, the FAA has decided not to apply this final rule to airplanes operated by a certificate holder between any point within the State of Alaska and any other point within the State of Alaska.

Discussion of Comments

A total of 63 commenters submitted 247 comments to Docket No. FAA-1999-5401. Commenters generally opposed the proposal; they submitted 131 comments against the proposed rule and 16 comments in support of the changes. In addition, 100 comments either included supplementary information or did not clearly argue for or against the proposed rule. A discussion of comments submitted, organized by issue, follows.

Statutory Requirements

Section 44717 of 49 U.S.C. requires the following actions:

- The Administrator must "prescribe regulations that ensure the continuing airworthiness of aging aircraft."
- The Administrator must "make inspections, and review the maintenance and other records, of each aircraft an air carrier uses to provide air transportation." These inspections and reviews "shall be carried out as part of each HMC of the aircraft conducted after the 14th year in which the aircraft has been in service."
- Each air carrier must "demonstrate to the Administrator, as part of the inspection, that maintenance of the aircraft's age-sensitive parts

and components has been adequate and timely enough to ensure the highest degree of safety."

- Each air carrier must make its aircraft, as well as any records about the aircraft that the Administrator may require to carry out the review, available for inspection as necessary to comply with the rule issued by the Administrator.
- The regulations must establish procedures to be followed for carrying out such an inspection.

Applicable Airplane Types

Comments: Some commenters indicate the NPRM addresses more airplane types than the AASA intended to address. Because the AASA specifies inspections and reviews must be carried out as part of each HMC of an airplane and light airplanes do not undergo HMCs, the National Air Transportation Association (NATA) asserts the AASA was not intended to address light airplanes. The NATA further contends the proposal disregards the unique inspection programs of light airplanes, and claims the FAA has not found deficiencies in those programs. Also according to the NATA, the FAA has not proven through inspections, maintenance reviews, or research that light airplanes are unsafe. Accordingly, the NATA states that the FAA is not justified in requiring small businesses that operate light airplanes to invest large sums of money in developing and implementing an inspection program intended for larger

airplanes. The State of Alaska Department of Transportation and Public Facilities (ADOT&PF) agrees with the NATA's position.

FAA Response: The FAA disagrees. The AASA does not specifically address types of aircraft. It applies to "each aircraft an air carrier uses to provide air transportation." This includes all air carriers, including smaller operators who conduct commuter operations, regardless of the size of the airplane. However, in response to commenters' concerns, the FAA is revising the provisions of the rule pertaining to the imposition of requirements for supplemental inspection programs. The final rule permits relief from the requirement for all affected airplanes to have damage-tolerance-based inspections and procedures in their aircraft maintenance and inspection programs. All multiengine airplanes initially certificated with nine or fewer passenger seats may have service-history-based SSIPs instead of damage-tolerance-based inspections and procedures. These regulations will be implemented in 2010. Service-history-based SSIPs are estimated to cost significantly less than damage-tolerance-based SSIPs to develop and implement. In addition, airplanes operating between any point within the State of Alaska and any other point within the State of Alaska are exempt from the requirements of this final rule.

U.S. Military Airplanes

Comments: Many commenters question which types of airplanes or operations would be affected by the proposal. One commenter asks whether the proposal would apply to U.S. Air Force commercial derivative airplanes (that is, Boeing 737 airplanes operated by the U.S. Air Force). The commenter notes the Air Force requires Boeing to comply with FAA directives and rules on those derivative airplanes. Another commenter asks whether the proposal would apply to Boeing 757 executive airplanes (military C-32 program).

FAA Response: This final rule only applies to specified airplanes operating under parts 121, 129, and 135. Aircraft that are not U.S.-registered and operated by the U.S. military are not required to comply with the provisions of this rule. However, any U.S.-registered aircraft operating under part 121, 129, or 135 is subject to the requirements of the rule, regardless of the status of its operator.

Imported Older Airplanes

Comments: One commenter questions how the proposal would affect requirements for imported airplanes older than 14 years. The commenter notes 44 countries have safety standards for imported airplanes and the United States is not among those countries. According to the commenter, the 100-hour inspection (appendix D to 14 CFR part 43) is the closest the United States comes to having such a

requirement, but most DARs and many FAA regions ignore this requirement.

FAA Response: The FAA disagrees. The proposal was intended to bring airplanes under the Aging Airplane Program after the effective date of the rule. Therefore, with respect to the requirements of this rule, an imported airplane brought into operation under part 121, 129, or 135 will not differ from an airplane used domestically under 14 CFR part 91 and brought into operation under parts 121, 129, or 135; each airplane will have to be brought under the appropriate maintenance or inspection program and undergo the applicable aging airplane inspections and records reviews prior to being operated under those parts. Additionally, any airplane, domestic or imported, that does not have a supplemental inspection program that meets the requirements of this rule will not be eligible for air carrier operations after the dates specified in this rule.

Applicable Operations

Comments: The Alaska Air Carriers Association (AACA) opposes the proposal and states it should be withdrawn. According to the AACA, the NPRM could lead to the end of scheduled turbopropeller commuter airline growth in Alaska and force a return to the use of out-of-production, piston-powered, single-engine airplane operations in rural Alaska. The AACA contends this proposal would force air carriers that have reached the financial and operational thresholds of using larger, turbine-powered equipment to pay a

"compliance penalty" to operate that equipment. Additionally, the AACA contends many of Alaska's rural communities would experience decreased air service and increased costs of living, and be forced to accept travel in smaller airplanes known to have six times more accidents than twin-engine airplanes used currently.

The AACA notes the FAA has implemented numerous significant regulatory changes during the past 15 years (for example, the "Commuter Rule"), but the aviation safety record in Alaska has not changed significantly, despite the high costs.

According to the AACA, some additional safety measures are necessary. However, the AACA states measures in Alaska should include (1) restoring the previous high levels of service from Flight Service Stations; (2) improving aviation weather reporting, forecasting, information distribution, and air-to-ground communications facilities; and (3) developing additional navigational aids and approach procedures to allow instrument flight rules flight and airport runway, ramp, and apron improvements.

As an alternative to the proposal, the AACA states it would develop an FAA-approved program to accommodate the additional safety intent of the rule, addressing safety as well as the operational limitations unique to Alaska. The program would provide guidance, through development of a customized and comprehensive training program for regularly scheduled maintenance and inspection procedures. To ensure

compliance with this initiative, the program would include an independent audit element and be made available to all members of the AACA, as a function of the AACA Safety and Resource Center.

The State of Alaska Department of Transportation and Public Facilities (ADOT&PF) noted that "this NPRM, over the next ten years has the potential to effectively economically shut down multiple aircraft operators in Alaska." The ADOT&PF further stated that the number of aircraft impacted is nearly 100 percent of the twin-engine aircraft fleet servicing Alaska aviation needs. These comments were echoed by a number of Alaska operators that stated that implementation of the NPRM would result in the "termination" of their operations and that "the nature of the rural transportation infrastructure in Alaska requires relief from these requirements."

According to the NATA, the proposal would substantially affect interstate commerce in many areas, including Nevada, Arizona, New England, and the southeastern United States. Also, the NATA asserts this proposal may cripple the majority of the State of Alaska's transportation network.

FAA Response: The FAA has received numerous comments noting the possible effect of the proposal on intrastate aviation in Alaska. The FAA notes however that the proposal would not apply to aircraft operated by a certificate holder in on-demand or cargo-only operations conducted under part 135. This exclusion remains in the final rule.

The FAA also recognizes that the AASA does not specifically mandate the supplemental inspections proposed in Notice 99-02 and set forth in this rule. However, the FAA clearly is within its authority to require such inspection programs under its broad mandate to promote safety as set forth in 49 U.S.C. 44701.

The FAA also notes that Congress, both in the Federal Aviation Reauthorization Act of 1996 (Public Law 104-264) and in the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181), required the Administrator "in amending Title 14, Code of Federal Regulations, in a manner affecting intrastate aviation in Alaska ... to consider the extent to which Alaska is not served by transportation modes other than aviation and ... establish such regulatory distinctions the Administrator considers appropriate." Section 40113 of 49 U.S.C. was amended to effectuate this provision.

In view of the clear Congressional mandate for the FAA to consider the unique role of aviation in providing transportation within the State of Alaska and the possible loss of critical air services to rural communities within the State, the FAA has revised the proposal. The final rule will not apply to aircraft operated by certificate holders between any point within the State of Alaska and any other point within the State of Alaska.

Regulatory Activity Since 1991 and Recordkeeping

Comments: One commenter states that the proposal seems to disregard all regulatory activity since 1991 that addresses aging airplanes, as well as existing recordkeeping requirements to show compliance with such aging airplane activity.

FAA Response: The FAA disagrees. The FAA has taken into account relevant regulatory activity since 1991 in the development of this rule, such as CPCPs, structural modification programs, the repair assessment rule, and SSIPs. In spite of these regulatory activities, we continue to believe the additional inspections and records reviews are warranted to ensure age-sensitive parts and components are maintained.

Inspections and Records Reviews

Comments: Some commenters state the proposal does not meet the intent of the AASA. According to the Air Transport Association of America (ATA), FAA requirements exceed AASA requirements in the proposal by requiring an unsegmented simultaneous review of each affected airplane and its records. The ATA also notes the AASA does not require the FAA to establish how often airplane inspections and records reviews must be conducted. The Regional Airline Association (RAA) agrees with the ATA and further asserts that the AASA is not intended to disrupt an air carrier's maintenance program, but the FAA proposal certainly would

force air carriers to change their programs at considerable cost.

FAA Response: To minimize cost, operators who have segmented maintenance programs, progressive inspection programs, or approved aircraft inspection programs (AAIPs) should work with their principal maintenance inspector (PMI) or DAR to agree on which inspection examines the largest portion of the airplane. The operator can make the airplane available to the FAA during that inspection to ensure the inspection and records review required by this rule is complied with in a comprehensive, efficient, and cost effective manner. However, the operator using a segmented maintenance program, progressive inspection program, or AAIP must recognize that the PMI or DAR conducting the inspection may require additional areas of the airplane to be open and available for inspection at the discretion of the FAA.

As mentioned previously, the FAA has changed the inspection and records review interval from 5 years to 7 years to allow operators to align their aircraft inspection and records review intervals more closely with scheduled HMC intervals.

Damage-Tolerance-Based Inspection Techniques

Comments: The General Aviation Manufacturer's Association (GAMA) contends that the AASA does not direct the FAA to specify damage tolerance analysis and inspection techniques as the only acceptable method for ensuring the

continued airworthiness of aging airplane structural designs certificated before such techniques were available. The GAMA states there are other methods that have been developed in conjunction with the FAA and industry that are based on structural fatigue analysis, fatigue tests, and field experience correlation, where applicable.

FAA Response: The FAA agrees that the AASA does not specifically require the FAA to mandate the use of damage-tolerance-based inspection techniques. However, 49 U.S.C. 44717 states that the Administrator "shall prescribe regulations that ensure the continuing airworthiness of aging aircraft" and that the Administrator shall make the necessary inspections "that the Administrator decides may be necessary to enable the Administrator to decide whether the aircraft is in safe condition."

The FAA recognizes that there was a collaborative effort based on the use of structural fatigue analysis, fatigue tests, and field experience correlation to develop appropriate inspections and procedures to ensure the continuing airworthiness of aging aircraft. The FAA, however, has determined that except for those multiengine airplanes initially certificated with nine or fewer passenger seats operated under part 129 or used in scheduled operations under part 135, these inspections and procedures should be established using damage-tolerance-based techniques. Those multiengine airplanes initially certificated with nine or fewer passenger seats can use

inspection programs that include service-history-based inspections and procedures instead of damage-tolerance-based inspections and procedures.

Requirements Beyond The Scope of The AASA

Comments: The ATA states the proposal goes beyond inspections and records reviews by supplementing airplane type design and requiring that airplanes meet certification requirements developed quite recently. According to the ATA, if necessary, the proposal should be framed as an AD, and "manufacturers" should be required to adapt their maintenance programs. According to the ATA, "manufacturers" are in a better position than operators to have the design data and service history required to modify their programs.

FAA Response: The FAA agrees that the rule, in certain aspects, exceeds the AASA's mandate to conduct inspections and records reviews. The AASA requires an initial inspection as part of each HMC of the aircraft conducted after the beginning of an airplane's 14th year in service, and thereafter at each HMC. It does not establish specific inspection intervals based on calendar time nor does it mandate the requirement for an operator to include specific supplemental inspection procedures in an aircraft's maintenance program.

Yet, as stated in the preamble to the NPRM and in keeping with the AASA's mandate to ensure the continuing airworthiness of aging aircraft, the FAA considered options

for setting repeat inspection intervals. The FAA reviewed the variables used in establishing the parameters used by operators to carry out scheduled maintenance requirements such as flight hours, calendar time, or a combination of both. The FAA also considered the phasing and segmenting of HMCs and found that the intervals varied from 1 to 27 years. Therefore, the FAA chose to establish a fixed repeat inspection interval.

The FAA realizes that the repeat inspections established in this final rule may not be consistent with current operator maintenance schedules. However, the FAA notes that the ATA itself, in memorandum 96-AE-014, dated March 11, 1996, recommended that "a 'C' check compliance period (18 months) or 'D' check period (5 years) be adopted for all rules unless it can be shown that a shorter time interval is required for safety reasons." The FAA, in keeping with the AASA's mandate, established a repeat inspection interval as part of this final rule.

The FAA does not agree that ADs should be used to implement the new requirements. The FAA is not issuing this rule to address an unsafe condition. This rule is to ensure the continuing structural airworthiness of air carrier aircraft as they continue in service. Also, this rule will allow operators the flexibility to adjust their maintenance or inspection program based on service history and design review.

Furthermore, applying the AASA requirements to all airplanes, regardless of operation, would go significantly beyond the mandate of the act, which requires the Administrator to issue a rule requiring an inspection and records review of each aircraft used in air transportation for compliance with aging aircraft requirements.

Using operational rules (parts 121, 129, and 135) to mandate inspections, supplemental inspections, and records reviews is compatible with what the FAA has done with other maintenance and inspection programs, such as those specified in the final rule entitled, "Repair Assessments for Pressurized Fuselages," which was published in the Federal Register on April 25, 2000 (65 FR 24108). It also corresponds more closely to the intent Congress specified in the applicability of the AASA.

Inspections

Summary of Proposal/Issue: The purpose of the proposal was to verify that each operator can demonstrate it has accomplished all required maintenance tasks, including the damage-tolerance-based SSIPs proposed in the NPRM. The AASA specifies that the inspections and records reviews be carried out as part of each airplane's HMC after the 14th year in service. The NPRM divides airplanes into three categories for these inspections to ensure the oldest airplanes are inspected first. The NPRM also proposes that all aging airplane inspections and records reviews be repeated at specified intervals. However, the

proposal includes a provision for extending the thresholds and intervals to accommodate unforeseen scheduling conflicts.

The NPRM also requires operators to notify the FAA within a specific time period before an airplane is available for an inspection and records review.

Existing Maintenance Programs Make the Rule Redundant

Comments: Most commenters believe the requirement to accomplish inspections and records reviews is redundant. One operator asserts "every air carrier" already has a continuous airworthiness program and an FAA-approved maintenance program, which include corrosion prevention, corrosion control, and damage-tolerance-based SSIPs. Also, that operator believes "every" carrier also must have a Continuing Analysis and Surveillance System (CASS) and must analyze structural defects for their approved maintenance reliability programs for principal structural elements. The commenter notes the regulation and oversight of maintenance programs is a daily FAA requirement. The ATA notes FAA Certificate Management Offices are responsible for overseeing an air carrier's Continuous Airworthiness Maintenance Program (CAMP) and CASS and ensuring an air carrier's airplanes are operated and maintained according to FAA regulations and the air carrier's operations specifications. The ATA notes these responsibilities do not begin only after an airplane has been in service for 14 years. Furthermore, the RAA

emphasizes that the FAA has complete authority to determine whether an operator has deficiencies in its maintenance program.

One commenter states that the FAA should revise the proposal to compensate for existing maintenance programs that address aging airplane concerns. For example, the 14-year in-service threshold should be increased to 20 years to coincide with the Aging System Task Force definition, which established "20 years since an airplane's certification" as the nominal age threshold. Another commenter states that the FAA should provide special consideration for low-utilization airplanes that may have more than 14 years of total service. A third commenter states the proposed inspections should be associated with the renewal or continued effectiveness of "an airline's standard airworthiness certificate" and should include all phases of continued airworthiness in addition to aging airplane considerations. However, that commenter questions the reason for a 14-year time period. The Air Line Pilots Association (ALPA), however, supports proposed inspections for airplanes after 14 years in service.

FAA Response: The requirements to accomplish inspections and records reviews stem directly from the AASA, which states, in part, that the FAA shall prescribe regulations that:

"at a minimum, require the Administrator to make such inspections, and conduct such reviews of maintenance

and other records, of each aircraft used by an air carrier to provide air transportation as may be necessary to enable the Administrator to determine that such aircraft is in safe condition and properly maintained for operation in air transportation."

In addition, the AASA specifies that inspections and records reviews "shall be carried out as part of each heavy maintenance check of the aircraft conducted after the 14th year in which the aircraft has been in service."

Differences Between Current and New Inspections and Records Reviews

Comments: Several commenters are uncertain how the proposed inspections and records reviews would differ from those currently conducted by ASIs. The ATA notes that § 121.153(a) currently requires airplanes to be maintained in an airworthy condition, which would include compliance with any mandated aging airplane requirements. Also, some commenters contend this proposal represents a shift of responsibility from air carriers to the FAA in ensuring airplane airworthiness. These commenters state they are uncertain why the FAA desires such a shift.

Another commenter recommends that the FAA allow an air carrier's quality assurance department to conduct the proposed inspections and records reviews when an FAA representative is unavailable. ALPA supports the proposal, which would permit certain representatives of the Administrator to conduct inspections.

FAA Response: Section 44717(b)(2) 49 U.S.C. states that the aging aircraft inspections "*shall* be carried out as provided under [49 U.S.C.] § 44701(a)(2)(B) and (C)..." (emphasis added). Section 44701(a) reads as follows:

> (a) The Administrator of the Federal Aviation Administration shall promote safe flight of civil aircraft in air commerce by prescribing...
>
> (2) regulations and minimum standards in the interest of safety for...
>
> (B) equipment and facilities for, and the timing and manner of, the inspecting, servicing, and overhauling (of aircraft, aircraft engines, propellers, and appliances); and
>
> (C) a qualified private person, instead of an officer or employee of the Administrator, to examine and report on the inspecting, servicing and overhauling.

Section 44717(b)(2) was added in 1994 as part of the recodification of the FAA's enabling legislation. The AASA and the recodified § 44717(a)(1) require the Administrator to make the aging airplane inspections.

The rules prescribed by the Administrator under § 44701(a)(2)(B) establish regulations and minimum standards for many different activities by nongovernment persons, including air carrier maintenance organizations and repair stations. Section 44701(a)(2)(C) requires the Administrator

to establish regulations and minimum standards for qualified private persons who examine and report on inspecting, servicing, and overhauling. It does not address the delegation of authority to act on behalf of the Administrator nor does it describe persons who act on behalf of the Administrator. A certificate holder and its employees are not employees of the Administrator, nor are they necessarily representatives of the Administrator in accordance with § 44702(d).

Congress clearly intended that the Administrator would determine "whether an aircraft is in safe condition and maintained properly for operation in air transportation." This is evident in § 44717(a)(1), which requires the Administrator to perform the inspections and records reviews. It also is consistent with the legislative history of the AASA. The FAA notes, however, the AASA was never intended to relieve the operator from the responsibility for the airworthiness of the aircraft as described in current § 121.363, § 129.14 (ICAO Annex 6, Chapter 8), or § 135.413. There is no language in § 44717 that implies that operators are to be relieved of compliance with regulations issued under § 44701.

Furthermore, the FAA notes that the text of the AASA, and the recodification thereof, instructs the Administrator to establish a program to provide FAA inspectors and engineers with the necessary training to conduct auditing inspections of airplanes operated by air carriers for

corrosion and metal fatigue (see § 44717(c)(2)(A)). If it had been the intent of Congress to have private persons make those inspections instead of FAA employees (or perhaps designees), that text would have been changed.

The above interpretation is also consistent with the general position that the recodification of the FAA's enabling act was not intended to change the substantive law.

Given the extensiveness of the scope and quantity of airplane inspections required by § 44717(a)(1), the Administrator could still elect to use "a qualified private person" to conduct those inspections and records reviews under a delegation of authority. Hence, the FAA intends to use DARs to help in conducting the inspections and records reviews required by § 44717(a)(1). Such action is consistent with the act and gives meaning to the provisions of 49 U.S.C. 44717(b)(2) in its context. This interpretation also gives meaning to "qualified private person" in the context of implementing the Aging Airplane Program.

Incompatibilities Between Current Practices and the Proposal

Comments: One commenter emphasizes that current regulations do not allow a used airplane to be placed on an operator's certificate until its records have been reviewed by the Administrator. Another commenter notes a complete records review is not possible for some airplanes because the history of those airplanes has not been maintained. Yet

another commenter asserts compliance with current FAA-scheduled maintenance program requirements along with FAA verification of records accuracy on a routine interval is a more logical approach than that presented in the proposal.

FAA Response: The FAA disagrees. Section 44717, 49 U.S.C. states that the FAA-

> "shall prescribe regulations that ensure the continuing airworthiness of aging aircraft" and that the Administrator shall "make the inspections, and review the maintenance and other records of each aircraft an air carrier uses to provide air transportation that the Administrator decides may be necessary to enable the Administrator to decide whether the aircraft is in safe condition."

The statute further specifies that these regulations shall-

> "require an air carrier to demonstrate to the Administrator, as part of the inspection, that maintenance of the airplane's age-sensitive parts and components has been adequate and timely enough to ensure the highest degree of safety."

The alternate courses of action described by commenters, including existing practices, do not relieve the FAA of its obligations under the statute.

Burdens of Proposed Inspection Intervals

Comments: Many commenters assert the proposal is burdensome to operators and the FAA. The ATA states the proposal for inspections at 5-year intervals is contrary to the intent of the AASA and would require air carriers to redefine their maintenance programs to match the 5-year intervals. According to the ATA, the FAA may be exceeding its mandate if this requirement is implemented. Several commenters support the ATA's position stating that the FAA should revise the proposal so inspection intervals align with operator maintenance programs. One commenter asserts the first inspection after the rule becomes effective should be required 5 years from the rule's effective date or during the next HMC, whichever is later, regardless of the age of the airplane.

The ATA asserts that the inspection interval requirement would subject carriers to disruptions if the FAA fails to provide the air carrier with timely notice that the aging airplane inspections and records reviews have been completed. The proposal states that the FAA may take an airplane out of service before analyzing the results of an aging airplane inspection and records review.

FAA Response: The FAA recognizes that the AASA does not establish specific repeat inspection intervals based on calendar time. However, because of the wide variances in HMC intervals and maintenance programs, the FAA chose to establish a fixed repeat interval. The FAA notes that HMC intervals vary greatly among operators. Operators have

segmented maintenance programs, progressive inspection programs, or approved aircraft inspection programs that do not easily lend themselves to the use of HMC intervals for the conduct of the mandated inspections and records reviews.

Even though the AASA requires an initial inspection as part of each HMC after the beginning of an airplane's 14th year in service, and thereafter at each HMC, the FAA believes that an inspection interval based on calendar time is consistent with the AASA. A fixed repeat interval is consistent with the intent of the AASA that requires the Administrator to "assure the continuing airworthiness of aging aircraft." The repeat intervals established in the rule will allow the Administrator to ensure that "each aircraft used by an air carrier to provide air transportation is in a safe condition and properly maintained for operation in air transportation."

As previously noted, the ATA recommended, in memorandum 96-AE-014, dated March 11, 1996, that "a 'C' check compliance period (18 months) or 'D' check period (5 years) be adopted for all rules unless it can be shown that a shorter time interval is required for safety reasons." The FAA, in keeping with the AASA's mandate, established a repeat inspection interval as part of this final rule that is consistent with this recommendation.

The FAA realizes that the repeat inspection intervals established in this final rule may not be consistent with current operator maintenance schedules. Therefore, based on

the comments received, the FAA has changed the proposed 5-year repeat interval to a 7-year interval to be more compatible with air carriers' HMCs.

In addition, the FAA extended the 3-year requirement for initial inspections on airplanes over 24 years old to 4 years to provide the FAA with additional time to develop guidance and training material for designees and FAA inspectors.

Ninety-Day Reporting Requirement

Comments: The ATA believes the FAA should modify the proposal to allow 90 days for an operator to provide a report to the Administrator on findings and conclusions related to aging airplane effects from an HMC and the maintenance activities in the interval since that HMC. Additionally, the ATA recommends the FAA provide a similar 90-day timeframe during which the FAA would be required to provide an operator with written acknowledgment of such a report and a determination of the FAA's acceptability.

One ATA member suggests that an operator submit a summary report, for like airplanes in the air carrier's fleet, of findings and conclusions related to aging airplane effects from the HMC and the maintenance activities in the interval since that HMC within 60 days of each 90-day period. According to this ATA member, quarterly summary reports can depict trends more easily than individual airplane check reports.

FAA Response: The FAA agrees that submission of a 90-day inspection and records review report would be a beneficial practice. This should be agreed to between each operator and its PMI. However, because this would add a burden to operators and was not required by the AASA, such a report will not be added to the final rule but will be an acceptable option to assist operators in demonstrating compliance with the provisions of this rule.

Accomplishment of Records Reviews and Inspections

Comments: One commenter asserts the proposal could result in enormous costs to operators if ASIs or DARs fail to make inspections and reviews in a timely manner. Also, the RAA states that the proposal that an air carrier cannot operate its airplanes until inspections and records reviews are completed is excessive. The RAA is particularly concerned about such a case in which the lack of personnel to conduct an inspection and records review causes grounding of an airplane. Other commenters question the FAA's ability to conduct or train representatives to perform the proposed inspections and reviews. One commenter states that the FAA should consider an alternative to the inspections and records reviews that would have an ASI or DAR at an air carrier's facility each night a carrier conducts a scheduled segmented inspection.

FAA Response: The FAA acknowledges the commenter's concerns. To ensure rapid implementation of the inspections

and records reviews, this final rule includes provisions to allow for DARs to perform those required inspections and reviews. The FAA anticipates that there will be an increased demand for DARs as a result. In the short run, this may create problems with the availability of DARs, given their current supply and the time it takes for an individual to become a DAR. Over time, it will be possible for qualified individuals to become DARs and fill the demand. Additionally, the FAA will not require operators of affected aircraft to immediately comply with the inspections and records reviews after the effective date of the rule. Significant multi-year implementation periods have been provided in the rule to ensure sufficient trained personnel will be available to accomplish the inspections and reviews without disruption to certificate holders' operations. As a result, the industry's needs will be met and operators will be able to comply with the requirements of the AASA in a timely manner.

Also, operators should be aware that while this final rule imposes restrictions on airplanes operating under parts 121, 129, and 135 until the required inspections and records reviews have been accomplished, it does not affect any part 91 operations conducted by part 121, 129, and 135 air carriers, such as training or positioning flights.

Regarding the comment on the effects of the rule and the FAA's workload, the FAA is committed to train a group of inspectors and DARs to perform the inspections and records

reviews required by this final rule. The FAA will also monitor the performance of those inspectors and DARs.

Each operator should plan each inspection and records review and schedule it with the appropriate ASI or DAR. The ASI/DAR inspection and records review should normally follow the inspection by maintenance personnel. However, if an unforeseen scheduling conflict occurs, the final rule permits a 90-day extension to accomplish the inspection and records review. An unforeseen scheduling conflict may arise, for example, if an operator finds that the hangar space dedicated for the incoming aircraft is not available because of additional work required on the aircraft currently in the hangar. The Administrator may approve an extension of up to 90 days, provided the operator presents to the PMI written justification for the scheduling conflict. Also, the FAA will accept electronic, facsimile, or other forms of notification. The request for an extension should provide the PMI ample opportunity to respond to the operator's request.

Single Airplane Versus Fleets

Comments: Several operators note the proposal would require review of airplanes on an individual basis rather than as a fleet. These operators strongly oppose the proposal, indicating the process would be too expensive, time-consuming, and unlikely to increase airplane safety. According to these operators, most audit programs sample the fleet and require additional review only when problems are

discovered. One commenter recommends that the FAA implement a fleet sampling program beginning with the oldest airplanes in a fleet type, with inspections every 5 years on a different airplane within that fleet. Another commenter recommends the FAA allow air carriers to complete these remaining airplane inspections and records reviews.

FAA Response: The FAA disagrees. The AASA states that each airplane that has exceeded its 14th year in service should have an inspection and records review to determine the adequacy and timeliness of the maintenance of the aircraft's age-sensitive parts and components. Therefore, fleet audit programs do not meet the Congressional mandate and are not suitable.

The FAA again notes that the proposed 5-year interval has been changed to a 7-year interval to be more compatible with the air carriers' HMCs. However, with respect to air carriers completing inspections and records reviews, the AASA states specifically that the Administrator must accomplish the required inspections and records reviews.

The FAA recognizes that operators will incur additional expenses as a result of this rule. The FAA has therefore worked to minimize the cost. Affected airplanes initially certificated with nine or fewer passenger seats have been allowed to have incorporated into their inspection program service-history-based SSIPs instead of damage-tolerance-based SSIPs. Additionally, provisions that allow for delayed compliance until 2010 of

certain airplanes with damage-tolerance-based and service-history-based inspection programs have also been included in the rule.

Limiting Inspection Scope

Comments: The ATA recommends requiring only that portion of an airplane scheduled for detailed maintenance and repair at an HMC after the 14th year of service be made available along with corresponding records. According to the ATA, this revision of the proposal would allow the air carrier to demonstrate the adequacy and timeliness of its continuous maintenance and surveillance programs and other aging airplane programs without having to examine every part, component, or record of an airplane.

FAA Response: The FAA agrees in part. As stated in the NPRM-

> "Although it is the FAA's intent to carry out records reviews and inspections to the extent that the aircraft structure is accessible during the HMC maintenance visit, the FAA may require additional access to determine that the maintenance of the airplane's age-sensitive parts and components has been adequate and timely."

The FAA expects the air carrier to identify the most comprehensive HMC within the interval identified in the rule as the time for the conduct of the inspections and records reviews.

The intent of the final rule is that aging airplane inspection and records reviews should be concurrent with the HMC maintenance being accomplished on each airplane and the FAA has revised the rule to facilitate this action.

Access to Airplane Structure

Comments: Many commenters express concern about allowing an ASI or DAR access to areas of inspected airplanes that may not be opened during HMCs to determine whether the airplanes meet the requirements of the NPRM. These commenters question what criteria would be used to determine whether such additional access is required. The ATA contends if additional access is required, it should be negotiated in advance with the air carrier or mandated under existing authority without signaling ASIs or DARs that they should be opening additional areas at all HMCs.

FAA Response: The FAA disagrees. It is not the FAA's intent to disrupt operators' scheduled maintenance in such a way that it would impact their schedules. However, each airplane subject to the final rule cannot be returned to service until the Administrator or a designee has completed its inspection and records review and notifies the operator accordingly. The FAA agrees that it would behoove the operator to schedule these inspections with the ASI or DAR well in advance of scheduled maintenance visits; however, the FAA does not intend to limit its access to those areas

inspected under the provisions of the operator's appropriate maintenance or inspection program.

Although it is the FAA's intent to carry out the inspections and records reviews to the extent that the airplane structure is accessible during the maintenance visit, at the discretion of the ASI or DAR, the FAA may require additional access to confirm that the maintenance of the airplane's age-sensitive parts and components has been adequate and timely as required by the AASA.

Acceptable Records

Comments: The ATA states that conflicts would undoubtedly arise when an airplane is inspected and the records for that airplane are located elsewhere. The ATA asserts an air carrier should not be required to move the airplane or its records in such cases. Several commenters agree with the ATA's position. According to the ATA, the FAA should allow for the use of electronic or other copies of records. Also, the ATA states that the FAA should allow for the use of a summary of maintenance actions in place of original airplane records, to focus on aging effects rather than recordkeeping compliance. The Aerospace Industries Association of America, Inc. (AIAA), opposes the potential need to maintain a duplicate set of records. The AIAA further contends that reliance on automated records is inadequate, even though it may help ensure consistency in format.

FAA Response: The FAA agrees with commenters that these are legitimate issues related to airplane records. The FAA recognizes that airplanes subject to this rule are maintained at FAA-approved repair stations throughout the world. It would place an undue burden on the air carrier or operator to provide original maintenance records that are kept at their main base. Therefore, the FAA will accept a status summary of maintenance actions in lieu of original airplane records provided the status summary meets the requirements of the rule. Also, the FAA will accept electronic, facsimile, or other copies of airplane records as long as the information is accurate and complete. These details should be coordinated individually with each ASI or DAR.

Sixty-Day Notification Requirement

Comments: Several commenters object to the requirement that an air carrier must notify the Administrator 60 days before an airplane and its records are available for review. According to one commenter, although the current proposal increases the advanced notification requirement from 30 days (as set forth in the Aging Airplane Safety NPRM published October 5, 1993 (58 FR 51944)) to 60 days, it does not respond to the original complaints by several commenters that normal surveillance of an operator's fleet would provide the FAA with ample time to find out the details of a carrier's heavy maintenance schedule.

FAA Response: The FAA disagrees. In 1993, the FAA proposed in its Aging Airplane Safety NPRM a 30-day time period to notify the Administrator before an airplane and its records would be available for review. In Notice No. 99-02, the FAA extended this time period to 60 days. The FAA believes that this notification is necessary because notification obtained through normal surveillance of an operator's fleet may be insufficient to ensure the FAA has sufficient time to schedule its resources and minimize the impact on the air carrier.

Ninety-Day Extensions

Comments: One ATA member states the proposed 90-day extension provisions should be open-ended to take into account unforeseen scheduling conflicts of an airplane and possible delays resulting from FAA resource constraints. However, the ATA generally supports the extension provision.

FAA Response: The FAA disagrees and contends that 90 days is a sufficient time period for an operator to resolve an unforeseen scheduling conflict. Operators must therefore plan to account for this requirement. An unforeseen scheduling conflict may arise, for example, if an operator finds that the hangar space dedicated for the incoming aircraft is not available because of additional work required on the aircraft currently in the hangar. The Administrator may approve an extension of up to 90 days, provided the operator presents to the PMI written

justification for the scheduling conflict. Also, the FAA will accept electronic, facsimile, or other forms of notification. The request for an extension should provide the PMI ample opportunity to respond to the operator's request. The 90-day extension provision is adopted as proposed.

Cargo-Modified Airplanes

Comments: According to comments, the FAA should create a separate category of inspections for cargo-modified airplanes to require shorter intervals between their baseline inspection programs, unless the FAA takes into account enough precautions during the supplemental type certificate (STC) substantiation process.

FAA Response: The FAA disagrees. The final rule is applicable to those airplanes modified by cargo conversion STCs. The inspections mandated by the AASA should not be a substitute for routine maintenance. If maintenance is necessary at shorter intervals, the documentation of that maintenance will be a part of the records review.

Definitions

Comments: Commenters state that the FAA should define the term "age-sensitive parts." According to the U.K. Civil Aviation Authority (CAA), other documents, such as AC 25.571-1C, "Damage Tolerance and Fatigue Evaluation of Structure," and AC 91-MA, "Continued Airworthiness of Older Small Transport and Commuter Airplanes; Establishment of

Damage-Tolerance-Based Inspections and Procedures," and many aging initiatives do not define clearly the affected structural parts and the various sources of deterioration.

In addition, commenters suggest that the FAA should define more clearly the difference between a "minor" and a "major" repair or structural alteration, for reporting purposes.

FAA Response: The FAA interprets "age-sensitive parts and components" to mean, for the purpose of this rule, those parts and components of the primary structure of an airplane that are susceptible to fatigue or corrosion.

Minor and major repairs, and structural alterations, are already defined in 14 CFR. Additional definitions would be beyond the scope of the AASA and are not addressed in this final rule.

Recordkeeping Requirements

Summary of Proposal/Issue: The FAA proposes in §§ 121.368(d), 129.33(c), 135.422(d) and 135.422a(d) to require a certificate holder to make certain specific airplane records available to the Administrator for review. These records must contain the following information:

- Total years in service of the airplane;
- Total flight hours of the airframe;
- Total flight cycles of the airframe (not required by §135.422a(d));
- Date of the last inspection and records review;

- Current status of the life-limited parts of the airframe;
- Time since the last overhaul of all structural components required to be overhauled on a specific time basis;
- Current inspection status of the airplane, including the time since the last inspection required by the inspection program under which the airplane is maintained;
- Current status (including the method of compliance) of ADs, the CPCP, and other inspections and procedures required;
- A list of major structural alternations; and
- A report of major structural repairs and the current inspection status of those repairs.

Current Recordkeeping Requirements

Comments: Commenters note most of this information already is required to be maintained by operators under current regulations.

The AIAA states proposed § 121.368(d) duplicates the requirements of current § 121.380. The AIAA further asserts that § 121.380 is more comprehensive than proposed § 121.368(d), particularly regarding ADs. Because most operators of large transport airplanes have developed elaborate maintenance recordkeeping requirements based on § 121.380, the AIAA recommends the FAA revise proposed

§ 121.368(d) to allow compliance with § 121.380 as an alternative.

FAA Response: Airplane records for air carriers operating under part 121 must be maintained under § 121.380. Proposed § 121.368(d) requires retention of certain records that are not part of current § 121.380 or § 121.707, such as airframe flight cycles, total years in service of the airplane, damage-tolerance inspections, and date of last inspection records review. However, there is no restriction on operators using records maintained under current § 121.380 to comply with part of the requirements of § 121.368.

Part 129 Recordkeeping Requirements

Comments: One commenter states the FAA has never established definitive records and documentation requirements and that part 129 operators use documents developed by "listings companies" and airplane owners. The commenter also notes there is no coordination of guidelines among the various FAA regions, and between ASIs and FAA headquarters. Additionally, the commenter notes most "offshore" operators maintain more complete and detailed records systems than U.S. operators; according to the commenter, a main area of weakness is centered around parts and assemblies that have been overhauled by U.S.-based repair stations, which often fail to deliver proper records with parts.

FAA Response: The FAA has established definitive recordkeeping requirements for persons operating aircraft under part 129. As a signatory to the Convention on International Civil Aviation, the United States requires each commercial operator of a U.S.-registered aircraft to maintain that aircraft in accordance with ICAO Annex 6, Part I. Current § 129.14 requires each air carrier and foreign person operating a U.S.-registered aircraft in common carriage to ensure each aircraft is maintained in accordance with a program approved by the Administrator. The FAA approves maintenance programs under § 129.14 that, at a minimum, comply with ICAO Annex 6, Part I. Section 129.33 requires records beyond those required by programs under current § 129.14.

Annex 6, Part I, Standard 8.8, Records, contains recordkeeping requirements, as follows:

(1) 8.8.1. An operator shall ensure that the following records are kept:

a) in respect of the entire aeroplane: the total time in service;

b) in respect of the major components of the aeroplane:

1) the total time in service;

2) the date of the last overhaul;

3) the date of the last inspection;

c) in respect of those instruments and equipment, the serviceability and

operating life of which are determined by their time in service;

1) such records of the time in service as are necessary to determine their serviceability or to compute their operating life;

2) the date of the last inspection.

(2) 8.8.1.1. These records shall be kept for a period of 90 days after the end of the operating life of the unit to which they refer.

Flight Cycles, Landings, and Total Years in Service

Comments: Commenters state that current regulations do not require certificate holders to log flight cycles or landings; therefore, the FAA should specify that tracking this information is a new requirement. Also, the FAA should define "flight cycle" in 14 CFR § 1.1 and develop guidelines for establishing a baseline number of airframe flight cycles if an operator has not been maintaining this information.

In addition, commenters suggest that the FAA publish guidelines to be used in cases where a true determination of total years of service for an airplane is not possible.

FAA Response: Under parts 121 and 129, operators track flight cycles to determine the current status of life-limited parts for each airframe, engine, propeller, and appliance. However, the FAA has revised the part 135

inspection and records review rules for airplanes initially certificated with nine or fewer passenger seats by eliminating the requirement to track total flight cycles on the airframe. The FAA has made this change to the rule because the inspection programs for these aircraft may include service-history-based SSIPs instead of only damage-tolerance-based inspections and procedures. In addition, operators should be able to determine the total number of years in service of an airplane subject to the rule. If the operator cannot determine the total number of years in service of an airplane, the FAA will rely on the date of manufacture of the airplane in question.

Designated Airworthiness Representatives

Summary of Proposal/Issue: Because of the many airplanes that will have to be inspected over a short period of time and the anticipated growth of the aging fleet, the FAA proposed permitting DARs to accomplish the inspections and records reviews required by the rule. Proposed § 183.33(a) expands the authority of DARs to permit them to make findings necessary to determine the continuing effectiveness of airworthiness certificates by conducting the inspections and records reviews required by §§ 121.368, 129.33, 135.422, and 135.422a.

General

Comments: Commenters generally oppose this provision. Several commenters, including the RAA, indicate the FAA is

exceeding the intent of the AASA by delegating inspection authority and responsibility from the FAA to DARs.

FAA Response: The FAA disagrees. The AASA requires the inspections and records reviews to be performed by the Administrator. There is, however, no statutory prohibition on the Administrator delegating the responsibilities specified under the AASA. A DAR is a designee of the FAA and a representative of the Administrator and, therefore, is qualified to accomplish the inspections and records reviews required by this final rule.

Qualifications of DARs

Comments: Several commenters assert that delegating to DARs the responsibility of performing inspections and records reviews is a mistake, because DARs are not qualified to conduct the proposed inspections and records reviews. One commenter notes familiarity with the section of 14 CFR pertinent to records documentation and states that there has never been a requirement for a "DAR certificate."

In addition, several commenters contend a PMI assigned to an operator or an operator's own quality control inspectors may be more qualified to conduct the proposed inspections and records reviews than either an ASI or a DAR not familiar with the operator. The RAA asserts requiring an ASI or DAR to conduct the inspections and records reviews is unprecedented and impractical, and would confuse the FAA's oversight responsibilities with that of an

air carrier's responsibility for the airworthiness of its airplanes. Another commenter states the FAA should specifically and individually test and establish the capabilities of all DARs who are authorized to perform the inspections and reviews as stated in the proposal. Additionally, one commenter recommends that the FAA permit operator designees or Designated Engineering Representatives (DERs), in addition to DARs, to conduct the inspections and records reviews. Finally, one commenter states that under such a system, air carriers should make available to the FAA any and all records and findings necessary for the FAA to evaluate an airplane.

FAA Response: While the AASA allows properly qualified persons to act on behalf of the FAA to conduct inspections and records reviews, the FAA acknowledges that many DARs currently may not be properly trained or qualified to conduct the required inspections and records reviews. The FAA will develop a training program and guidance material to enable DARs to properly accomplish the requirements of this rule. For this reason, initial inspections and records reviews are not required to be completed until a number of years after the effective date of the rule. After the FAA develops the training program and guidance material, ASIs and DARs will be trained and qualified to conduct the inspections and records reviews required by this rule.

Regarding the commenter's reference to air carrier quality control inspectors, they are not representatives of

the FAA and, therefore, would not be eligible to conduct the required inspections and records reviews under the AASA.

However, an operator could facilitate the application of a member of its staff to become a DAR. There is an established procedure on how DARs are appointed, and the FAA does not foresee using a test to make this assessment. The FAA is unsure what the commenter means by the term "operator designees." However, DARs are the only designees allowed to conduct records reviews. Performing such reviews is not within the scope of a DER's delegation.

In response to the commenter's assertion that there has never been a requirement for a "DAR certificate," the FAA notes that a DAR is issued a Certificate of Authority and a Certificate of Designation in accordance with 14 CFR § 183.13.

Lack of FAA Resources

Comments: Many commenters question the FAA's assumptions about its ability to conduct inspections and records reviews. The ATA states its members are concerned that the ASI force, even augmented by DARs, would be insufficient to support the proposed inspections and reviews. According to ATA members, airlines currently find it difficult to hire qualified aircraft maintenance employees and predict a shortage in the near future of qualified ASIs and DARs. These members believe this situation would result in inexperienced ASIs and DARs

conducting the inspections and reviews, and further delays in returning airplanes to service.

FAA Response: The FAA disagrees. The FAA believes that there will be enough ASIs and DARs to accomplish needed inspections and records reviews and has therefore adopted a rule that permits the initial inspections and records reviews to be completed a number of years after the effective date of the rule. As previously stated, the FAA will train a group of inspectors and DARs to perform the inspections and records reviews required by this final rule and subsequently monitor the performance of those inspectors and DARs.

Supplemental Damage-Tolerance-Based Inspections and Procedures

Summary of Proposal/Issue: Supplemental damage-tolerance-based inspections and procedures refer to an "inspection program that specifies the procedures, thresholds, and repeat intervals that have been developed using damage tolerance principles." Damage-tolerance-based inspections and procedures are developed by a type certificate holder or operator based on an engineering evaluation of likely sites where damage could occur, considering expected stress levels, material characteristics, and projected crack growth rates. The damage-tolerance-based inspections and procedures specified in the proposal can be developed using one of the following methods:

- Damage-tolerance-based inspections and procedures that comply with the damage tolerance provisions for metallic structure listed in 14 CFR § 23.573, Amendment 23-45, or subsequent amendments;
- Damage-tolerance-based inspections and procedures that comply with 14 CFR § 25.571, Amendment 25-45, or subsequent amendments;
- Advisory Circular (AC) 91-56, "Supplemental Structural Inspection Program for Large Transport Category Airplanes," or AC 91-56A, "Continuing Structural Integrity Program for Large Transport Category Airplanes"; or
- Any other method the Administrator finds complies with the principles of damage tolerance.

Damage-tolerance-based inspections and procedures may be approved through an amended type certificate or STC process for airplanes certificated under a type certificate and associated amendments dated before those that require damage tolerance as part of airplane type design. Damage-tolerance-based inspections and procedures for certain older airplanes also may be approved by a Letter of Approval issued by the FAA Aircraft Certification Office (ACO) or office of the Small Airplane Directorate or Transport Airplane Directorate having cognizance over the type certificate for the affected airplane.

Also, for some airplanes, the FAA has approved major structural modifications under an STC. The original type certificate holder may not have sufficient technical data pertinent to these modifications to assist the airplane operator in conducting a damage tolerance assessment of the modification. In these situations, the FAA expects the operator to work with the STC holder to develop damage-tolerance-based inspections and procedures for that modification. If necessary, as an alternative, an operator may conduct its own damage tolerance assessments using competent engineering personnel, inspection findings from the current maintenance program, the airplane's design database, and model fleet experience.

General

Comments: One operator asserts the proposal would result in the grounding of approximately 62 percent of the commuter fleet.

FAA Response: The commenter has provided no data to substantiate its claim.

Alternatives to Damage Tolerance

Comments: An Alaskan operator is not opposed to a SSIP that would be implemented in a cost-effective manner through incorporation into the operator's AAIP and developed by either the FAA or the "manufacturer." The commenter states the FAA and "manufacturers" have the competent engineering

staff and access to the relevant design information, while the operators do not.

The RAA notes the FAA fails to reference in the NPRM any technical basis for rejecting the alternative inspection program for smaller airplanes (submitted by the ARAC Small Transport/Commuter Airplane Airworthiness Assurance Working Group (SAAWG)). According to the RAA, damage tolerance analysis may be the most realistic analysis for certain principal structural elements but not necessarily all principal structural elements.

FAA Response: The FAA appreciates the significant efforts of the SAAWG to explore alternative inspection programs for small- and commuter-sized aircraft. Based on the comments received, the FAA has changed the regulation to require damage-tolerance-based SSIPs for affected airplanes initially certificated with 10 or more passenger seats and service-history-based SSIPs for airplanes initially certificated with 9 or fewer passenger seats. Acceptable means of compliance for damage-tolerance-based SSIPs are contained in AC 91-56 and AC 91-56A, and acceptable means of compliance for service-history-based SSIPs are contained in AC 91-60. The FAA is requesting comments on draft AC 91-56B and AC 91-60A. Once these ACs become final, they too will be considered an acceptable means of compliance with this rule.

Nonmandated Supplemental Structural Inspection Programs

Comments: The RAA states that proposed provisions to allow certain airplanes (with AD-mandated SSIPs) to operate until December 20, 2010, without damage tolerance programs discriminates against regional airplane operators with equivalent structural inspection programs not mandated by SSIP ADs.

FAA Response: In this final rule, the FAA allows airplanes initially certificated with nine or fewer passenger seats to have service-history-based SSIPs that will be valid indefinitely. For those airplanes that were initially certificated with 10 or more passenger seats, the FAA expects damage-tolerance-based SSIPs for these aircraft to be completed within 4 years after the effective date of the rule. However, the FAA is delaying implementation of the requirement for damage-tolerance-based inspections with respect to those airplanes with AD-mandated non-damage-tolerance-based SSIPs until December 20, 2010.

Potentially Mandated Supplemental Structural Inspection Programs

Comments: The RAA notes there may be airplane fleet types that are in the process of qualifying for an approved SSIP AD program but that may not be included in the final rule because the program was not complete at the time of publication of the NPRM. According to the RAA, several regional/commuter original equipment manufacturers (OEMs) report that they have submitted "SIPs" to the FAA as early

as 1990, but the FAA has not adopted the ADs to mandate changes to the affected operators' maintenance programs.

The RAA further asserts most airplanes with SSIPs are considerably older than the regional airplane types cited in the NPRM as having damage-tolerance-based "maintenance inspection programs." Although the RAA appreciates the value of SSIPs, the RAA notes that the service experience for demonstrating structural integrity of the affected regional/commuter airplane types without SSIPs has been excellent.

FAA Response: The commenter did not distinguish between damage-tolerance-based SSIPs and service-history-based SSIPs. Those airplanes that have service-history-based SSIPs implemented through ADs will have until December 20, 2010, before they will have to comply with the damage tolerance requirements of this final rule. Those airplanes that do not have a service-history-based SSIP will have to comply with the damage tolerance requirements within 4 years after the effective date of this final rule.

Approval of Damage-Tolerance-Based Supplemental Structural Inspection Programs

Comments: Regarding the FAA's proposal that airplane damage tolerance requirements may be approved through an amended or supplemental type certificate when necessary, one type certificate holder questions whether it is the FAA's intent to require type certificate holders to submit applications (FAA Form 8110-12) for a type certificate

amendment. If so, the type certificate holder warns that ACOs may become overwhelmed, which is a workload situation the FAA failed to consider in its cost-benefit analysis. The type certificate holder also questions whether it is the FAA's intent to modify the type certificate data sheet as a result of incremental changes to type design (as per the definition of an amended type certificate) or as the result of an STC.

FAA Response: The FAA disagrees. The FAA understands that there are many ways to accomplish approved damage-tolerance-based or service-history-based SSIPs, such as amended type certificates, STCs, Letters of Approval issued by the FAA, or service bulletins issued by the type certificate holder and approved by the FAA. However, each operator is ultimately responsible for ensuring each of its airplanes has the appropriate inspection programs for the baseline airplane structure, which is the airplane structure as designed by the original type certificate holder, and each specific major repair, modification, and alteration to the baseline structure.

Regarding the comment on FAA workload, the FAA has considered the effects of the rule on the FAA workload and has concluded that the workload will be within acceptable levels during the implementation period.

Letter of Approval

Comments: The NPRM includes a provision that damage-tolerance-based inspections and procedures for certain older airplanes also may be approved by a Letter of Approval issued by the FAA. The type certificate holder questions whether this process is intended to address damage-tolerance-based inspections and procedures prepared by someone other than the type certificate holder. Also, the type certificate holder requests the FAA clarify whether the letter would be placed in the airworthiness limitations section of an airplane's maintenance manual, in the Airplane Flight Manual, in logbooks, or in another procedural manual.

FAA Response: Inspection programs other than those developed by the airplane type certificate holder will be approved through a Letter of Approval by the FAA ACO or office of the Small Airplane Directorate or Transport Airplane Directorate responsible for that airplane's type certificate. The inspection programs required by this rule are for specific operations under part 121, 129, or 135 only and are to be added to the operator's maintenance or inspection program. Airplanes not being operated under the conditions specified in this rulemaking are not required to have these inspection programs. Adding such programs to the airworthiness limitations section of an airplane's maintenance manual is not appropriate because it would require that all operators comply with the program, not just those operators identified in this rulemaking.

Structural Assessment of Major Repairs, Alterations, and Modifications

Comments: Transport Canada states the proposal is unclear about how an STC holder is required to support its designs as far as a structural assessment is concerned. Transport Canada notes major modifications/alterations (including major repairs) may have resulted in a significant alteration to the design, affecting the usage spectrum associated with the STC. According to the commenter, this may result in an undue burden on the operator who may need to perform a damage-tolerance-based assessment without assistance from the type certificate holder. Transport Canada states it is inappropriate to require a type certificate holder to provide assistance in such cases. Transport Canada recommends the FAA provide procedures to allow an operator to implement a supplemental integrity program for its airplanes when the type certificate holder is not able to do so because of an STC or major repair.

FAA Response: This rulemaking states that no operator may operate an airplane after 4 years after the effective date of the rule unless the maintenance or inspection program for that airplane includes damage-tolerance-based or service-history-based SSIPs, as applicable. This program applies to the baseline structure of the airplane, which is that structure designed by the original type certificate holder, as well as any existing or future major repairs, major alterations, or modifications. The exceptions to the

4-year requirement are listed in §§ 121.370a, 129.16, and 135.168.

Modifications to the baseline structure can be accomplished by an STC or by the type certificate holder who has certificated a major type design change. The preamble to the NPRM states that the operators should work with STC holders and type certificate holders to accomplish a damage tolerance assessment of the modified structure, but in the event that the STC holder or type certificate holder is not able or willing to help the operator, then the operator will be responsible for accomplishing the damage tolerance assessment. As stated in the preamble to the NPRM, the operator may (1) accomplish the assessment if it has the capability or (2) contract the appropriate persons to accomplish the assessment. The FAA recognizes that this may be a burden on the operator, but the AASA requires the Administrator to ensure the continuing airworthiness of aging airplanes. The FAA has determined that damage-tolerance-based and service-history-based SSIPs are the best way to achieve that goal.

The FAA also has revised AC 91-56A, which provides detailed guidance to type certificate holders and operators regarding the accomplishment of damage tolerance assessments of repaired, altered, or modified structures.

Compliance Alternatives

Comments: Commenters recommend various alternatives to the proposed regulations on damage-tolerance-based SSIPs.

The ATA states incorporation of mandated programs, including "supplemental structural inspection document programs," CPCPs, repair assessment programs, and compliance with air carrier maintenance programs, provides the means necessary to comply with the proposed rule. Other commenters agree with the ATA's position.

FAA Response: The FAA agrees in part and has revised the rule to permit the use of service-history-based SSIPS for certain aircraft. The programs the commenters describe only satisfy part of the requirements of this final rule. SSIPs only address certain portions of an airplane's structure while the damage-tolerance-based or service-history-based SSIPs specified by this rule address the entire primary structure of an airplane, including the baseline structure, and major repairs, major alterations, and modifications to baseline structure.

The "Repair Assessment for Pressurized Fuselages" final rule (65 FR 24108, April 25, 2000) established new §§ 121.370 and 129.32. These sections require a repair assessment program for many of the airplanes also affected by this final rule. These include the Airbus A300, excluding the -600 series; Boeing 707, 720, 727, 737, and 747; BAe BAC 1-11; Fokker F28; and Lockheed L-1011; and McDonnell Douglas DC-8, DC-9/MD-80, and DC-10. However, §§ 121.370 and 129.32 address only fuselage pressure boundary repairs (fuselage skin, door skin, and bulkhead webs).

Meeting the requirements of §§ 121.370 and 129.32 is an acceptable means of compliance with this final rule to the extent that these requirements address repairs to the fuselage pressure boundary for the above-noted airplanes. Operators will have to accomplish additional work to fully comply with this rule. They must establish damage-tolerance-based SSIPs or service-history-based SSIPs, as applicable, for major repairs, major alterations, and modifications to structures not affected by the repair assessment program, such as fuselage frames and longerons, and wing and empennage structures.

Alternatives to Damage-Tolerance-Based Supplemental Structural Inspection Programs

Comments: One foreign aircraft type certificate holder states that the 3- to 10-year compliance thresholds in the NPRM require further detail regarding the intended program before they can be implemented. The type certificate holder specifically would like the FAA to further discuss alternate means of complying with this proposed rule. An FAA-approved repair station specializing in the major repair, alteration, and heavy maintenance of deHavilland DHC-6 airplanes also states the required implementation of existing proven type certificate holder inspections and procedures is a more appropriate response to the airworthiness concerns presented by the FAA than the implementation of new, costly programs. Although the commenter admits damage-tolerance-based "inspections and procedures" may prove useful in the

successful maintenance of DHC-6 airplanes, the commenter states that current safe-life-based component replacement requirements and inspections have proven successful for over 30 years and should be retained.

The GAMA asserts that a regime of replacing components and parts when they reach their design service lives is one way to ensure structural integrity. Other commenters support the GAMA position, noting a damage-tolerance-based SSIP alone is too restrictive. According to the GAMA, these regimes should be appropriate for particular structural configurations and should employ a schedule of supplemental inspections, as necessary. The GAMA states reliance on frequent, repetitive inspection under a damage-tolerance-based approach would allow for greater human error. Additionally, the GAMA disagrees with the FAA's implied requirement that "manufacturers" must be responsible for developing or assisting operators in the development of damage-tolerance-based inspections and procedures. Also, the GAMA notes several "manufacturers" already have developed and made available appropriate structural integrity inspection programs.

Transport Canada agrees with the GAMA position and states a structural integrity inspection program must include mandatory component replacement (safe life), as well as a mandatory inspection program with a CPCP to ensure the fatigue inspections and part replacement remains valid. According to Transport Canada, including a component

replacement (safe life) program is important for the following reasons:

- A safe life program may be required to avoid the risks associated with structural degradation caused by a form of widespread fatigue damage known as multiple site damage (MSD). According to Transport Canada, failure to detect MSD exposes an airframe to a risk of sudden crack coalescence, possibly leading to total structural failure without adequate warning. To ensure structural integrity, Transport Canada asserts a structure that is at risk for MSD must be replaced or repaired at the appropriate interval. According to Transport Canada, an inspection program may not alleviate the risk that there may be cracks too small to be detected reliably. Transport Canada lists several methodologies, including fracture mechanics (crack-growth) techniques and tear-down techniques, that could be used to determine the appropriate component/part replacement (safe life) interval.
- For aging airplanes, particularly in the small commuter class (for example, CAR 3 aircraft, 14 CFR part 23 aircraft, and SFAR 41 aircraft), component design was not influenced by damage tolerance inspection principles. As such, it may be impractical, in an airworthiness sense, to apply the damage tolerance requirements in a retroactive

manner. Transport Canada notes the designers of these airplanes may not have considered the inspectability of their designs and may have designed components to be replaced to ensure structural integrity.

The Civil Aviation Safety Authority of Australia (CASA) supports damage-tolerance-based inspections and procedures and recommends changing the phrase "...unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures" to "...unless the maintenance program for that airplane includes inspections or other procedures developed in accordance with §§ 23.571 to 23.574, or § 25.571, as applicable" for the following reasons:

- Consistency with the design rules - While operational rules may match current design rules, they should not exceed them as proposed in the NPRM, because the NPRM is more restrictive. Part 23 allows three fatigue control options while the NPRM allows only damage-tolerance-based inspections.
- To allow more than one method of analysis - For light airplanes, this change would allow a conventional fatigue evaluation as well as a crack-growth analysis to determine inspection thresholds and life limits for all structures, not just fail-safe structures.

- To allow more than one method of control - There are two ways to control fatigue: safety by inspection and safety by retirement. Neither method is superior and each has its place. Retirement is a practical alternative to inspection and Australian operators routinely replace wing spar lower caps on small twin-engine airplanes. This procedure costs less than an engine overhaul and is required less often. Often operators choose to replace rather than inspect. The CASA suggests the FAA allow and promote replacement and modification in accordance with its policy to avoid relying on continuing inspection for in-service cracking.
- To reduce the cost of compliance - Consistency with the design rules would allow immediate acceptance of airplanes whose maintenance programs have already complied with the part 23 fatigue rules in Australia, the United Kingdom, and (to a lesser extent) the United States.
- To avoid duplication in regulations and guidance material.

FAA Response: The FAA notes that the method of compliance with the rule is currently outlined in AC 91-56A and AC 91-60. The FAA is requesting comments on draft AC 91-56B and AC 91-60A. Once these ACs become final, they too will be considered an acceptable means of compliance

with this rule. For each airplane initially certificated with 10 or more passenger seats, the inspection program will be based on damage tolerance. Many of the new regional commuter airplanes have already been certificated to damage tolerance requirements.

Operators are ultimately responsible for ensuring a damage-tolerance-based SSIP is developed for airplanes initially certificated with 10 or more passenger seats. The FAA encourages airplane type certificate holders to participate in this development. Even if certain airplanes were not initially certificated to a damage tolerance requirement, completing a damage-tolerance-based SSIP is still possible on the airplanes' structures.

In response to the CASA comments, the FAA has deliberately made changes to parts 121, 129, and 135 to address the continuing airworthiness of aging airplanes. This method of compliance is consistent with the AASA. The CASA's comment with reference to the certification requirements of part 23 are appropriately noted, but any changes to part 23 would only affect new designs. Procedures on how to develop a damage-tolerance-based SSIP are described in AC 91-56A.

As discussed earlier in this final rule, the FAA requires a service-history-based SSIP for airplanes initially certificated with 9 or fewer passenger seats, but retains the proposed requirement of damage-tolerance-based

SSIPs for airplanes initially certificated with 10 or more passenger seats.

Mandating Damage-Tolerance-Based Supplemental Structural Inspection Programs Through Airworthiness Directives

Comments: Several commenters state that the implementation of damage-tolerance-based SSIPs on any additional airplane types should be addressed in ADs for those airplane types.

FAA Response: The FAA disagrees. The inspection programs required by this rule are for specific operations under part 121, 129, or 135 only and are to be added to the operator's maintenance or inspection program. Adding such programs through an AD would require that all operators comply, not just those operators identified in this rulemaking. The damage-tolerance-based SSIP must still be approved by the FAA ACO or office of the Small Airplane Directorate or Transport Airplane Directorate responsible for each affected airplane's type certificate and the final rule has been revised to reflect this approval requirement.

Damage-Tolerance-Based Supplemental Structural Inspection Programs for Small Transport Airplanes

Comments: According to the ADOT&PF, a damage-tolerance-based "inspection program" is not an appropriate inspection program for smaller airplanes and components that were not designed to have damage-tolerance-based inspections. Many smaller transport category airplanes are not manufactured to enable applicable components to be

reconfigured for damage-tolerance-based inspections. The commenter believes real-world experience is a better indicator of mechanical failure; neither accident records nor Structural Difficulty Reports support a mandatory damage-tolerance-based "program" for smaller airplanes.

Also, the ADOT&PF notes that developing a damage-tolerance-based "inspection program" requires engineering data for the affected components. These data are not available for most airframes and components; therefore, each user of each type of airframe would be required to reverse engineer the components at great expense. According to the commenter, the only cost-effective way to establish a damage-tolerance-based "inspection program" is for the FAA or the "manufacturer" to develop such a program for only those airframe components compatible with such a retrofit program and to make the data available to users.

The commenter further states retrofitting damage-tolerance-based "programs" may introduce risks to continued airworthiness caused by inspection access issues; that is, inspecting can result in maintenance problems. Additionally, the commenter notes that operators of aging airplanes eventually phase out older airplanes because the maintenance costs for these airplanes increase as the airplane ages; therefore, focusing on aging airplane inspection may not be necessary.

FAA Response: In this final rule, the FAA requires a service-history-based SSIP for airplanes initially

certificated with 9 or fewer passenger seats, but retains the proposed damage-tolerance-based SSIPs for airplanes initially certificated with 10 or more passenger seats.

Applicability to Large Transport Category Airplanes

Comments: One commenter states proposed § 121.370a(a) could be misinterpreted to apply equally to large transport category airplanes. To eliminate confusion, the commenter recommends the FAA alter this paragraph to read as follows:

> "Except as otherwise provided in this section, no certificate holder may operate an airplane listed in appendix [N] under this part after [insert date 4 years after the effective date of the rule] unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures."

FAA Response: The FAA disagrees. Except for airplanes operated by a certificate holder between any point in Alaska and another point in Alaska, § 121.370a is applicable to all airplanes that operate under part 121, including large transport category airplanes.

Part 121 Proposed Changes

Comments: The RAA recommends the FAA remove all part 121 provisions in the NPRM. The RAA asks that the FAA replace them with the requirement that each certificate holder incorporate into its maintenance program either a damage-tolerance-based inspection program or a structural integrity inspection program for each airplane

operated by that certificate holder. The inspection program should require approval by the FAA ACO having cognizance over the type certificate for the affected airplane. According to the RAA, compliance should be required under the guidelines specified in proposed § 121.368(b).

The GAMA recommends the FAA revise § 121.370a(a), (b), and (c) by allowing the use of an FAA-approved structural integrity inspection program based on fatigue analysis and fatigue tests, in addition to the proposed damage-tolerance-based SSIP.

Transport Canada recommends the FAA revise § 121.370a to include and explicitly state that component replacement (safe life) programs are acceptable as a means of ensuring continued structural integrity as an airframe ages.

FAA Response: The FAA disagrees. All airplanes operating under part 121 must have a maintenance program based on damage tolerance regardless of the passenger seating capacity. Many of those airplanes were designed with multiple load path fail-safe or multiple load path crack-arrest design features; therefore, the inspection thresholds can be based on a conventional fatigue analysis and tests with an appropriate scatter factor based on AC 25.571-1C.

Compliance Timeframe for Establishing Damage-Tolerance-Based Supplemental Structural Inspection Programs

Comments: According to the ATA, the requirement in proposed § 121.370a(a) to establish a damage-tolerance-based

"inspection program" within 4 years of the effective date of the rule is unreasonable because damage-tolerance-based "inspections" usually are imposed at a cycle threshold greater than 75 percent of the design-life goal. For example, an anomalous result of the proposal would be for a Boeing 737-800. The Boeing 737-800 is not fully damage tolerance designed and would be required to have a complete SSID within 4 years even though it has been in service only 2 years. The paragraph should be limited to airplanes that do not otherwise have FAA-mandated aging programs, or it could state that such airplanes already meet the paragraph's requirements. One foreign aircraft type certificate holder asks the FAA to reconsider the proposed compliance dates for affected airplanes in proposed § 121.370a.

FAA Response: The FAA disagrees. For any airplane certificated before the effective date of the rule, the operators must have a damage-tolerance-based SSIP in place within 4 years from the effective date of the rule. For an airplane certificated after the effective date of the rule by an amended type certificate that preceded Amendment 25-45 (43 FR 46238 published in 1978), the FAA has revised §§ 121.370a and 129.16 to allow operators to have a damage-tolerance-based SSIP in place within 4 years of the date of the amended type certification. Although this rule specifies dates when a damage-tolerance-based SSIP will be required, the actual inspection thresholds may occur much

later. The FAA believes the times specified in this final rule are adequate.

Proposed Changes to §§ 121.135 and 121.369

Comments: One operator states that § 121.135, Manual content, and/or § 121.369, Manual requirements, can be revised to include the proposed § 121.370a damage-tolerance-based "inspection requirements."

FAA Response: The FAA disagrees. The requirement for a damage-tolerance-based SSIP is independent of any requirement for inclusion in an operator's manual. It has been added to § 121.370a to keep all the requirements for aging airplane supplemental inspections in part 121 in one section.

Part 129 Proposed Changes

Comments: The RAA recommends the FAA remove all part 129 provisions in the NPRM. The RAA asks that the FAA replace them with the requirement that each certificate holder incorporate into its maintenance program either a damage-tolerance-based "inspection program" or a structural integrity inspection program for each airplane operated by that certificate holder. The inspection program should require approval by the FAA ACO having cognizance over the type certificate for the affected airplane. According to the RAA, compliance should be required under the guidelines specified in proposed § 129.33(b).

The GAMA recommends that the FAA revise § 129.16(a), (b), (c), and (d) by allowing the use of an FAA-approved structural integrity inspection program based on fatigue analysis and fatigue tests, in addition to a proposed damage-tolerance-based "inspection program." Additionally, the GAMA notes that the preamble to the NPRM refers to requiring damage-tolerance-based "inspections and procedures" earlier than December 20, 2010, for airplanes with nine or fewer passenger seats operated under part 129. The GAMA states that the preamble does not properly reflect the proposed requirement in § 129.16(b).

Transport Canada recommends the FAA revise § 129.16 to include and explicitly state that component replacement (safe life) programs are acceptable as a means of ensuring continued structural integrity as an airframe ages.

FAA Response: In this final rule, the FAA requires a service-history-based SSIP for airplanes initially certificated with 9 or fewer passenger seats, but retains the proposed damage-tolerance-based SSIPs for airplanes initially certificated with 10 or more passenger seats.

A large number of airplanes operating in part 129 were designed with multiple load path fail-safe or multiple load path crack-arrest design features; therefore, the inspection thresholds can be based on a conventional fatigue analysis and tests with an appropriate scatter factor based on AC 25.571-1C.

Airplanes initially certificated with nine or fewer passenger seats will not require a service-history-based SSIP until December 20, 2010, unless the airplane is listed in appendix B to part 129. For those airplanes, a schedule based on the design-life goal is shown in § 129.16(d).

Section 129.16(a)

Comments: One commenter states proposed § 129.16(a) could be misinterpreted to apply equally to large transport category airplanes. Similar to its comment regarding § 121.370a, the commenter recommends the FAA reference appendix B to part 129 in § 129.16(a).

FAA Response: The FAA disagrees. Section 129.16(a) is applicable to all U.S.-registered multiengine airplanes that operate under part 129, which includes large transport category airplanes.

The FAA proposed to revise § 129.1(b) to specify the applicability of the aging airplane requirements to some operations conducted under part 129. In this regard, the FAA inadvertently failed to cite § 129.32 and proposed § 129.33 in proposed § 129.1(b). This final rule corrects that omission.

In addition, the FAA has revised the rest of § 129.1 to make it easier to read. The paragraph (a) reference to the "exception" in paragraph (b) was not accurate, because the requirements referenced in paragraph (b) add to those in paragraph (a), as opposed to conflicting with them. Thus,

the FAA has deleted from paragraph (a) "except as provided in paragraph (b) of this section." The FAA has added headings to paragraphs (a) and (b), and has placed the definition of "foreign person" and "years in service" in a new paragraph (c). Paragraph (b) now specifically includes the applicability of §§ 129.14, 129.16, 129.20, 129.32, and 129.33 to operations of U.S.-registered aircraft operated solely outside the United States in common carriage by a foreign person or foreign air carrier.

The FAA has not made any substantive changes to part 129, other than adding the aging airplane requirements and specifying that the requirements would only apply to U.S. multiengine airplanes operated under the part.

Part 135 Proposed Changes

Comments: The RAA recommends the FAA remove all part 135 provisions in the NPRM. The RAA asks that the FAA replace them with the requirement that each certificate holder incorporate into its maintenance program either a damage-tolerance-based "inspection program" or a structural integrity inspection program for each airplane operated by that certificate holder. The inspection program should require approval by the FAA ACO having cognizance over the type certificate for the affected airplane. According to the RAA, compliance should be required under the guidelines specified in proposed § 135.422(b).

The GAMA recommends the FAA revise § 135.168(a), (b), (c), and (d) by allowing for use of an FAA-approved

structural integrity inspection program based on fatigue analysis and fatigue tests, in addition to a proposed damage-tolerance-based "inspection program." Additionally, the GAMA notes the preamble to the NPRM refers to requiring damage-tolerance-based "inspections and procedures" sooner than December 20, 2010, for airplanes with nine or fewer passenger seats operated under part 135. The GAMA states the preamble does not properly reflect the proposed requirement in § 135.168(b).

Transport Canada recommends the FAA revise § 135.168 to include and explicitly state that component replacement (safe life) programs are acceptable as a means of ensuring continued structural integrity as an airframe ages.

Although generally supportive of the proposal, the CASA is concerned about the practicalities and details of the proposed rule, particularly for light airplanes operating under part 135.

The U.K. CAA notes that the NPRM states that it "does not propose requirements for on-demand passenger or cargo carrying operations under part 135." However, the NPRM does introduce a new § 135.168. The CAA questions how the distinction would be made so that on-demand operations are exempt from the rule.

FAA Response: The FAA disagrees. In response to the U.K. CAA's comment, this rule is applicable to operators conducting scheduled operations as defined in § 119.3. The three requirements for scheduled operations include: five

round trips per week, one route between two or more points, and the publication of a schedule. On-demand or cargo-only operations conducted under part 135 are not affected by this rule.

In this final rule, the FAA requires a service-history-based SSIP for airplanes initially certificated with 9 or fewer passenger seats, but retains the proposed damage-tolerance-based SSIPs for airplanes initially certificated with 10 or more passenger seats.

Proposed Appendixes

Summary of Proposal/Issue: To assist in implementing the proposed rule, the FAA included appendixes that list the FAA-established design-life goals of several airplane types commonly used in scheduled service. Proposed appendix N to part 121 lists the airplanes and design-life goals referenced in proposed § 121.370a. Proposed appendix B to part 129 lists the airplanes and design-life goals referenced in proposed § 129.16. Proposed appendix G to part 135 lists the airplanes and design-life goals referenced in proposed § 135.168.

General

Comments: The RAA states the proposed appendixes would conflict with other FAA-approved certification documents unless they are updated continually. The RAA notes several of the design-life goals provided are inaccurate and, once adopted, would require constant revision. According to the

RAA, several foreign-based airframe OEMs contend that the proposed fatigue lives for their fleet types are inaccurate and that extensions have been approved by foreign regulatory authorities. Also, the RAA states the design-life goals do not account for the differences in design-life goals that exist between the various airplane structures (for example, wings, fuselage, and vertical and horizontal stabilizers).

FAA Response: This rulemaking action is intended to ensure the continued airworthiness of the affected airplanes by requiring SSIPs based on damage tolerance or service history. In response to the RAA's comment, the FAA has published the design-life goals of certain airplanes in the appendixes of the final rule to provide a quick reference to operators. The FAA has not imposed any new requirements through these appendixes. However, as a result of comments received, the FAA has corrected the appendixes to reflect current FAA-approved design-life goals. The FAA has no intention to further delay implementation of the damage-tolerance-based SSIPs.

For airplanes initially certificated with nine or fewer passenger seats, the FAA originally proposed an inspection program that includes damage-tolerance-based SSIPs. In response to the comments received, this final rule adds an exception for multiengine airplanes initially certificated with nine or fewer passenger seats and conducting scheduled operations under part 129 or part 135. Those airplanes can

have a service-history-based SSIP instead of a damage-tolerance-based SSIP.

Airplanes operating under part 121 must have damage-tolerance-based SSIPs 4 years after the effective date of the rule. For those airplanes listed in the appendix, from 4 years after the effective date of the rule, the certificate holder may operate that airplane until the date the airplane's time in service reaches the design-life goal or until December 20, 2010, whichever occurs sooner. As noted in the preamble to the proposal, the design-life goals listed are a result of information from the type certificate holder, the airworthiness authorities of other countries, or the FAA.

Appendix N to Part 121

Comments: Commenters provide specific comments regarding proposed appendix N to part 121. The RAA states that the information provided in appendix N to part 121 can be obtained from other sources and is therefore redundant. Another commenter believes the FAA should include in appendix N any airplane that has design-life goals established for flight cycles and afford them the same opportunities to develop "SIPs" based on these goals. According to the commenter, the FAA also should consider providing another appendix to part 121 listing those airplanes that have existing FAA-approved "SIPs" that meet the proposed requirements.

FAA Response: The FAA disagrees. Appendix N is necessary to determine when damage-tolerance-based SSIPs are required for airplanes with design-life goals; appendix N lists those design-life goals. The rest of the airplanes operating under part 121 must comply within 4 years after the effective date of the rule.

The FAA did not want to provide another appendix to part 121 because a list of SSIPs mandated through specific ADs may have to be revised. If these ADs were listed in such an appendix, the FAA would have to revise the appendix through rulemaking action each time a SSIP was changed.

Appendix B to Part 129

Comments: Regarding proposed appendix B to part 129, the RAA states the information provided in the appendix can be obtained from other sources and is therefore redundant.

FAA Response: Appendix B is necessary to determine when damage-tolerance-based SSIPs are required for airplanes with design-life goals.

Appendix G to Part 135

Comments: Regarding proposed appendix G to part 135, the RAA states the information provided in appendix G can be obtained from other sources and is therefore redundant.

Another commenter operating in Alaska states there is no technical basis for including some airplanes in appendix G and not others. The commenter cites the example of the Piper Seneca, which could operate until 2010 without

a "SIP" even though it may be older and have "higher time" than a Piper PA31-350 that would have to comply 6 years earlier. This results in arbitrary and capricious rules. Operators who are fortunate, whose airplanes were the subject of "non-damage-tolerance-based ADs" before the rule change, also could operate until 2010.

According to the commenter, the FAA should consider allowing all nonpressurized airplanes of nine or fewer passenger seats to operate without a "SIP" until 2010 and reevaluate these airplanes based on the experience with larger pressurized airplanes. The NPRM is not clear about whether compliance would be delayed for airplanes with nine or fewer passenger seats. Such a change would dramatically reduce the burden to small businesses and would be a negligible change to the rule.

FAA Response: The FAA agrees in part. Appendix G is necessary to determine when damage-tolerance-based or service-history-based SSIPs are required for airplanes with design-life goals.

In response to the commenter's suggestion that the FAA delay compliance with this final rule for airplanes initially certificated with nine or fewer passenger seats, the FAA agrees and has amended proposed § 135.168 to reflect this change.

BAe Jetstream Model 3101 or 3201

Comments: British Aerospace (Operations) Limited states that the design-life goals listed in this proposal for the Jetstream 3101 and 3201 do not represent current figures published in approved aircraft maintenance documentation. The commenter indicates that the U.K. CAA approved revised figures in 1997. According to the commenter, the revised Jetstream 3101 lives of the components of the airframe are as follows: (1) 45,750 landings for the wing, (2) 46,200 landings for the fuselage, (3) 60,360 landings for the vertical stabilizer, and (4) 45,000 landings for the horizontal stabilizer. The revised Jetstream 3201 lives of the components of the airframe are as follows: (1) 30,000 landings for the wing, (2) 46,200 landings for the fuselage, (3) 55,500 landings for the vertical stabilizer, and (4) 40,000 landings for the horizontal stabilizer.

FAA Response: The FAA agrees. Using correlation between flight hours and landings specified in Notice No. 99-02, the FAA has revised appendix N to part 121, appendix B to part 129, and appendix G to part 135 to reflect the new design-life goals for the Jetstream 3101. The Jetstream 3201's design-life goal remains at 30,000 hours.

Beech 1900 (any model)

Comments: The Raytheon Aircraft Company (Raytheon) states the wings on Beech 1900 aircraft use a damage

tolerance approach based on test data to define an inspection program. The fuselage uses a fail-safe approach based on test data to define an inspection program. Also, the empennage currently is a safe-life item based on analysis only. Raytheon recommends the FAA include this information in the proposal.

FAA Response: The FAA recognizes that Beechcraft uses a damage tolerance approach based on test data to define an inspection program for the Beech 1900 wings. The FAA also recognizes that the fuselage uses test data to define an inspection program, and the empennage is a safe-life item based on analysis only.

The FAA finds that an inspection program based solely on test data is not consistent with the requirements of the final rule. A damage-tolerance-based SSIP still needs to be developed for the Beech 1900 within the timeframes listed in this rulemaking.

Beech 300, 300LW, B300, or B300C

Comments: Raytheon states the wings on these airplanes use a damage tolerance approach based on test data to define an inspection program. The fuselage uses a fail-safe approach based on test data to define an inspection program. Also, the empennage currently is a safe life item based on analysis only. Raytheon recommends the FAA include this information in the final rule.

FAA Response: The FAA recognizes that Raytheon uses a damage tolerance approach based on test data to define an inspection program for the Beech 300 empennage. The FAA also recognizes that the fuselage uses test data to define an inspection program.

The FAA finds that a SSIP based solely on test data is not consistent with the requirements of the final rule. A damage-tolerance-based SSIP still needs to be developed for the Beech 300 within the timeframes listed in this rulemaking.

Beech 99 (any model)

Comments: Raytheon recommends the FAA note in the proposal that currently there is a Continued Airworthiness Program in place for Beech 99 models, based on full-scale tests and field experience. According to Raytheon, this program details inspections of all major components: wing, fuselage, and empennage. Raytheon states the current 46,000-hour life limit is based on analysis supported by test data.

FAA Response: The FAA acknowledges that Raytheon has a continued airworthiness program in place for the Beech 99 models based on full-scale tests and field experience. The FAA also acknowledges that the current 46,000 hour limit is based on analysis supported by test data.

The FAA finds that an inspection program based solely on test data is not consistent with the requirements of the

final rule. A damage-tolerance-based SSIP still needs to be developed for all Beech 99 models within the timeframes listed in this rulemaking.

Cessna 402

Comments: One operator states that DOT/FAA/AR-98/66 (Supplementation Inspection Document Development Program for the Cessna Model 402) and Cessna Aircraft Company Structures Report No. S-402-76-2 (Model No. 402) do not support design-life goals for the Cessna 402C (7,700 hours for the wing structure was cited in the proposal). The commenter notes all tests were conducted in accordance with fail-safe requirements in § 23.572, Metallic wing, empennage, and associated structures.

An Alaskan operator states that AD 79-10-15, "Cracks in Wing Structure," on the Cessna 402 has been very successful in addressing aging airplane concerns. However, while the NPRM proposes inspections every 5,000 hours, the AD requires inspections every 400 hours. This demonstrates that the "one-size-fits-all" approach does not address the safety needs of aging airplanes. According to the commenter, inspection of such a critical primary structure can and should be undertaken much more frequently than every 5,000 hours, especially for airplanes with fewer than 10 seats. For example, the commenter's fleet of Chieftains operates under an approved airworthiness inspection program that ensures all critical structures are inspected every 360 hours.

FAA Response: The FAA is requiring service-history-based SSIPs for each multiengine airplane initially certificated with nine or fewer passenger seats. However, Cessna has developed a damage-tolerance-based SSIP, and the FAA strongly encourages operators to incorporate this program into their existing inspection programs.

The Cessna-developed damage-tolerance-based SSIP provides sufficient continuing airworthiness information to meet the intent of a service-history-based SSIP and can be used to comply with that requirement.

The FAA has corrected the design-life goal for the Cessna 402 in appendix B to part 129 to 7,700 hours, which is based on the design-life goals established by U.K. and Australian airworthiness authorities. With respect to the commenter's reference to a 5,000-hour repetitive inspection interval number, it is unclear where the commenter obtained this number, which is not applicable to the Cessna 402 SID program.

This final rule includes the requirement for service-history-based SSIPs for airplanes initially certificated with nine or fewer passenger seats. Guidance for complying with a service-history-based SSIP will be provided in an AC. The FAA is requesting comments on draft AC 91-56B and AC 91-60A. Once these ACs become final, they too will be considered an acceptable means of compliance with this rule. Based on service experience, different inspection thresholds and intervals may be required for different aircraft models.

deHavilland DHC-6 (any model)

Comments: Bombardier Aerospace (Bombardier) notes that the deHavilland DHC-6 Series 300 originally was certificated with a 66,000-hour safe life with a one-time wing replacement mandated at 33,000 hours. However, Bombardier and Transport Canada concluded in 1996 that continued operation of this airplane type under the originally certificated safe-life provisions (augmented by damage-tolerance-based inspection of those parts of the structure where this was practicable) was the most appropriate course of action for ensuring the (certification) level of safety of these airplanes is preserved. The commenter also notes that Transport Canada issued AD CF-96-15 on September 17, 1996, for all models of the DHC-6 Twin Otter airplanes requiring these additional actions to ensure continued structural integrity. The commenter notes the FAA has not mandated this program and requests that the FAA do so as part of its aging airplane safety initiative. Additionally, according to Bombardier, the retirement time for the DHC-6 (100, 200, or 300 series) is 66,000 hours or 132,000 flights, whichever occurs first. According to Bombardier, the design-life goal for the DHC-6 is identified incorrectly in the proposed appendixes as 33,000 hours.

One FAA-approved repair station specializing in the major repair, alteration, and heavy maintenance of DHC-6 airplanes notes DHC-6 component life limits are provided in deHavilland PSM 1-6-11, "Structural Components Service

Life Limits." The structural components addressed in this document include the wing box, strut, and FS 219 fuselage lower frame. According to the commenter, these "manufacturers'" limits have been validated successfully through decades of field experience. The use of damage tolerance analysis to further assess airplane structure is redundant. According to the commenter, although certain remaining components might be subject to further structural fatigue evaluation, several of these components are either replaceable, already inspected at continuous intervals, or not considered fatigue-critical. The commenter states a more appropriate fatigue analysis approach would be to establish safe-life criteria for these additional components.

Transport Canada states that the NPRM statement "This Canadian AD, issued in September of 1996, mandates the retirement of the airplane at 66,000 hours" is incomplete. Airplane retirement at 66,000 hours is dependent on the completion of the mandatory supplemental integrity requirements in Canadian AD CF-96-15. To achieve the 66,000-hour design-life goal, a program of inspections and parts replacements is required. Transport Canada recommends that the statement be amended to say, "...the retirement of the airplane at 66,000 hours is required as a result of AD CF-96-15, providing all the requirements of the AD are accomplished."

Transport Canada also states that the DHC-6 meets the requirements of § 511.34 of the Canadian Aviation Regulations, Supplemental Integrity Instructions, per Transport Canada AD CF-96-15, which requires additional actions to ensure continued structural integrity as an airframe ages. Transport Canada was unaware of a similar FAA-mandated AD.

Twin Otter International, Ltd. (TOIL), states that the DHC-6 should not have to comply with damage-tolerance-based inspection techniques for the following reasons:

- deHavilland designed the Twin Otter (DHC-6-300) with the intention that fatigue-critical components (that is, fuselage mainframe, wing struts, and wing boxes) must be replaced upon reaching either a flight hour or a cycle limit, whichever occurs first. Although the life limit of the wing struts and fuselage mainframe originally were established at 30,000 hours/60,000 cycles, Transport Canada, in revision 4 to the life limits manual (Structural Components Service Life Limits Manual, PSM-1-6-11), raised the wing strut life to 36,000 hours/ 72,000 cycles and the mainframe life to 39,000 hours/78,000 cycles. These components are inspected frequently using strict damage criteria. The commenter notes that the life of wing boxes (30,000 hours/60,000 cycles) can be raised to 33,000 hours/66,000 cycles with incorporation of a

service bulletin that adds structural reinforcement. The commenter adds that each of these components is inspected frequently in accordance with strict damage criteria. Also, upon reaching their life limits, the components must be replaced completely or, in the case of wing boxes, re-lifed (which may be done only once). Because of re-lifing, Transport Canada established a safe life for DHC-6 wing boxes of 66,000 hours/132,000 cycles. TOIL also notes that two STCs have been approved to extend the life of DHC-6-300 wing boxes.

- TOIL maintains its DHC-6 airplanes in accordance with the factory inspection and maintenance program Equalized Maintenance for Maximum Availability (EMMA), which requires certain scheduled inspections every 100 hours. If EMMA is followed, TOIL states that there is no additional benefit to implementing damage-tolerance-based inspection procedures.
- TOIL believes corrosion, not structural fatigue, is the cause of structural damage in the DHC-6. TOIL reminds the FAA that on August 24, 1994, Transport Canada issued an AD requiring all DHC-6 airplanes to be subject to exhaustive and repetitive corrosion inspections.
- In 1994, the Aviation Rulemaking Advisory Committee (ARAC) Technical Oversight of Aging Airplanes working group generally accepted the

"manufacturer's" method of ensuring continued structural integrity based on structural fatigue analysis, fatigue tests, and field experience correlation. Additionally, TOIL notes that the AASA does not mandate damage-tolerance-based analysis and inspection techniques. However, the AASA recognizes that the continued airworthiness of airplanes could be ensured through other means, particularly those airplane designs not based on damage tolerance guidelines.

FAA Response: The FAA believes that the commenter's reference to the ARAC Technical Oversight of Aging Airplanes group actually refers to the Technical Oversight Group Aging Aircraft (TOGAA) that works with the FAA, but that group does not directly participate in ARAC group activities. The FAA assumes that the commenter is referring to the TOGAA in its comment.

In November 1996, the Commuter Assessment Review Team (CART), which included members from the TOGAA, visited deHavilland to determine what difficulties were associated with conducting a damage tolerance assessment of the DHC-6. The CART found that deHavilland had the capability to perform a damage tolerance assessment of the DHC-6 if they chose to do so. At that meeting, the members of the TOGAA on the CART recommended that deHavilland perform a damage tolerance assessment of the DHC-6.

Congress, through the AASA, instructed the Administrator to "prescribe regulations that ensure the continuing airworthiness of aging aircraft." The AASA also stated that air carriers must "demonstrate to the Administrator, as part of the inspection, that the maintenance of the aircraft's age-sensitive parts and components has been adequate and timely enough to ensure the highest degree of safety."

The FAA has determined that to ensure the continuing airworthiness of these aging aircraft, each airplane operated under part 121, each U.S.-registered multiengine airplane that was initially certificated with 10 or more passenger seats operated under part 129, and each multiengine airplane that was initially certificated with 10 or more passenger seats operated in scheduled operations under part 135 should be required to have a damage-tolerance-based SSIP included in its maintenance or inspection program.

For the DHC-6, if the aircraft is used in any of the affected operations, then the operator must have a damage-tolerance-based SSIP included in each aircraft's maintenance or inspection program, in accordance with the schedule in this rulemaking.

Regarding the commenter's discussion of component life limits, the FAA used these limits to establish the design-life goal for many of the airplanes identified in the appendixes. The design-life goal for the DHC-6 was chosen

based on the wing life-limit of 33,000 hours. Also, the FAA has determined that a damage-tolerance-based SSIP must be accomplished for all airplanes initially certificated with 10 or more passenger seats. In addition, for DHC-6 airplanes that are in service 4 years after the effective date of the rule and have not yet reached the design-life goal, the FAA has determined that a damage-tolerance-based SSIP must be in place by 33,000 hours or by December 20, 2010, whichever occurs sooner. As a result, the FAA has not issued an AD similar to Canadian AD CF-96-15.

Comments: One Alaskan commenter argues that no replacement airplanes are being manufactured that can match the rugged and unpressurized DHC-6 Twin Otter. The commenter uses the airplanes to provide essential service to many communities in Alaska that have no other source of air transportation. The commenter claims that relegating the airplanes to part 135 cargo operations as a result of the rule change would be a great disservice to the Alaskan people and would degrade safety because the airplanes would be replaced by single-engine, single-pilot airplanes with nine or fewer passenger seats.

FAA Response: Regarding the Alaskan commenter's contention that the DHC-6 provides essential service to many communities in Alaska, the FAA has decided to permit relief from all requirements of this rule for those airplanes operating between any point within the State of Alaska and any other point within the State of Alaska. This change is

reflected in §§ 121.368(a), 121.370a(a), 135.168(a), 135.422(a), and 135.422a(a).

Embraer EMB-110

Comments: Empresa Brasileira de Aeronautica S.A. (Embraer) states that the expected fleet in operation by December 2010 would have a substantial residual life (based on original certification criteria). The proposed rule would significantly impact operators and "manufacturers" and would put a sizeable portion of the EMB-110 fleet in an economically impracticable situation unless the FAA makes some simplified methodology available.

Embraer understands that the particular characteristics of each airplane's design would be taken into consideration to allow alternative courses of action. In the case of the EMB-110, two facts must be taken into account: (1) contrary to the proposal, the EMB-110 is not a pressurized airplane, and (2) a service bulletin permitting the extension of the "design service goal" from 30,000 to 45,000 flight hours is available.

FAA Response: The FAA acknowledges the comment; however, the commenter did not provide any evidence that the 45,000 flight hour design-life goal in the service bulletin has been approved by the Brazilian regulatory authority. Therefore, the FAA is not changing the design-life goal of the EMB-110 from 30,000 to 45,000 flight hours. These airplanes will be required to have a damage-tolerance-based

SSIP within the timeframes mandated in this rulemaking. The FAA encourages Embraer to support development of the damage-tolerance-based SSIP for the EMB-110.

Piper Navajo and PA-31 Series

Comments: One operator indicates it has spoken with a representative from New Piper, Inc., regarding the impacts of this proposal. The commenter notes that the Piper Aircraft Corporation that originally produced the PA-31 series went bankrupt. New Piper, Inc., supports Out-of-production airplanes only on any issues affecting the airworthiness of those airplanes. The commenter fears that because Australia and the United Kingdom already have established an arbitrary maximum airframe limit, New Piper simply might endorse that limit. The commenter opposes such acceptance. The commenter notes that the Piper Chieftain series of airplanes have relatively few stresses placed on them compared to pressurized airframes.

One Alaskan operator states that the design lives set for the PA-31-350 airplanes (excluding the pressurized version) appear to have no basis and are unrealistically low. The average fleet service life already exceeds the design life set by the proposal. The commenter knows of no failures of primary structure on these airplanes that would justify attributing such a limit to aging. According to the operator, neither the FAA nor the "manufacturer" has set a design-life goal on the airplanes, and it is unreasonable to rely on a design life set by a foreign country that did not

certificate the airplanes. The commenter also states that there is no evidence that the foreign country conducted any analysis to develop the design life for the airplanes. The commenter's company has operated several PA-31-350 airplanes in excess of 20,000 hours total time without any indication that the airplanes have reached their design life.

FAA Response: The FAA has revised the rule so that operators of airplanes initially certificated with nine or fewer passenger seats may develop a service-history-based SSIP instead of a damage-tolerance-based SSIP.

Short Brothers SD3-30

Comments: The European Aging Aircraft Working Group (EAAWG) states that the SD3-30 meets the requirements of AC 91-56 and the FAA should consult the "manufacturer" to clarify this issue.

FAA Response: Through informal discussions with the U.K. CAA, the FAA has learned that the Short Brothers 3-30 and 3-60 airplanes meet the intent of AC 91-56, but the U.K. CAA is unable to present documentation to confirm that the FAA has previously accepted the U.K. CAA finding. This final rule requires that the operators of these airplanes include damage-tolerance-based SSIPs in the maintenance program for each airplane within the timeframes in this rulemaking. If the type certificate holder can demonstrate that the existing maintenance program for each airplane meets the intent of AC 91-56, then compliance with this rule

will be made considerably easier for each operator. Operators can use the type certificate holder's program as the basis for their damage-tolerance-based SSIPs, altering each one as necessary to account for any modifications and repairs incorporated into specific airplanes in an operator's fleet.

Because documentation from the U.K. CAA is not available at the time this final rule is being published, the economic analysis portion of this rule reflects costs associated with development of damage-tolerance-based SSIPs of the Short Brothers 3-30 and 3-60 airplanes assuming none currently exist.

Short Brothers SD3-60

Comments: Bombardier Aerospace Short Brothers (USA), Inc., states that the proposal lists a design-life limit of 28,800 hours for the SD3-60. However, the commenter states that type certificate data sheet A41EU, Note 3, states the life limit is as listed in Chapter 5 of the approved Maintenance Manual Document Ref. 360/MM. According to the commenter, this manual states the airplane has an economic structural limit of 57,600 flight hours or 100,000 flights (whichever occurs first). The commenter notes that the manual requires a structural half-life audit at 28,800 flight hours or 50,000 flights.

The EAAWG states that the SD3-60 meets the requirements of AC 91-56 and the FAA should consult the "manufacturer" to clarify this issue.

FAA Response: Through informal discussions with the U.K. CAA, the FAA has learned that the Short Brothers 3-30 and 3-60 airplanes meet the intent of AC 91-56, but the U.K. CAA is unable to present documentation to confirm that the FAA has previously accepted the U.K. CAA finding. This final rule requires that the operators of these airplanes include damage-tolerance-based SSIPs in the maintenance program for each airplane within the timeframes in this rulemaking. If the type certificate holder can demonstrate that the existing maintenance program for each airplane meets the intent of AC 91-56, then compliance with this rule will be made considerably easier for each operator. Operators can use the type certificate holder's program as the basis for their damage-tolerance-based SSIPs, altering each one as necessary to account for any modifications and repairs incorporated into specific airplanes in an operator's fleet.

Because documentation from the U.K. CAA is not available at the time this final rule is being published, the economic analysis portion of this rule reflects costs associated with development of damage-tolerance-based SSIPs of the Short Brothers 3-30 and 3-60 airplanes assuming none currently exist.

Short Brothers SD3-Sherpa

Comments: Short Brothers PLC proposes that the FAA amend the proposal so that (1) the reference to SD3-30 in

line 4 of the proposed appendixes section of the preamble for the Short Brothers SD3-Sherpa (64 FR 16304) correctly reads "SD-3 Sherpa"; (2) 40,000 hours in line 10 reads "35,000 flights"; and (3) the SD3-60 Sherpa airplanes and the following descriptive text be included:

> The Short Brothers SD3-60 Sherpa is a 32-seat airplane configured for 30 passenger seats and 2 pilot seats. The SD3-60 Sherpa was certificated in the United States in 1996 under U.K. certification basis and to the additional validation requirements of part 25, Amendment No. 35. The "manufacturer" has limited the maintenance program to 12,000 flights as defined in the airplane maintenance manual.

FAA Response: The FAA recognizes that some of the references made to the SD3-60 and SD-3 Sherpa as stated in the NPRM (64 FR 16304) were incorrect. All of the appendices in the final rule have been revised to reflect the correct information.

Non-Damage-Tolerance-Based Structural Supplemental Inspection Programs

Summary of Proposal/Issue: The FAA notes that non-damage-tolerance-based SSIPs based on AC 91-60, "The Continued Airworthiness of Older Airplanes," have been mandated by ADs on the following airplanes: Convair 340, 440, 580, and 600 series; Douglas DC-3 and DC-6; Fokker F-

27; and Lockheed Electra. Although inspections and procedures based on AC 91-60 address known service difficulties, they do not anticipate the possibility of future fatigue cracks that could be predicted through the use of damage tolerance principles. The FAA has determined that some inspection programs developed in accordance with AC 91-60 do not qualify as damage-tolerance-based inspections and procedures because they are either based solely on service experience or combine partial damage-tolerance-based assessments with service experience. For these reasons, the proposed rule would not allow continued use of inspection programs based on AC 91-60 alone. Instead, the FAA proposes to require damage-tolerance-based inspections and procedures to supplement or replace existing inspection programs based on AC 91-60 no later than December 20, 2010.

Inspection Programs in Accordance With AC 91-60

Comments: The GAMA notes, contrary to the FAA's statements, that some AC 91-60 inspections and procedures programs have been designed to anticipate the possibility of future cracking in the structure and have specified appropriate inspections and procedures to find such occurrences. The FAA should revise its incorrect and broad generalization.

FAA Response: The FAA agrees. The existing AC 91-60 inspection programs were accomplished by different type

certificate holders that made different assumptions to create their individual programs. The FAA understands that differences exist between these programs. The minimum standard for a service-history-based SSIP was provided in AC 91-60.

Fokker F-27

Comments: Several commenters question the FAA's assertion that the Fokker F-27 "SIP" is not based on damage tolerance principles. According to these commenters, the Fokker F-27 "SIP," Document No. 27438, Part 1, has been declared by the FAA as having been prepared in accordance with AC 91-56, "Supplemental Structural Inspection Program for Large Transport Category Airplanes," which qualifies the program as an acceptable damage-tolerance-based inspection program. One operator notes Fokker performed full-scale and detailed tests as well as fatigue analysis (calculations) of the Fokker F-27 primary structure during the original certification process of the airplane. These tests were performed to ultimate loads. The fatigue inspection requirements and structural life limits resulting from those tests were included in the "SIP." Additionally, the operator notes Fokker continues to add service experience, including stress corrosion, to the program. Also, Fokker continues to evaluate the areas of concern, new designs and developments, and service experience using damage tolerance assessments.

FAA Response: The FAA agrees. Based on a review of our records, the FAA has determined that the Fokker F-27 SSIP mandated by AD was approved by the FAA as a damage-tolerance-based inspection program in compliance with AC 91-56.

Convair 580

Comments: One operator states the Convair 580 has had excellent engineering and product support for over 45 years and has a well-proven structural integrity inspection document and corrosion inspection programs. The operator also asserts that it has implemented AD 88-22-06 (revised to AD 92-06-06), "Boeing: Amendment 39-6490," and AD 92-25-13, "General Dynamics, Convair Division: Amendment 39-8427." According to the operator, implementation of these ADs added 132 new inspection tasks relating to the AASA. Additionally, the operator has implemented AD 90-13-13, "General Dynamics (Convair): Amendment 39-6638," and AD 74-16-01, "General Dynamics: Amendment 39-1904, as amended by Amendment 39-3206." Another commenter states the type certificate data sheet holder for the Convair 580 indicated it would cost approximately $2.5 million for an operator of this airplane to develop a damage-tolerance-based "SIP," because the historical data required for development do not exist.

FAA Response: The FAA has determined that Convair 340/440/580 aircraft can operate until

December 20, 2010. At that time, a damage-tolerance-based SSIP will be required. The FAA encourages the current type certificate holder to develop a damage-tolerance-based SSIP to support this airplane in service.

Lockheed L-188 Electra

Comments: According to one operator, the Lockheed L-188 Electra SID program was developed using damage-tolerance-based principles and was not based solely on empirical service data. In a separate comment, Lockheed Martin Aeronautical Systems (Lockheed) indicates to operators of the Lockheed L-188 Electra that the cost to develop an aging airplane program and perform its inspections and modifications would need to be addressed by each operator. According to Lockheed, operators should consider the following options:

- Individually or as a group, develop an Electra aging airplane program;
- Fund a third party to develop an Electra aging airplanes program, which Lockheed would be willing to do if funded by operators; or
- Petition the FAA for relief using the AC 90-60 non-damage-tolerance-based "SIP" issue to defer action until 2010.

FAA Response: The FAA agrees. Based on a review of our records, the FAA has determined that the Lockheed L-188

SSIP mandated by AD was approved by the FAA as a damage-tolerance-based SSIP in accordance with AC 91-56.

DC-6 and C-46

Comments: One commenter who currently operates Douglas DC-6 and Curtiss C-46 airplanes notes it may continue to operate either or both types of airplanes beyond 2010. The commenter further states that if it does upgrade to newer airplanes, the newer airplanes probably will not have damage-tolerance-based inspections in their maintenance programs. Additionally, the commenter notes the lack of "manufacturer" support in developing adequate damage-tolerance-based "inspection programs." According to the commenter, the Curtiss company no longer supports its airplanes. Also according to the commenter, Boeing (which acquired Douglas) has indicated to the commenter that it is not considering supporting the DC-6 (and probably nothing older than the DC-10) in this area.

FAA Response: The FAA has established that a damage-tolerance-based SSIP must be developed for the DC-6 by December 2010 and for the C-46 within 4 years after the effective date of the rule, or those airplanes will not be eligible for operations in part 121, or part 129, or in scheduled operations in part 135. In the future, operators of these airplanes will have to make decisions on how best to support the operation of these airplanes.

Other FAA Initiatives

Comments: One commenter singled out the Fokker F-28 jet, noting there was significant activity a few years ago on a repair assessment program for elements of damage tolerance. According to the commenter, because there has been no regulatory activity (that is, establishment of repair requirements) on repairs for the Fokker F-28, it would be inappropriate to review repairs for damage-tolerance-based inspections.

FAA Response: The final rule titled "Repair Assessment for Pressurized Fuselages" (65 FR 24108, April 25, 2000) that became effective May 25, 2000, is applicable to the Fokker F-28. Therefore, operators must make a damage tolerance assessment of the repairs to the Fokker F-28 fuselage pressure boundary.

Discussion of Economic or Cost Comments

Summary of Proposal/Issue: In accordance with Executive Order 12866, the FAA prepared an economic analysis of the proposed changes to the Code of Federal Regulations. The FAA assessed the costs associated with the following items:

- Implementation of damage-tolerance-based inspections and procedures for those scheduled operators of multiengine airplanes not currently subject to these inspections and procedures.
- Operator development of these procedures for the affected airplane models.

- Additional FAA inspections and records reviews mandated by Congress.

The FAA noted in its analysis that the attributed costs of this proposal do not include the expense of making repairs that may be found necessary during either an operator's damage-tolerance-based inspections or the FAA's oversight inspections. The FAA does not attribute these repair costs in the proposal because current regulations require that repairs be made as necessary to ensure the airworthiness of an airplane. Also, the FAA noted that its analysis did not address directly the costs the proposal eventually would impose on airplanes produced after the effective date of the rule.

The FAA identified two benefits in the proposed rule: (1) Age-related accidents would be prevented and (2) the FAA and the industry would be able to monitor the airworthiness of the affected airplanes as they age and either take timely corrective action to maintain their continued airworthiness or retire them from service before they become unairworthy; consequently, the airplanes would be able to stay in service longer because their continued airworthiness would be monitored, rather than the airplanes being retired at an arbitrary age.

Comments: Commenters generally believe the FAA underestimated the costs associated with this proposal. One commenter provided the following comments regarding the Initial Regulatory Flexibility Determination completed by

the FAA: In the "Compliance Assistance" section, the NPRM indicates the FAA has undertaken a research program to develop a simplified damage-tolerance-based methodology directly applicable to commuter-sized airplanes. The company states that if this document has not yet been issued, the FAA should consider withholding issuance of the final rule until such adequate guidance material is available.

FAA Response: In its efforts to assist small entities and other affected parties in complying with the rule, the FAA will publish two ACs for comment with this final rule. One of these is AC 91-56B, "Continuing Structural Integrity Program for Airplanes," and it will provide guidance for implementing a damage-tolerance-based SSIP. The other document is AC 91-60A, "The Continued Airworthiness of Older Airplanes," which will provide guidance for implementing a service-history-based SSIP. Notices of availability for these two ACs are published concurrently with this rule, with a request for public comments. The research referred to by the commenter has not yet been published. The document is in final review and will be published in the near future.

Comment: Additionally, the GAMA and other commenters contend the following statement is incorrect for "SIPs" developed using comprehensive fatigue analysis, fatigue tests, and the correlation of field service data, as applicable: "...non-damage-tolerance-based program would

induce lower costs but with a concomitant reduction in safety assurance" (64 FR 16314). Also, GAMA states this statement contradicts the FAA's assertion that the proposed rule does not increase the intended level of safety but maintains the level of safety established at type design (64 FR 16311).

FAA Response: The FAA maintains that damage-tolerance-based SSIPs provide the highest level of safety and that service-history-based SSIPs provide something less than that. In the NPRM, the FAA proposed that full damage-tolerance-based SSIPs be imposed on all affected airplanes after 2010. After reviewing the comments, the FAA had to consider the cost, the exceptional difficulty in obtaining the necessary data for airplanes with fewer than 9 seats, and the capability of the airlines operating these smaller airplanes to effectively accomplish these requirements. As a result of the review and based on the comments received, the FAA is revising the proposal to allow airplanes initially certificated with nine or fewer passenger seats to have service-history-based SSIPs.

Comment: The ATA estimates aligning HMCs with the inspections at 5-year intervals alone would cost more than $1.3 billion. According to ATA, one member states this alignment would add $21 million annually to its costs. Another ATA member asserts the proposal would require each airplane to be kept in heavy maintenance a minimum of 2 days longer than scheduled (compared with the FAA's estimate of

0.7 to 1.6 days). According to that operator, this additional time would result in $80,000 in lost revenue (compared with the FAA's estimate of 7 percent of the value of capital, or $2,700 per inspection). Another ATA member with 230 airplanes estimates the proposed rule would cost that operator as much as $150 million during each 5-year cycle and recommends the FAA consider a separate rule for part 121 operators of large transport category airplanes. Six ATA members representing more than 50 percent of the total domestic ATA fleet estimate the proposed rule would cost the group of part 121 operators of large transport category airplanes more than $236 million per year.

FAA Response: Based on the comments received, the FAA has changed the repeat inspection and records review interval from 5 years to 7 years to allow an operator to align the inspection and records review interval more closely with the scheduled HMC interval. This does not require the operator to have its HMC at the initial or repetitive limits set by this rule. The scheduled HMC can occur at any time within those intervals, and the FAA inspection and records review can be held concurrently with the HMC. The intervals shown in the rule are maximum intervals. In addition, it is not the FAA's intent to disrupt operators' scheduled maintenance in such a way that it would significantly impact their schedules. However, each airplane subject to the final rule cannot be returned to service after the specified interval until the

Administrator or a designee has completed its inspection and records review and notifies the operator accordingly.

With regard to cost estimation, a time estimate of 2 days per airplane inspection, as suggested by the commenter, was used in the final regulatory evaluation for the oversight inspection of an airplane by an ASI or DAR. This time estimate was used for the large transport airplanes that have damage-tolerance-based SSIPs (the great majority of the affected airplanes).

With regard to downtime costs, the FAA maintains that a reasonable approximation of the cost for the oversight inspection of an airplane by ASIs/DARs is the rate of return applied to the value of the productive capital asset used by the business enterprise (rather than revenue lost per day). Seven percent is the rate of interest that OMB directs agencies to use in present-value calculations. Moreover, such an approach has the advantage of being applied uniformly over the entire air carrier industry. By comparison, "revenue lost per day" varies considerably across companies in the industry and is affected by different accounting procedures. In addition, utilization rates vary across equipment. The FAA estimates the total cost to the industry where revenue lost by one firm is gained by another.

Calculations were made that resulted in estimates of intervals between C-checks and D-checks, in terms of years, for some large transport airplanes (including Boeing

models). These calculations showed that the C-checks take place, on the average, every 1 to 2 years depending on the airplane model type. D-checks are estimated to take place, on the average, every 5 to 12 years depending on the airplane model type. Thus, the initial inspection and records review (4 or 5 years after the effective date of the rule) could likely take place at a C-check; while the repeat inspection and records review, at 7-year intervals, could take place at a D-check or a C-check. In addition, those operators that use a segmented D-check schedule will have more opportunity to accommodate the initial and repeat inspections and records reviews. The increasing use of non-destructive inspection techniques should facilitate inspections at C- or D-checks.

Comment: One operator states the FAA assumption that only 50 percent of all fleets affected by the proposal would require modification is too conservative. The operator contends almost 100 percent of the fleets mentioned in the proposal would have to be modified to some extent. The operator further states the high costs of this modification would cause many operators to go out of business.

FAA Response: In the NPRM, the FAA's cost estimates for modifications included airplanes initially certificated with nine or fewer passenger seats (part 135), because they also were supposed to implement damage-tolerance-based SSIPs. This group of airplanes will now be required to implement service-history-based SSIPs. Consequently, the

number of airplanes needing modifications is reduced. However, there has been an increase in the number of part 121 airplanes needing damage-tolerance-based SSIPs since the publication of the NPRM.

Therefore, in the absence of substantiation to support the contention of the comment, the economic analysis keeps the 50 percent as a reasonable estimate.

Comment: Based on its own economic analysis of the effects of a 5-year fixed interval "on airplane" inspection with extensive additional access, one part 121 air carrier states the proposal would result in an increased maintenance expense of $404 million for that carrier's fleet alone. The carrier asserts this expense would affect future travel costs but provide no increase in passenger safety for part 121 operations.

FAA Response: Based on the comments received, the FAA has changed the repeat inspection and records review interval from 5 years to 7 years to allow the operator to align the inspection and records review interval more closely with the scheduled HMC interval (C-check or D-check).

Comment: One commenter states the FAA's cost impact analysis on air carrier records preparation does not account for the time carrier employees spend during the inspections and records reviews. The commenter notes that a carrier's employees would have to prepare the airplane records as

well as provide a support role during the inspections and records reviews.

Another commenter states the FAA failed to consider adequately the costs of reviewing each repair on each airplane, updating airplane structural repair manuals for damage tolerance repairs, and training professional engineering personnel in damage tolerance repair design.

FAA Response: In the NPRM and the final regulatory evaluation, there is cost estimation for personnel of the operator to prepare the airplane and its records for the inspection and records review by ASIs or DARs.

The FAA estimated the cost of damage-tolerance-based SSIPs per affected airplane, including repairs.

With regard to updating airplane structural repair manuals (SRMs), that cost should be minimal and it is included in the development and review cost. Several type certificate holders of large transport category airplanes have already updated their SRMs to include the results of damage tolerance assessments of repairs.

With regard to training professional engineering personnel, the commenter does not provide information as to the purpose of the training for professional engineers in damage tolerance repair design. The cost of engineering time to develop damage-tolerance-based SSIPs has been estimated using a fully burdened engineering rate of $95 per hour. This rate can be applied for engineering services (to develop the SSIP) provided by the type

certificate holder, a consulting firm, or the operator's own engineering personnel.

Comment: One part 135 Alaskan operator provided the following comments regarding costs of the proposed rule:

- The FAA expects operators to work with STC holders and the original airplane "manufacturer" to develop damage-tolerance-based supplemental inspection programs, which would require that each unique combination of type design and STC require a separate inspection program. The commenter therefore asserts the cost analysis is off by a factor equal to the number of unique type design and STC combinations for each type design.
- The FAA's estimate that 209 part 135 multiengine airplanes would be affected by this rule seems low. (ADOT&PF agrees, estimating that approximately 727 of the 3,198 airplanes in commercial service in Alaska would be affected (the airplanes not counted are single-engine airplanes). According to the ADOT&PF, almost all of these airplanes are more than 14 years old and none have a current damage-tolerance-based inspection program.)
- The commenter does not disagree with the FAA's reasons for excluding the costs of repairs that may result from an operator's damage-tolerance-based inspections or the FAA's oversight inspections;

however, because air carriers should maintain their airplanes in an airworthy condition, the new regulations are redundant.

- The enormous costs associated with the proposal would deplete the pool of funds available to maintain airplanes and limit the use and development of other more efficient initiatives that could improve aging airplane safety at a lower cost. The commenter cites two examples: (1) requiring replacement of all avionics and autopilot wiring after 25 years of service, and (2) requiring all commuter carriers to operate only under instrument flight rules.
- The proposed rule places the economic burden on operators, not "manufacturers" as stated in the NPRM. The operator notes the redundant expenses operators would incur in developing "SIPs."
- The operator questions the FAA's assumption that developing "SIPs" for related models would produce efficiencies. The commenter indicates operators would be unwilling to develop "SIPs" for models related to their own models. Furthermore, if an operator did develop a "SIP" that might be useful to other operators, the developing operator would be hesitant to transfer development information without charging a fee.

- The proposal underestimates the costs associated with developing damage-tolerance-based inspection techniques. According to the operator developing such techniques may (1) take more than 80 hours and (2) require extensive training for mechanics responsible for implementing the programs.
- The FAA's estimated 20-year annualized cost stream figure is misleading and inaccurate because operators would face costs sooner than 20 years. Furthermore, the economic analysis fails to consider costs beyond 2018.
- The economic analysis fails to consider that financing costs are particularly high for commuter operators.

FAA Response: The final rule excepts part 135 multiengine airplanes initially certificated with nine or fewer passenger seats from the requirement to incorporate damage-tolerance-based SSIPs. These operators are to implement service-history-based SSIPs in 2010. Also, the rule provides an exception for those airplanes operated between any point within the State of Alaska and any other point within the State of Alaska.

The final rule covers part 135 multiengine airplanes in scheduled service and the NPRM used a count of these airplanes. The commenter refers to a count of 727 airplanes as being in "commercial" service rather than in "scheduled"

service. A count of airplanes in "commercial" service includes scheduled and unscheduled operations.

The rule places the responsibility for developing the SSIP on the operators. However, the FAA anticipates that a number of type certificate holders will choose to support the development of the SSIP because it affects the future marketability of their airplanes. For those cases where a type certificate holder does not develop a damage-tolerance-based SSIP, the FAA anticipates that operators of a particular model will recognize the advantages of cooperating and jointly financing the development of a SSIP for that model. This can be done through the airplane type certificate holder or through an aviation engineering/consulting firm. Moreover, the final rule excepts part 135 multiengine airplanes initially certificated with nine or fewer passenger seats from implementing damage-tolerance-based SSIPs.

With regard to efficiencies in developing SSIPs, that factor was removed from the cost-estimating methodology in the final regulatory evaluation. With regard to charging a fee, such a fee can be charged. Then, the cost of developing a damage-tolerance-based SSIP can be shared by all the affected operators.

The development of a damage-tolerance-based SSIP was estimated in the NPRM to take between 10,000 to 25,000 hours. The 80 hours was an estimate of the time

needed for an operator to incorporate the damage-tolerance-based SSIP into its maintenance program.

With respect to training mechanics, it is not expected that airline mechanics will need additional training to do damage-tolerance-based inspections. Airline mechanics, through their training and work experience, already have the necessary skills to do such inspections. Most airlines have nondestructive testing capability already and it is only a matter of including those inspections in their maintenance or inspections programs.

The 20-year annualized cost does not mean that operators would not face costs sooner than 20 years. They will face costs sooner, and those costs have been incorporated in the economic assessment.

The period used to analyze the costs of the rule is a 20-year period. In the NPRM, the time period was 1999-2018. In the final regulatory evaluation, it is 2001-2020. If the period becomes longer than this (e.g., 2001-2025), the estimated (undiscounted) costs of the rule will increase.

The final rule contains relieving actions. Airplanes initially certificated with nine or fewer passenger seats have been excepted from damage-tolerance-based SSIPs and, instead, need to implement service-history-based SSIPs in 2010. The repeat inspections interval has been increased from 5 to 7 years. Finally, the FAA will make available advisory material through AC 91-56B and AC 91-60A. This material will be useful to small and commuter operators.

Comments: Commenters also note the FAA is unable to quantify the benefits associated with the proposed rule, thus the proposal seems unjustified. However, according to the GAMA, some reliable information on potential benefits associated with the proposed rule is available in the form of results compiled from the AATF program and other "manufacturer" programs where results have been shared with the FAA.

FAA Response: Based on the comments received, the FAA has revised the final rule to allow airplanes initially certificated with nine or fewer passenger seats to have service-history-based SSIPs. In addition, the FAA has decided to permit relief from the damage tolerance and SSIP requirements of this rule for airplanes operating between any point within the State of Alaska and any other point within the State of Alaska. This change is reflected in §§ 121.368(a), 121.370a(a), 135.168(a), and 135.422(a).

The FAA economic analysis provides a reasoned determination that the benefits of the rule justify the costs. The FAA and Congress believe that the risk of accidents does exist. This rule is expected to prevent aging aircraft accidents. The FAA and industry will be better able to monitor the aircraft airworthiness and thus comply with the AASA. This rule is expected to prevent potential aging-related accidents and to extend the airworthy life of affected aircraft.

Comment: One commenter asserts the FAA must provide for alternative inspection methods other than those based on damage tolerance criteria. According to the commenter, maintaining a damage-tolerance-based inspection and records program is administratively cost prohibitive, especially for smaller carriers. Also, the FAA has failed to demonstrate that such alternative approaches are less safe than damage-tolerance-based programs.

FAA Response: The FAA maintains that damage-tolerance-based SSIPs provide the highest level of safety and that service-history-based SSIPs provide something less. In the NPRM, the FAA proposed that full damage tolerance inspections be imposed on all airplanes after 2010. After reviewing the comments, the FAA had to consider the cost, the exceptional difficulty in obtaining the necessary data for fewer than 9 seats, and the capability of the airlines operating these smaller airplanes to effectively accomplish these requirements. As a result, based on the comments received, the FAA is revising the proposal to allow airplanes that were initially certificated with nine or fewer passenger seats to have service-history-based SSIPs.

Comment: This commenter, who operates deHavilland DH-6 Twin Otter airplanes, presumes that deHavilland would not fund a damage-tolerance-based program for the Twin Otter because the airplane has been out of production since 1988. The commenter also presumes that for liability reasons,

deHavilland would not provide the necessary engineering and test data upon which a damage-tolerance-based program would be developed by operators of that airplane. Therefore, the commenter asserts it would have to retain a company such as Structural Integrity Engineering to develop its damage-tolerance-based "inspection program." According to the commenter, Structural Integrity Engineering reports that the commenter should expect to spend between $500,000 and $600,000 on the analysis and an additional $250,000 in flight testing to validate flight loads and other criteria.

Because of these liability concerns, the commenter would not sell its damage-tolerance-based "inspection program" to other DHC-6 operators as a means of defraying the initial investment of at least $750,000. In addition, because more of its customers cannot afford to maintain personnel trained and certified in ultrasonic inspection techniques, the commenter would have to add additional personnel and keep them qualified to support its customers. According to the commenter, its "lease rents" would decline in proportion to increased maintenance costs. The commenter states it cannot place a cost on a reduction in rents or in how that income loss could reduce DHC-6 hull values. However, the commenter estimates it would cost at least $100,000 per year in additional personnel costs for the commenter and potentially reduce the DHC-6 hull values by between $400,000 and $500,000 (a total of $15.6 to $19.5 million for the commenter's fleet of 39 DHC-6s).

FAA Response: The FAA recognizes that operators are responsible for the development of their inspection programs. However, the FAA expects type certificate holders to support the operators in the development of those programs. This should be particularly likely when the type certificate holder is still producing a particular airplane model, which is the case for the great majority of the affected airplane models. Operators of an airplane model also may engage and fund the type certificate holder of the airplane to develop a damage-tolerance-based SSIP. In the event that a type certificate holder chooses not to support the airplane, and if the operator is unable to economically justify the development of the damage-tolerance-based inspections, along with other operators of the same model, the airplane will be ineligible for operation in scheduled service in the United States.

Comment: An Alaskan operator obtained an estimate to develop a "SIP" for PA-31-350 airplanes and was advised that without the original design data from the "manufacturer," the cost would approximately double. For an airplane no longer in production, there is no incentive for "manufacturers" to voluntarily provide such data to the operator; it only extends their liability. The commenter alleges that "manufacturers" have strong incentives to impede the development of cost-effective "SIPs" for out-of-production models because withholding data would force airplane retirements and generate demand for new airplanes.

FAA Response: Based on the comments received, the FAA is revising the proposal to allow airplanes initially certified with nine or fewer passenger seats to have service-history-based SSIPs, which includes the PA-31-350. However, for airplanes initially certificated with 10 or more passenger seats, a damage-tolerance-based SSIP is required to ensure the continuing airworthiness of these aircraft.

Fairchild has developed a damage-tolerance-based SSIP for its Metro aircraft. However, the FAA realizes that other type certificate holders may choose not to support the development of SSIPs and that this may lead to the retirement of certain airplanes. The FAA notes that each operator, not the type certificate holder, is responsible for ensuring the continuing airworthiness of its aging aircraft.

International Trade Considerations

One international operator submitted a comment on the International Trade Impact Analysis completed by the FAA. The operator states-

- In encouraging foreign governments to adopt this proposal, the FAA must accept the inspection and review findings of those governments without further FAA-approved review or inspection. The operator indicates the CASA probably will adopt this NPRM; therefore, incurring costs for non-U.S.-registered fleets.

- The international trade impact analysis is underestimated. The NPRM could affect international trade if restrictions apply to the importation of second-hand airplanes into the United States.

Another international operator noted that the proposal will have an effect on foreign trade by increasing operating costs for foreign operators of U.S.-registered aircraft due to the additional costs associated with compliance with this rule.

FAA Response: The commenter's assertion that the FAA must accept the inspection and review findings of foreign governments without further FAA-approved inspection and review is erroneous. The FAA agrees that if another country adopts this rule, it will impact airplanes registered in that country; however, that cost is not a direct cost of this rule.

The rule applies to all affected U.S.-registered airplanes. It does not apply to non-U.S.-registered airplanes. The FAA notes, however, that any U.S.-registered airplane will be subject to the requirements of this rule whether it is purchased from a seller in a U.S location or from a seller in a foreign location. Owners of foreign-registered airplanes seeking U.S. registration and prospective owners of such airplanes are aware of the need to comply with applicable U.S. regulations and should take these requirements into account before attempting to transfer a foreign-registered aircraft to the U.S. registry.

It is their responsibility to ensure that an aircraft imported into the United States complies with current U.S. regulatory requirements.

Editorial Comments

Summary of Proposal/Issue: Several commenters addressed editorial items related to the proposed rule.

Comments: Commenters recommend that the FAA-

- Correct the appendix references in § 135.168 to read "appendix G."
- Correct the appendix references in § 121.370a to read "appendix N."
- Better define what is meant by the term "age-related fatigue damage." The EAAWG asks whether the term means corrosion fatigue or refers to the more conventional understanding of damage resulting from repeated cyclic loading.
- Better describe what is meant by "fatigue." According to the EAAWG, the description of this term in the Description of Benefits section of the preamble to the proposal implies fatigue may be something other than cracking, although cracking is the specific concern of the proposal.
- Reconsider the use of the term "supplemental" to refer to inspections in §§ 121.370a, 129.16, and 135.168. According to the CASA, whether inspections are supplemental or integral to the

basic maintenance program is irrelevant. Also, the CASA states these inspections increasingly would become integral rather than supplemental.

FAA Response: The term "age-related fatigue damage" is damage resulting from repeated cyclic loading, not from corrosion. "Fatigue" is related to cracking only. The FAA disagrees with the comment on the use of the word "supplemental." Such inspections are supplements to the normal maintenance program, and the use of the term "supplemental" is accepted by the industry and is used in FAA advisory material.

The FAA also has corrected the appendix references in §§ 121.370a and 135.16.

Other Issues

Part 23 Airplanes

Comments: The NATA recommends that the FAA suspend the proposed rules for scheduled part 135 air carriers operating part 23 airplanes initially certificated with nine or fewer passenger seats. According to the NATA, currently there are no systemic structural problems in these airplanes that require implementing damage-tolerance-based inspections. The NATA proposes to assist the FAA in conducting evaluations of current inspection and maintenance requirements for these airplanes to determine whether an unsafe condition exists.

The NATA proposes a different method of addressing aging concerns for part 23 airplanes initially certificated with nine or fewer passenger seats certificated before 1993:

- The FAA should identify airplanes for which damage-tolerance-based inspections have been developed and approved by the FAA.
- The FAA should identify airplanes for which the "manufacturer" has developed a SSIP or a supplemental corrosion inspection program.
- For any airplane not covered by the above provisions, the FAA should develop a special inspection to enhance the scheduled periodic/annual inspection currently required. The inspections should be developed through the use of structural difficulty reports and other such reports available to the FAA.
- The owner/operator of any affected airplanes in air carrier service should be required to implement, no later than 14 years after the date of manufacture, a SSIP designated by the "manufacturer." If the "manufacturer" has not designated such a program, the operator should be required to implement the FAA's SSIP.

FAA Response: The FAA disagrees with the suggested changes to the rule. However, based on the comments received, the FAA has amended the final rule to specify that

airplanes initially certificated with nine or fewer passenger seats can accomplish service-history-based SSIPs instead of damage-tolerance-based SSIPs as proposed in the NPRM.

New Rulemaking Mandating CPCP and Other Programs

Comments: One commenter proposes that the FAA initiate a new rulemaking to mandate structural integrity programs and CPCPs instead of AD action supplemented with structural and corrosion reliability programs for airplanes with non-damage-tolerance-based "inspection programs."

FAA Response: The FAA agrees and is considering rulemaking to impose CPCPs for the same fleet of airplanes as is covered by this rule.

Operations Specifications

Comments: One operator proposes an aging airplane program that would function through amendments to operations specifications. Under this program, an operator's quality department would have responsibility for records reviews, airplane inspections, and reporting of results. Also, the FAA could focus on providing oversight through sampling or unannounced inspections and records reviews.

FAA Response: The FAA disagrees. The inspection programs must be approved by the FAA ACO or office of the Small Airplane Directorate or Transport Airplane Directorate responsible for each airplane's type certificate. The final rule has been revised to reflect this approval requirement.

Once approved, each air carrier's operations specifications can be revised to include these inspections in each airplane's maintenance or inspection program.

DAR Services

Comments: A number of commenters state that the FAA underestimated the cost for DAR services. One commenter states that the increased inspection and DAR costs would add significantly to the costs per flight hour for low utilization operators.

Another commenter indicates he has been a DAR since 1983 and generally charges $125 per hour for services performed (based on appendix A to part 187, Methodology for Computation of Fees for Certification Services Performed Outside the United States, and AC 187-1, Flight Standards Service Schedule of Charges Outside the United States). The ATA estimates the costs of hiring a DAR would be no less than $100 per hour, compared with the FAA's estimate of $55 per hour.

Other commenters worry that the operator would have to bear the costs of the DAR inspections and records reviews. One operator states that some FAA offices routinely direct operators to seek the services of a DAR whenever the task can be accomplished by a DAR, indicating the FAA office is too busy.

FAA Response: The FAA has established that the benefit of doing the inspections and records reviews outweighs the

associated costs of using DARs to accomplish these tasks. However, the FAA will establish policy on how DARs will be used, and the FAA has revised the regulatory evaluation to reflect the cost of DAR services.

In the NPRM cost calculations, the FAA used $95 per hour for the burdened hourly wage of DARs. The FAA used $55 per hour for other types of skills. In the cost calculations of the final regulatory evaluation, the FAA used $100 per hour for the burdened wage rate of DARs. With regard to the availability of FAA inspectors, the cost-estimation methodology recognizes the possible obstacles with the supply and availability of FAA inspectors, and has consequently assumed that 60 percent of this cost will be for the use of DAR services and 40 percent will be for the use of FAA inspector services. The total cost of the rule remains the same.

Regulatory Evaluation Summary

Changes to federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreement (19 U.S.C. section 2531-2533) prohibits agencies from setting standards that create unnecessary obstacles to the foreign

commerce of the United States. In developing U.S. standards, this Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. And fourth, the Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by state, local or tribal government, in the aggregate, or by the private sector, of $100 million or more in any one year (adjusted for inflation).

In conducting these analyses, the FAA has determined that this rule: 1) has benefits which do justify its costs, is a "significant regulatory action" as defined in the Executive Order, and is "significant" as defined in DOT's Regulatory Policies and Procedures; 2) will have a significant impact on a substantial number of small entities; 3) will have a neutral impact on international trade; and 4) does not impose an unfunded mandate on state, local, or tribal governments, or on the private sector. These analyses, available in the docket, are summarized below.

INTRODUCTION

This rule represents a critical step toward compliance with the Aging Aircraft Safety Act of 1991. Section 44717 of Title 49 instructs the Administrator to "prescribe regulations that ensure the continuing airworthiness of aging aircraft" and to "make inspections, and review the

maintenance and other records, of each aircraft an air carrier uses to provide air transportation."

Consistent with Section 44717 of Title 49, the purpose of the rule is to ensure the continuing airworthiness of aging airplanes operating in commercial air transportation. The implementation of this rule ensures that: (1) modern damage-tolerance analysis and inspection techniques will be applied to older airplane structures that were certificated before such techniques were available, and (2) the FAA will conduct mandatory aging-aircraft inspections and records reviews.

Since the publication of the NPRM, the FAA made changes to the final rule consistent with the enabling legislation to ensure the airworthiness of aging aircraft, while factoring in public comments about the economic consequences. The net effect is that all operators have more time to be in compliance with this rule and that operators of smaller aircraft implement less rigorous inspections. Despite these cost-reduction factors, the estimated total cost of the rule is higher than that initial regulatory evaluation, due to cost adjustments resulting from information provided by the industry.

Differences Between the Current Rules and the Aging Rule

There is strong evidence that the current system of maintenance inspections is not working effectively in the detection, and repairing, cracks on airplanes during regular maintenance inspections, while these cracks are still small. This section discusses the differences

between the current rules and the aging rule in order to show the focused emphasis of the aging rule toward the early detection of cracks.

There are significant differences between the requirements under current rules for aircraft inspection/maintenance and the new requirements of the "Aging Airplane Safety" rule. Under current operation rules - with an exception[1] - there are no requirements for operators to accomplish a damage-tolerance based inspection program for any airplane; however, the FAA has mandated DT-SSIPs for large transport airplanes by the use of ADs. These ADs are applicable to the operators. The manufacturers agreed to provide DT-SSIPs to the operators. However, there is no rule mandating this, and it has been taking a long time for the manufacturers to develop the DT-SSIPs. Consequently, for some airplane models, there are various degrees of implementation of damage-tolerance-based standards, while for other airplane models, there is still no such implementation. For example, for the Boeing 757 and 767 models, it took 18 years for DT-based SSIPs to be implemented. The MD-80 model still does not have an implemented DT-based SSIP - after 18 years.

Currently, the inspection programs of small transport airplanes (such as DeHavilland/DHC-6) are not damage-tolerance based. Parts of these airplanes were certificated to either safe-life or fail-safe requirements.

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[1] That exception is the recently implemented rule on "Repair Assessment for Pressurized Fuselages," which requires damage-tolerance assessment of repairs to the fuselage pressure boundary of eleven aging, large transport airplane models.

Under existing programs, that use these requirements, there are no provisions for inspections specifically focused on cracks. These inspection programs (which are provided by the original equipment manufacturer) involve a general visual inspection, but the mechanics may never look in areas that are hard to inspect visually - such as the horizontal stabilizer.

In contrast to the current situation/rules, this final rule will require DT-based SSIPs within a reasonable length of time (4 years) after the effective date of the rule - so that all (part 121) transport airplanes will have DT-based SSIPs applicable for each model. Damage-tolerance standards emphasize inspections and procedures to detect cracks at an early stage. These cracks can then be repaired. By contrast, the current inspection and maintenance programs of airplanes do not place special emphasis on cracks. Under the current system, the finding of cracks depends more on the quality of the particular mechanic doing the inspection, and on the particular inspection programs adopted by different airlines (or repair stations). Consequently, there is considerable variability in the detection of these cracks, across the U.S. commercial airplane fleet.

The damage-tolerance-based program uses both non-invasive and invasive techniques to detect cracks on airplanes. By contrast, the current non-DT-based programs use simpler and fewer non-invasive techniques, and they do not use invasive techniques at all. The damage-tolerance-based program uses (new) non-invasive technology - such as eddy current, ultrasonic waves, and magnetic particle

inspections - to detect cracks, particularly small cracks. The existing non-DT-based maintenance programs do not require the use of these techniques; eddy current is used only if it is mandated by an AD for a previous cracking problem.

Also, DT-based SSIPs implement inspections for fatigue "hot spots" - that is, areas on the aircraft where cracks may develop. In this way, it will be possible for an airline to detect and follow the progress of these spots, or potential cracks, and repair them promptly.

With regard to invasive techniques, the damage-tolerance-based inspections and procedures will mandate that operators of the affected airplanes inspect - by invasive techniques - in areas where that they probably would not have inspected before, such as the horizontal stabilizer. To get access to the stabilizer, operators may have to install access doors. Inside the horizontal stabilizer, there are ribs and spar caps that are covered by airplane skin. These components can crack without being detected by an inspection from the outside. A crack in a horizontal stabilizer can result in the loss of control of the aircraft - and lead to an accident.

The comprehensive status of the U.S. airplane fleet with regard to cracking is fairly unknown. It is known that the fleet is aging and the metal of airplanes' structures is accumulating more flight cycles, resulting in an increasing risk of fatigue cracks and a catastrophic airplane accident. The current ad hoc approach relies heavily on airplane mechanics reporting cracks from visual inspections (leading to repairs). These inspections have

resulted in the discovery of large cracks. If/when the discovery of cracks is deemed to be a serious problem, the FAA issues an AD for a particular model (and part of the airplane). In contrast to the current ad hoc approach, this rule will require all commercial airplanes to have damage-tolerance based SSIPs which include directed inspections for cracks.

BENEFITS

The purpose of this rule is to play a key-role in assuring the continued structural airworthiness of air carrier airplanes as they continue in service. The rule puts into place one integral part of the FAA's "Aging Aircraft Program", initiated in 1988, to address the unique problems associated with older airplanes. This initiative was undertaken because significant numbers of air-carrier airplanes were, and are, continuing to operate beyond their original design service goals. The Aging Airplane Program was launched with participation by airplane operators and manufacturers, and with the specific goal of identifying maintenance procedures that are necessary beyond current requirements to deal with the phenomena of aging materials.

After an extended period of working with industry's Airworthiness Assurance Task Force and the Airworthiness Assurance Working Group within the Aviation Regulatory Advisory Committee (ARAC), the FAA has concluded that four distinct areas of airplane aging need to be individually addressed. These areas are (1) fatigue cracking, (2) corrosion, (3) damage tolerance of structural repairs, and

(4) widespread fatigue damage. Protection from fatigue cracking is the most generalized of these four areas, and was the first area of focus by the FAA. The agency issued a notice of proposed rulemaking on fatigue cracking on April 2, 1999, entitled "Aging Airplane Safety".

Structural properties of materials change as a result of prolonged and/or repeated application of stress cycles on those materials. After some duration of cyclic stress, the material will fail under the applied load because of fatigue. One manifestation of fatigue in materials is cracking. In principal-structural elements of the airplane, cracking due to fatigue can result in a catastrophic failure of the aircraft. Left unchecked, it is not a question of whether the repeated loadings on aircraft will produce a major structural failure but, rather, when that failure will occur. At the time when the NPRM for this final rule was published, more than 29 percent of the airplanes affected by that proposal were already 20 years old or older; 14 percent were over 30 years old; and 7 percent of the airplanes were over 40 years old. The average age of the U.S. airplane fleet has increased, in recent times, from 13.3 years in 1995 to 14.2 years in 1999 (even with retirement of older airplanes).

There is growing evidence of significant occurrence of fatigue cracks on airplanes and the potentially dire consequences of such cracks. This evidence includes: 1) the accident of the Aloha Boeing 737-200, on April 28, 1988, when 18 feet of upper fuselage separated from the airplane in flight; and 2) the substantial, accumulated data showing the development of significant numbers of

cracks on airplanes. In the Aloha accident, the National Transportation Safety Board determined the probable cause of the accident to be metal fatigue and corrosion. In addition, many cracks have been found over time on airplanes, including some that are quite long - thus, increasing the risk of accidents. These cracks are typically the result of fatigue from aging. The evidence of significant risk of airplane accidents as a result of cracks is described below, and includes: 1) a relative risk assessment, followed by 2) the record of Service Difficulty Reports, and ending with 3) a discussion of the Airworthiness Directives issued on fatigue and cracking for the U.S. commercial fleet.

Relative Risk Assessment

This benefit analysis provides an estimate of the increasing relative risk of accidents over time, based upon existing data and some conservative assumptions. The FAA believes that the analysis results in a reasonable estimate of how much the accident risk, due to fatigue cracking, increases over time with aging aircraft, in the absence of the rule. The analysis is not an estimate of actual future accidents.

To date, the airplane fleets affected by this rule have not experienced a fatigue-related accident, resulting in loss of life or serious injury, although the Aloha accident (mentioned previously) was partly attributed to the age of the airplane involved. The Aloha accident was followed by a series of ADs, on operators, whose successful implementation depended on the voluntary development of DT-SSIPs by manufacturers. The development of these DT-SSIPs

has been taking a relatively long time, and is still not completed. Moreover, numerous instances of serious cracking have been discovered among the fleet even during currently-required inspections that do not systematically investigate for fatigue cracking, as is required by this rule. This suggests that a fatigue problem does exist. An attempt is made here to provide an estimate of the magnitude of that problem - now and in the future.

Based upon extensive testing, it is common engineering practice to assume that materials fail from fatigue according to a normal probability curve. The "mean" or highest point of the bell-shaped normal curve denotes the point at which half of the test samples have failed; or, stated another way, that is the point where the probability that any one sample will have failed is one-half. Engineers often define "Safe life" as outside three standard deviations of the curve, to the left of the mean.

An airplane is made up of a great many different and independent elements, each with its own failure characteristics. Consideration of the probabilities of time-to-failure resulting from fatigue for an entire airplane can be analyzed in terms of a normal distribution. The Central Limit Theorem allows the useful assumption that a plot of the means, of the various times-to-failure of a sufficient number of samples of individual parts of an airplane, will approximate a normal distribution, without regard to the actual underlying distribution of various times-to-failure of the parts. Using this approach, it can

reasonably be assumed that in the absence of some preventive action, the fleet of aircraft affected by this rule would experience fatigue failure according to an approximately normal distribution curve. This analysis makes such as assumption. A normal curve is defined by its mean and standard deviation, and unfortunately neither of those numbers is known for the fleet of affected airplanes. As a result, a reasonably accurate failure curve cannot be constructed.

However, by making some conservative assumptions, a curve of relative failure risk may be developed that could yield some useful indications. The relative risk curve would be identical to the actual failure curve if the failure curve could be identified. Therefore, the relative risk curve is also assumed to be approximately a normal distribution. The mean and standard deviation of this curve are also unknown. However, for the purpose of discussing relative risk, it is assumed that the mean of the relative risk curve is 50 years of age. That is to say, the probability of fatigue failure risk reaches 50 percent at age 50, if no preventive action is taken. If the curve under discussion were an actual failure curve, it would mean that one-half of the fleet would have experienced fatigue failure by age 50 if no preventive actions were taken.

For the purpose of discussing relative failure risk - not actual failure risk - it is assumed that the point of three standard deviations on the risk curve (to the left of the mean) occurs at the age of 14 years. This matches the statutory requirement and the requirements of this rule

that additional preventive actions be initiated at that time. Three standard deviations matches the often-used engineering convention that a component is "safe" outside that point (to the left of the mean).

The curve is defined with a mean of 50 years and a standard deviation of 12 years [(50-14)/3]. Interpolating from a standard normal probability table, the probabilities associated with such a curve by aircraft age are shown in Table 1. As previously stated, available data are not sufficient to claim that this table shows the fraction of the fleet that would experience fatigue failure with age, in the absence of this rule, but it may be a reasonable indicator of relative risks of failure for individual aircraft.

A very small risk of failure occurs by age 14 years (0.001), as shown in Table 1. By age 22, however, the relative risk is ten times greater - one order of magnitude (at 0.01). By age 35, the risk of failure is one-hundred times greater, than that at age 14 - two orders of magnitude (at 0.1). If the maximum, acceptable "safe life" risk occurs when an airplane reaches the point of three standard deviation from the mean, at 14 years of age, then this analysis indicates that this maximum acceptable risk is exceeded by one order of magnitude by age 22, and two orders of magnitude by age 35.

A similar tabulation was done for relative probabilities of fatigue failure if the mean is assumed to be 62 years, instead of 50 years. (62 years, instead of 60 or 65 years, was selected simply for ease of interpolation from the standard normal curve table.) In this case, the relative risk increases by one order of

magnitude when an airplane reaches age 25 and two orders of magnitude by age 42.

Although the above brief risk analysis is not precise and depends upon assumptions that could be varied, it does provide an idea of how the risk to aging aircraft increases over time. From this analysis, there is no question that over the years, the risk of fatigue failure for an airplane's structural parts increases. When the above analysis is applied to the fleet of airplanes affected by the rule, there is a strong indication that the level of safety from fatigue crack accidents has significantly declined. The analysis suggests that in the absence of the action proposed by this rule, the accident risk has increased beyond "safe life" by one order of magnitude when an aircraft reaches around 22 to 25 years of age. Over 25 percent of the fleet has reached or exceeded that age range. Further, the analysis suggests that the accident risk has increased to two orders of magnitude, beyond "safe life", in the 35 to 40 years of age range. Over 10 percent of the fleet has reached or exceeded that range.

Table 1

RELATIVE RISK OF FATIGUE-CRACKING ACCIDENT, WITH AGE

(Mean = 50 years)

Age (Years)	Relative Risk	Age (Years)	Relative Risk
14	0.0013	33	0.0793
15	0.0018	34	0.0918
16	0.0023	35	0.1056
17	0.003	36	0.123
18	0.0039	37	0.1401
19	0.0049	38	0.1587
20	0.0062	39	0.1814
21	0.008	40	0.2033
22	0.0099	41	0.2266
23	0.0122	42	0.2546
24	0.0154	43	0.281

25		0.0188		44		0.3085
26		0.0228		45		0.3409
27		0.0281		46		0.3707
28		0.0336		47		0.4013
29		0.0401		48		0.4364
30		0.0485		49		0.4681
31		0.0571		50		0.5
32		0.0668				

Service Difficulty Reports

A review of Service Difficulty Reports (SDRs) shows that a significant problem exists with cracks on airplanes in the U.S. commercial fleet. SDRs are reports that provide information on the incidents (as opposed to accidents) of airplanes related to maintenance problems. The reports are typically completed by airline (or repair station) mechanics, and are then sent to, and collected by, the FAA. An objective of the submission and collection of SDRs is to track problems with aircraft parts and components. The findings of SDRs can lead to the issuing of airworthiness directives (ADs), when conditions observed are deemed to create a significant, adverse effect on air-transport safety.

The FAA searched the National Aviation Safety Data Analysis Center (NASDAC) for service difficulty reports since 1990 - for part 121 airplanes - using three keywords: "crack", "aging", or "fatigue". The search resulted in over 94,000 records or SDRs. Of these, about 93 percent, or 88,000 SDRs, were on "cracks" (while the remaining were

on "corrosion"). Eighty-eight thousand records are a significant number of problems involving aircraft cracks. These cracks were found on all the main parts of the airplane structure: fuselage, wings, and doors (of both passenger and cargo airplanes). Therefore, this assessment of SDRs shows a wide prevalence of cracks on U.S. commercial airplanes.

Airworthiness Directives

Airworthiness Directives (ADs) are issued when serious problems with airplanes are discovered that - if not repaired - have a high likelihood of resulting in an accident. So, ADs are issued quickly in order to maintain the airworthiness of the affected airplanes and thus prevent accidents. Given the threat of an accident, when an AD is issued, operators have a limited time to resolve the problem and often require unscheduled maintenance.

A tabulation was made of ADs issued by the FAA for problems with airframe "fatigue" and "cracking" - for a recent period of less than one year: January 1 through September 2000. The results show that 56 such ADs were issued by the FAA over that time period. These ADs apply to various parts of the airplane structure and these parts include: fuselage, wings, door frames, deck floor beams, etc. A count of the affected parts indicates that:

1) 10 ADs were issued for cracks found on the fuselage skin;
2) 9 ADs were issued for cracks on wings;

3) 8 ADs were issued for cracks found on, and around, doors.

4) 8 ADs were issued for cracks found on (and around) bulkheads.

5) 2 ADs were issued for cracks found on the tail assembly (which includes the horizontal and vertical stabilizers, and rudder).

These Airworthiness Directives on cracks, also, affect all of the well-known airplane models. They include: Aerospatiale, Airbus, Boeing, Bombardier, British Aerospace, Dornier, Fairchild, Fokker, Lockheed, and McDonnell Douglas. Also, some of these ADs affect an entire airplane series. For example, an AD applies to the Airbus A-300 Series, while another AD refers to the Boeing 727 Series. Still another AD applies to the Boeing 737-200C Series, the Boeing 747 Series, and the Boeing-777 Series.

If cracks are left undetected - and, thus, untreated - they grow. Subsequently, they can result in accidents. With regard to crack sizes and growth of cracks, one can refer - as an example - to the "Airworthiness Directive; Boeing Model 747 Series Airplanes", Final rule; request for comments (Docket No. 2000-NM-206-AD). In the text of this AD, it is pointed out that "The FAA has received reports that, during regular maintenance of certain Boeing Model 747 series airplanes, operators detected cracking of certain areas of the fuselage skin adjacent to the drag splice fitting. One operator reported finding four skin cracks, which ranged in length from 0.19 to 1.37 inches, under the drag splice fitting of the right side underwing.

On another airplane, there was detection of a 8.5-inch long crack under the drag splice fitting of the left side. Moreover, another operator found a 25-inch long diagonal crack between station (BS) 982 and BS 990 at stringers 37L through 38L." These data show the existence of different-size cracks found on different airplanes (of the same airplane model). The cracks (in this particular case) range in size from 0.19 inches to 25 inches. Therefore, these data indicate that under current inspection/maintenance procedures, which are not based on damage-tolerance standards, cracks have gone unnoticed and have become quite large.

The text in the same AD goes on to emphasize the serious, potential consequences of cracks. It states that "Such conditions, if not corrected, could result in reduced structural integrity of the fuselage, and consequent rapid depressurization of the airplane." Depressurization means that the fuselage of the aircraft is breached and that can result in an accident. When a fuselage is under pressure, if a crack gets long enough, it will fast fracture.[2] When a crack fast fractures and is not arrested, the fuselage will experience a rapid depressurization event. Rapid depressurization can result in a number of serious adverse effects on the airplane and passengers. At best, after the airplane has suffered depressurization, the passengers ride in an unheated aircraft, breathe through oxygen masks, and hope for a safe landing. Another possible result, however,

[2] When a crack fractures at a rapid rate. A cleavage fracture may run as fast as 1 mile/second (1600 meters/second), a dimple fracture as fast as 1500 feet/second (500 meters/second), although it may be slower.

is an airplane accident. There are examples of catastrophic accidents occurring as a result of rapid depressurization; these accidents were not caused by cracks but they show the dire consequences of rapid depressurization. In one accident, in 1974, a DC-10 operated by Turkish Airlines, lost a door and had rapid depressurization. This caused the floor of the airplane to move and sever control cables - with catastrophic results. The accident killed 246 people. In another accident, in 1985, a B-747 operated by Japan Airlines experienced a failure in the aft pressure bulkhead (from a bad repair). This affected the control system and the airplane crashed in a mountain - killing 524 people. It was very fortunate that the Aloha accident resulted in only one fatality.

Therefore, cracks are a serious airworthiness problem, as evidenced by the necessity to issue numerous ADs. These cracks have affected critical parts of the entire airplane structure across all the airplane types used in commercial aviation. The use of ADs is meant to address a specific problem during a specific time period. It is not an effective way to address a widespread problem that affects the entire U.S. commercial airline fleet - such as cracks. The "Aging Airplane Safety" rule provides a comprehensive and effective way to address that problem.

In sum, it is accepted that after some duration of cyclic stress, metal will fail under applied load because of fatigue. From the relative risk assessment discussed above, it is clear that risk of metal fatigue increases by orders of magnitude as the airplanes age. Since 1990, there are over 88,000 airplane service difficulty reports

that identify cracks found on all the main parts of airplane structure. There is not only abundant evidence of pervasive cracking in airplanes, but also many of these cracks have led to airworthiness problems. These risks are not acceptable. The FAA concludes that action must be taken to avoid this unacceptable risk. The inspections and records reviews required by this rule are expected to achieve the goal of maintaining an acceptable risk from fatigue cracking accidents.

COSTS

Differences Between Costs of the NPRM and Final Rule

There are several differences between preliminary regulatory evaluation of the NPRM and the final regulatory evaluation of the rule. Some of these differences reduce the costs of the rule, while others increase these costs. The net effect is for the estimated costs in the final regulatory evaluation to exceed substantially the costs estimated in the NPRM. These changes are explained in more detail below.

The following changes from the NPRM to the final rule, based on information from public comments, reduced the cost of some requirements of the rule:

1) The time between repeat intervals was increased from 5 years to 7 years - in order for the required inspections to be better accommodated by the schedule for heavy maintenance checks.

2) For airplanes that will be 25 years or more on the rule effective date, the time interval for the initial inspection was increased from 3 to 4 years.

3) In the final rule, operators of Part 135 airplanes are exempt from damage-tolerance inspections. Instead, they only need to implement a service-history based SSIP - and that by 2010.

4) In the final rule, operations within Alaska are exempt from the rule's requirements.

Despite the above factors that reduced costs, the estimated total cost of the rule in the final regulatory evaluation is significantly greater than the total cost of the rule estimated in the NPRM. This increased cost was affected by the following factors:

1) The number of affected airplanes was higher in the final regulatory evaluation. The number of part 121 airplanes that need DT SSIPs increased from 925 in the NPRM to 1,596 in the final regulatory evaluation.

2) For part 121 airplanes that have DT SSIPs, the cost estimation in the final rule increased the downtime for FAA/DAR inspections and records review to 2 days.

3) In the final regulatory evaluation, efficiency factors were not applied in the writing/development of damage-tolerance-based SSIPs.

4) The average airplane values used in the final regulatory evaluation were higher than those used in the

preliminary regulatory evaluation. This results in increased downtime costs.

As a result of the above changes, the total estimated cost of the rule increased from $99.6 million in the NPRM to $173.5 million in the final rule - in present value. The cost of the part 135 operators declined from $8.5 million to $1.7 million, in present value.

Also, with respect to the distribution of the cost for inspections/records review by FAA inspectors/DARs, in the final regulatory evaluation it was assumed that 60% of this activity will be conducted by DARs, while 40% will be conducted by FAA inspectors. In the NPRM, the cost methodology assumed that the cost of this activity would be shared 50%-50% between FAA inspectors and DARs. Consequently, the methodology of the final regulatory evaluation increased the cost of this activity for the operators.

he rule will affect the operators of airplanes under Part 121 that currently have (or are expected to have by 2004) damage-tolerance-based SSIPs incorporated into their maintenance program. In addition, those operators of airplanes under Part 121 that are not currently required to incorporate a damage-tolerance-based SSIP into their maintenance program will need to develop such a program. The rule will also generate costs for operators of multi-engine airplanes that are operated in scheduled service under Part 135 and initially certificated with 10 or more passenger seats. These operators are required to develop and implement damage-tolerance-based SSIPs by the year

2010. Many of the airplanes in this group have moved over time into Part 121; consequently, their costs are measured through the Part 121 airplane list.

The rule will also generate costs for operators of multi-engine airplanes that are operated in scheduled service under Part 135 and initially certificated with 9 or fewer passenger seats. These operators are required, by the final rule, to develop and implement service-history-based SSIPs by the year 2010. Service-history-based SSIPs have considerably lower costs than damage-tolerance-based SSIPs. In the NPRM, the proposed rule required that the operators of these airplanes also implement damage-tolerance-based SSIPs. However, as a result of public comments and additional consideration, this final rule exempts those airplanes from damage-tolerance-based SSIPs and, instead, requires the lower-cost service-history-based SSIPs.

The estimated costs of this rule do not include the expenses of making repairs to airplanes that may be found necessary during either the SSIP-directed inspections, conducted by the airplane mechanics, or the oversight inspections conducted by the FAA inspectors or DARs. While the FAA recognizes that such repairs can sometimes constitute a considerable expense, the costs of these repairs are not attributable to this rule because existing FAA regulations require that repairs be made to assure the continued airworthiness of the airplane.

Also, the economic evaluation focuses on existing airplanes and does not address the costs that the rule will eventually impose on newly-produced airplanes. The

requirements of this rule on newly-produced airplanes are beyond (or nearly so) the 20-year time period of this study. Consequently, these costs, particularly their present value, are expected to constitute a relatively small proportion of the costs calculated in this study.

Costs for Part 121 Airplanes that Have Damage-Tolerance-Based SSIPs

For those part 121 operators that have (or will have by 2004) a damage-tolerance-based SSIP, the rule will not impose costs for damage-tolerance-based inspections conducted by their mechanics or for downtime of airplanes caused by these inspections. The rule will require that these airplanes implement inspections and records reviews by FAA inspectors or Designated Airworthiness Representatives (DARs), at designated time intervals. This requirement will result in additional costs for the affected operators. These inspections/records review are expected to result in additional time that an airplane is out-of-service. While this downtime cost estimates in the NPRM were based on loss-of-service estimates that ranged from 0.7 to 1.6 days per airplane inspection, in these cost calculations, the downtime has been increased to 2.0 days. This increase in downtime reflects the input of public comments.

The estimated cost of airplane downtime is based on a rate of return to capital approach, in which the operational airplane is the productive capital and there is a return associated with its use. Consequently, out-of-service cost can be estimated through the loss of capital services of the aircraft. The value of this loss is

measured by the rate of return to capital (aircraft). This analysis uses 7 percent per annum as the average rate of return to capital; this rate is also preferred by the Office of Management and Budget for present-value calculations. Consequently, downtime costs were calculated as the product of the 2 downtime days, divided by 365 days (per year), multiplied by the rate-of-return to capital, at 7 percent. The resulting estimate is a downtime cost per airplane (in a model group), per inspection. To obtain the cost of downtime for a model group, the downtime cost per airplane is multiplied by the number of airplanes in that model group. The total downtime cost of the rule is the summation across model groups and over time. Thus, the estimate for downtime costs, for part 121 airplanes with damage-tolerance-based SSIPs over the period of analysis, is $98.4 million, undiscounted. Assuming an average of two inspections per airplane over the 20-year period of analysis, and using 7,620 airplanes and 2 days per inspection, one estimates downtime costs at $3,228 per day per airplane (undiscounted).

This figure (of $3,228 per day) is significantly different/lower than figures provided by some public comments of $80,000 in lost revenue per inspection which - given a two-day downtime period - would result in $40,000 lost revenue per day. On should note that the relevant variable to measure for downtime cost is lost net income - that is, "revenue minus costs" of operating the airplane. And lost net income would be substantially lower than lost revenue per day for an airplane. When an airplane is out-of-service, there is loss of revenue but costs of operation

are also not incurred (pilot salaries, fuel, maintenance, etc.).

There were also adjustments to these cost estimates. The estimated total cost of the rule, for this group of airplanes, was computed under the hypothesis that all of the affected airplanes that exist today will continue to be operating through the end of the study period - year 2020. In actuality, however, over time there will be normal replacement and retirement, by operators of these airplanes. Consequently, a substantial portion of these costs will not be incurred. The evaluation assumes that at least one-third of the potential $245.0 million costs will not be incurred due to normal replacement and retirement of aircraft. This assumption is the same as that used in the initial regulatory evaluation.

Cost of the Rule for Part 121 Airplanes that Need to Incorporate Damage-Tolerance-Based SSIPs into Their Maintenance Program

Steps in Cost Estimation:

The relevant tasks and associated costs of the rule for these airplanes include:

1) Development of the damage-tolerance-based SSIP.

2) Incorporation of damage-tolerance-based SSIPs into operators' maintenance programs.

3) Review/approval by FAA of operators' damage-tolerance-based SSIP and of their incorporation into the operators' maintenance programs.

4) Modification costs.

5) Inspections - conducted by airline mechanics.

6) Downtime costs for airplanes for inspections - by airline mechanics.

7) Cost for operator personnel to prepare the airplane and its records for the FAA inspector or DAR, to conduct their inspection and records review.

8) Direct costs for FAA inspectors/DARs, to conduct inspections and records reviews of the affected airplanes.

9) Downtime cost of airplane for the above inspection and records review by FAA/DARs.

With regard to the downtime costs of airplanes for inspections by mechanics, the evaluation assumes that each 40 hours of inspection work, caused by this rule, will require one additional day of airplane downtime. The methodology again uses the rate of return to capital approach, with 7 per cent per year. Consequently, the cost of aircraft downtime, for mechanic inspections, for the affected airplanes over the period of analysis is estimated at $3.1 million, undiscounted.

With regard to the downtime costs of these airplanes for inspection/records review by FAA/DARs, the additional downtime is estimated to range between 0.7 and 1.6 days per airplane inspection - depending on airplane value. Subsequently, the cost of downtime is calculated by the rate of return to capital approach (using 7 percent). The result is an estimate of $702,000 undiscounted, for downtime costs of the affected airplanes.

Adjustments to Cost Estimates

For some models, the potential cost of complying with the requirements of the rule could constitute a significant

proportion of (or may actually exceed) the economic values of the airplanes involved. Consequently, for each airplane model group, the estimated potential cost of compliance was compared with the estimated economic value of the airplanes in that model group. In cases where the potential compliance cost exceeds 50 percent of the group value, the methodology assumes that a SSIP will not be developed and implemented. Consequently, the related compliance costs for the rule will not be incurred. Instead, it is expected that the affected models will be retired or transferred out of scheduled service. The estimated forced out-of-service costs for these models are estimated to be 50 percent reduction in their economic value.

However, this (apparent) reduction in the cost of the rule is accompanied by an increase in another type of cost. This includes the hardship and economic dislocation that will result from the reduction in operations, or by possibly going out of business, by some operators. This hardship can include the loss of jobs by employees of the affected operators, and the subsequent negative effects of this on themselves (their households) and their communities. These costs are recognized although not quantified.

Other Adjustments to the Cost Estimates

The estimated cost of the rule for this group of airplanes was computed under the scenario whereby all of the affected airplanes that exist today will continue to fly through the end of the study period (year 2020). In actuality, however, there will be normal replacement and

retirement of these airplanes (by operators) and, consequently, a substantial portion of these costs will not be incurred. The replacement cycle for this group of airplanes can vary widely. For some mainstream scheduled commuter carriers, it is common practice for airplanes to be routinely replaced. In a number of cases, few if any of the costs of this rule will be incurred. Conversely, the economics of some smaller, or niche carriers, are such that airplanes may continue to fly for 40 years or more. Given available information, the evaluation assumes that at least one-third of the potential $163.8 million costs will not be incurred, as a result of normal replacement/retirement of airplanes - leaving an estimated cost of $104.4 million.

Part 135 Airplanes

This final rule exempts certain part 135 airplanes from implementing DT-based SSIPs. These are multi-engine airplanes, operated in scheduled service, initially certificated with 9 or fewer passengers. Instead of a DT SSIP, the operators of these airplanes will have to implement a service-history-based SSIP - by the year 2010. A service-history-based SSIP is estimated to cost significantly less than a damage-tolerance-based SSIP - in general, 0.20 of the cost of a DT-based SSIP. The cost of the rule for this group of airplanes is estimated at $1.7 million, discounted ($2.9 million, undiscounted).

Costs to the FAA

The rule is also estimated to have costs of $91.0 million undiscounted to the FAA. Virtually, the entire

amount of these costs is for FAA inspectors to conduct inspections and records review. This cost estimate is based on the assumption that 40 percent of the inspections/records review will be conducted by the FAA inspectors while 60 percent will be conducted by DARs.

Table 2 presents the total costs of the rule, over the period of analysis - for the operators (and manufacturers) of the affected airplanes and the FAA. Total costs are estimated at $362.9 million, undiscounted, with a present value of $173.5 million.

Table 2
TOTAL COST OF THE RULE ($Millions)
(2001-2020)

	Undiscounted Costs	Discounted Costs
Operators of airplanes that have damage-tolerance-based SSIPs	$ 164.1	$ 72.2
Operators of airplanes that need damage-tolerance-based SSIPs	$ 104.9	$ 59.6
Operators of airplanes that need service-history-based SSIPs	$ 2.9	$ 1.7
FAA costs	$ 91.0	$ 40.0
TOTAL COSTS	$ 362.9	$ 173.5

COMPARISON OF COSTS AND BENEFITS

The changes required by the rule are necessary to ensure the continuing airworthiness of aging airplanes. The FAA finds that the expected benefits of the rule justify its costs. The total estimated costs of the rule are $173.5 million, discounted ($362.9 million, undiscounted). The benefits have been assessed through several perspectives as explained below.

There is growing evidence of significant occurrence of fatigue cracks on airplanes and the potentially dire consequences of such cracks. The evidence of significant risk of airplane accidents, as a result of cracks, include: 1) the Aloha accident; 2) the results of the relative risk assessment; 3) the number of Service Difficult Reports on cracks; and 4) the Airworthiness Directives issued for fatigue and cracking on the U.S. commercial aviation fleet.

The relative risk assessment showed that while a small risk of failure - due to fatigue cracks - exists by year 14 of an airplane's service life, by age 22, that risk is 10 times greater (one order of magnitude). Furthermore, by age 35, the risk is 100 times greater than at age 14 (two orders of magnitude). Over 25 percent of the fleet has reached or exceeded the range of 22 to 25 years of age. Over 10 percent of the fleet has reached or exceeded 35 years of age.

In addition, a search resulted in 88,000 Service Difficulty Reports on cracks, since 1990. This number of records indicates a prevalent and significant problem with cracks in the aircraft fleet. Furthermore, the significant number of ADs on cracks on airplanes - issued during a

recent period (of less than a year) also indicates the existence of a serious problem with cracks on the U.S. commercial fleet. ADs are issued quickly to remedy problems that have a high likelihood of resulting in accidents. Each AD, by itself, is proof that a significant accident risk exists.

Therefore, based on the above evidence, the FAA finds that the expected benefits of this rule justify its expected costs.

REGULATORY FLEXIBILITY ANALYSIS

The Regulatory Flexibility Act of 1980 (RFA) establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals, and to consider the rationale for their actions. The Act covers a wide range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will have such an impact, the agency must prepare a regulatory flexibility analysis as described in the Act. However, if an agency determines

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

For the NPRM, the FAA conducted a complete initial regulatory flexibility analysis to assess the impact on small entities. This rule will affect commercial operators of airplanes, in the specified part of the CFR. For these operators, a small entity is defined as one with 1,500 or fewer employees. As there are operators that met that criteria for a small business, calculations were carried out to assess whether the rule will have a significant impact on a substantial number of these operators.

Issues Addressed in the Final Regulatory Flexibility Analysis (FRFA)

The central focus of the FRFA, like the Initial Regulatory Flexibility Analysis (IRFA), is the requirement that agencies evaluate the impact of a rule on small entities and analyze regulatory alternatives that minimize the impact when there will be a significant economic impact on a substantial number of small entities.

The requirements, outlined in section 604(a)(1-5), are listed and discussed below:

1) A succinct statement of the need for, and objectives of, the rule - This rule represents a critical step toward compliance with the Aging

Aircraft Safety Act of 1991. Section 44717 of Title 49 instructs the Administrator to "prescribe regulations that ensure the continuing airworthiness of aging aircraft." The law also requires the Administrator to make inspections, and review the maintenance and other records, of each aircraft an air carrier uses to provide air transportation. The objectives of the rule is to ensure the continuing airworthiness of aging airplanes operating in air transportation.

2) A summary of the significant issues raised by the public comments in response to the IRFA, a summary of the agency's assessment of such issues, and a statement of any changes made in the proposed rule as a result of such comments -- There were very few public comments explicitly on the Initial Regulatory Flexibility Analysis. There were a substantial number of comments from part 135 operators that complained about the financial burden that the proposed rule would place on them. Small commercial operators (less than 1500 employees) come from this group, as well as from part 121 operators.

In response to public comments, the FAA made several changes to the final rule:

(i) The primary change is that part 135 airplanes operating in scheduled operations, initially certificated with nine passenger seats or less, are exempted from implementing damage-tolerance-based SSIPs. Instead, they are to implement service-history-based SSIPs - and those by 2010. The SH SSIPs are estimated to cost 20 percent of the cost of a DT SSIP (to develop and implement).

(ii) The interval between repeat inspections was extended in the final rule to seven years, from five years in the NPRM.

(iii) For the initial inspection, the interval from the effective date of the rule was extended from 3 to 4 years for airplanes greater than 25 years old.

3) **A description of, and an estimate of, the number of small entities to which the rule will apply or an explanation of why no such estimate is available** -- The FAA estimated the number and input of small entities as follows. First, small operators in part 121 were selected, by using a database that listed part 121 operators, with their number of employees and annual revenue. This database came from a study on small business done for the FAA by a consulting firm (GRA, Incorporated). The search identified 58 operators with 1500 or fewer employees, and with known annual revenue. Then, airplanes of these operators were identified - by using data from the BACK database. This search identified small entities operating under part 121, with affected airplanes (those in part 121 that had DT SSIPs and those that need DT SSIPs).

Next, the net present value of the cost of the rule was calculated for each operator. As these cost calculations are based on airplane model groups, the resulting net present value (NPV) for one airplane is obtained by dividing the cost of the group by the total number of airplanes in that group. The result is an "average" net present value per airplane. The NPV per airplane is then multiplied by the number of airplanes of that operator, in that model group. If there is more than one model group, per operator, the NPVs of the model groups

are summed to derive the net present value of the cost of this rule for the affected operators. Subsequently, these discounted costs are used to derive annualized costs, for each affected small operator.

With respect to part 135 operators, a search was made in the GRA database that listed part 135 operators, along with the number of employees and annual revenues per firm. The identified small operators were then checked against a database of the FAA which listed the names of part 135 operators and their airplanes. This search identified 26 small entities operating under part 135, including two operators that operate under parts 135 and 121. For part 135 operators, the net present value of the rule's cost and annualized cost were derived in the same manner as for part 121 operators.

Annualized costs for the affected operators were then divided by annual revenues of the operators. The results show that for all - except two - of the listed 58 small operators, under part 121, the ratio of annualized cost to revenues is substantially less than one percent. For one operator, the ratio is 5.9 percent, while for another operator, it is 1.1 percent. With regard to part 135 operators, of the 24 identified operators, all but two show a ratio of annualized cost to annual revenue that is less than one percent. Thus, of the 82 identified small operators - under part 121 and/or part 135 - all except four have a ratio of annualized cost to annual revenue that is substantially less than one percent.

4) A description of the projected reporting, record-keeping, and other compliance requirements of the rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for

preparation of the report or record -- In order for the FAA to fulfill its obligation under 49 U.S.C. 44717, this rule will require that certain records be made available by the operator. Most of the records that will be required under this rule for part 121 airplanes are currently required by other regulations. Consequently, there is expected to be a minimal additional paperwork, for these airplanes, as a result of the rule. Concerning part 135 airplanes, their exemption from DT SIPPs is expected not to result in additional paperwork for their operators.

5) A description of the steps the agency has taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.

In order to decrease the cost burden for the final rule, the FAA will exempt operators of part 135 airplanes from implementing damage-tolerance-based (DT) SSIPs. These operators are nearly all small entities. Instead of the DT-based SSIP requirement, these operators' aircraft will be subject to a Service-History (SH)- based supplemental inspection program to be implemented by the year 2010. The SH-based SSIP is estimated to be 20 percent of the cost of a DT-based SSIP.

Furthermore, in its efforts to assist small entities and other affected parties operating part 135 airplanes, the FAA will publish (with the final rule) an advisory circular, AC 91-60A "The Continued Airworthiness of Older Airplanes".

Description of Alternatives

The FAA has considered several alternative approaches to

this rulemaking and has attempted to minimize the potential economic impact of the rule, especially the impact on the operation of aircraft most likely to be used by small entities. At the same time, the agency needs to meet its primary responsibility for aviation safety and its particular obligation under 49 U.S.C. 44717 to ensure the continuing airworthiness of aging aircraft.

The FAA made two changes to the requirements of the final rule that significantly lower compliance costs of operators. First, the FAA chose to lengthen the time period between inspections from 5 to 7 years. This longer period lowers the compliance cost of the affected operators as the inspections can occur at a heavy maintenance check. Second, the FAA exempted part 135 operators from the most expensive requirement of the rule. Part 135 operators are nearly all small entities.

Compliance Assistance

In its efforts to assist small entities and other affected parties in complying with the rule, the FAA will be publishing two advisory circulars (for comment) with the final rule. One is AC 91-56B "Continuing Structural Integrity Program for Airplanes" and it will provide guidance for complying with a DT SSIP. The other document is AC 91-60A "The Continued Airworthiness of Older Airplanes", which will provide guidance for complying with a service-history based SSIP. These circulars will be published concurrently with this rule, with a request for comments.

INTERNATIONAL TRADE IMPACT ANALYSIS

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and where appropriate, that they be the basis for U.S. standards.

In accordance with the above statute, the FAA has assessed the potential affect of this final rule and has determined that it will impose the same costs on domestic and international entities and thus will have a neutral trade impact.

UNFUNDED MANDATES ANALYSIS

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate, in a proposed or final agency rule, that may result in an expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is

any provision in a Federal agency regulation that will impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million in any one year.

Paperwork Reduction Act

Information collection requirements in the final rule have been previously approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) and have been assigned OMB Control Numbers: 2120-0020-, 2120-0008, and 2120-0039. Part 129 record requirements can be found in International Civil Aviation Organization Annexes.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO)

Standards and Recommended Practices to the maximum extent practicable. The FAA determined that there are no ICAO Standards and Recommended Practices that correspond to these regulations.

International Trade Impact Analysis

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. In addition, consistent with the Administration's belief in the general superiority and desirability of free trade, it is the policy of the Administration to remove or diminish, to the extent feasible, barriers to international trade. This includes both barriers affecting the export of American goods and services to foreign countries, and barriers affecting the import of foreign goods and services into the United States.

In accordance with the above statute and policy, the FAA has assessed the potential effect of this final rule and has determined that it will impose the same costs on domestic and international entities, and thus will have a neutral trade impact.

Unfunded Mandates Analysis

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Public Law 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate, in a proposed or final agency rule, that may result in an expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that will impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million in any one year.

Executive Order 13132, Federalism

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

Environmental Analysis

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

Energy Impact

The energy impact of the notice has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) Public Law 94-163, as amended (42 U.S.C. 6362), and FAA Order 1053.1. It has been determined that the

final rule is not a major regulatory action under the provisions of the EPCA.

List of Subjects

14 CFR Part 119

Air carriers, Air transportation, Aircraft, Aviation safety, Commuter operations, Reporting and recordkeeping requirements.

14 CFR Part 121

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

14 CFR Part 129

Air carriers, Aircraft, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 135

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 183

Aircraft, Authority delegations (Government agencies), Reporting and recordkeeping requirements.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends parts 119, 121, 129, 135, and 183 of Title 14, Code of Federal Regulations as follows:

PART 119-CERTIFICATION: AIR CARRIERS AND COMMERCIAL OPERATORS

1. The authority citation for part 119 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1153, 40101, 40102, 40103, 40113, 44105, 44106, 44111, 44701-44717, 44722, 44901, 44903, 44904, 44906, 44912, 44914, 44936, 44938, 46103, 46105.

2. Amend § 119.3 by adding the definition of "years in service" after the definition of "When common carriage is not involved or operations not involving common carriage" to read as follows:

§ 119.3 Definitions.

* * * * *

Years in service means the calendar time elapsed since an aircraft was issued its first U.S. or first foreign airworthiness certificate.

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

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

Authority: 49 U.S.C. 106(g), 40113, 40119, 44101, 44701-44702, 44705, 44709-44711, 44713, 44716-44717, 44722, 44901, 44903-44904, 44912, 46105.

4. Add § 121.368 to read as follows:

§ 121.368 Aging airplane inspections and records reviews.

(a) Applicability. This section applies to all airplanes operated by a certificate holder under this part,

except for those airplanes operated between any point within the State of Alaska and any other point within the State of Alaska.

(b) Operation after inspection and records review. After the dates specified in this paragraph, a certificate holder may not operate an airplane under this part unless the Administrator has notified the certificate holder that the Administrator has completed the aging airplane inspection and records review required by this section. During the inspection and records review, the certificate holder must demonstrate to the Administrator that the maintenance of age-sensitive parts and components of the airplane has been adequate and timely enough to ensure the highest degree of safety.

(1) Airplanes exceeding 24 years in service on [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has exceeded 24 years in service on [*insert effective date of the rule*], no later than [*insert date 4 years after the effective date of the rule*], and thereafter at intervals not to exceed 7 years.

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(2) Airplanes exceeding 14 years in service but not 24 years in service on [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has exceeded 14 years in service but not 24 years in service on [*insert effective date of the rule*], no

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later than [*insert date 5 years after the effective date of the rule*], and thereafter at intervals not to exceed 7 years.

(3) Airplanes not exceeding 14 years in service on DEC - 8 2003 [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has not exceeded 14 years in service on DEC - 8 2003 [*insert effective date of the rule*], no later than 5 years after the start of the airplane's 15th year in service and thereafter at intervals not to exceed 7 years.

(c) Unforeseen schedule conflict. In the event of an unforeseen scheduling conflict for a specific airplane, the Administrator may approve an extension of up to 90 days beyond an interval specified in paragraph (b) of this section.

(d) Airplane and records availability. The certificate holder must make available to the Administrator each airplane for which an inspection and records review is required under this section, in a condition for inspection specified by the Administrator, together with records containing the following information:

(1) Total years in service of the airplane;

(2) Total flight hours of the airframe;

(3) Total flight cycles of the airframe;

(4) Date of the last inspection and records review required by this section;

(5) Current status of life-limited parts of the airframe;

(6) Time since the last overhaul of all structural components required to be overhauled on a specific time basis;

(7) Current inspection status of the airplane, including the time since the last inspection required by the inspection program under which the airplane is maintained;

(8) Current status of the following, including the method of compliance:

(i) Airworthiness directives;

(ii) Corrosion Prevention and Control Programs; and

(iii) Inspections and procedures required by § 121.370a of this part;

(9) A list of major structural alterations; and

(10) A report of major structural repairs and the current inspection status for those repairs.

(e) Notification to Administrator. Each certificate holder must notify the Administrator at least 60 days before the date on which the airplane and airplane records will be made available for the inspection and records review.

5. Add § 121.370a to read as follows:

§ 121.370a Supplemental inspections.

(a) Applicability and general requirements. After DEC - 5 2007 [*insert date 4 years after the effective date of the rule*], a certificate holder may not operate an airplane under this part unless the maintenance program for that airplane

includes damage-tolerance-based inspections and procedures. Paragraphs (b), (c), and (d) of this section list the exceptions to this requirement. This section does not apply to an airplane operated by a certificate holder under this part between any point within the State of Alaska and any other point within the State of Alaska.

(b) New model added through type certificate amendment. This paragraph applies to each airplane added to a type certificate after [*insert effective date of the rule*], that has a certification basis that does not include a requirement for damage-tolerance-based inspections and procedures. A certificate holder may not operate that airplane more than 4 years after the date of the type certificate amendment unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures.

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(c) Design-life goal airplanes. If on or after [*insert date 4 years after the effective date of the rule*], the time in service of an airplane reaches the design-life goal listed in appendix N to this part, the certificate holder may operate that airplane until the date the airplane's time in service reaches the design-life goal or until December 20, 2010, whichever occurs sooner. After that date, the certificate holder may not operate the airplane unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures.

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(d) Airworthiness directive-mandated service-history-based inspections. Until December 20, 2010, a certificate holder may operate an airplane for which an airworthiness directive requires the maintenance program to include service-history-based inspections and procedures. After that date, the certificate holder may not operate the airplane unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures.

(e) Approvals. The inspections and procedures required by this section to be included in the certificate holder's maintenance program for an airplane must be approved by the FAA Aircraft Certification Office or office of the Small Airplane Directorate or Transport Airplane Directorate having cognizance over the type certificate for the affected airplane.

6. Add appendix N to part 121 to read as follows:

APPENDIX N TO PART 121 - DESIGN-LIFE GOALS

Airplane Type	Number of Seats	Type Certificate Data Sheet	Design-Life Goal (Hours)
Raytheon (Beech) Aircraft Co.			
-Beech 99 (all models)	15+2	A14CE	46,000
-Beech 1900 and 1900C	19+2	A24CE	45,000
-Beech 300 and 300LW	13+2	A24CE	30,000
-Beech B300 and B300C	15+2	A24CE	30,000
-Beech 1900D	19+2	A24CE	45,000
British Aerospace Ltd.			
-BAe Jetstream 3101	19+2	A21EU	45,000
-BAe Jetstream 3201	19+2	A56EU	30,000
deHavilland Aircraft Co.			
-DHC-6	22+2	A9EA	33,000

Airplane Type	Number of Seats	Type Certificate Data Sheet	Design-Life Goal (Hours)
Dornier Luftfahrt GmbH			
-Dornier 228-100 and -200	19+2	A16EU	42,800
-Dornier 228-101 and -201	19+2	A16EU	32,800
-Dornier 228-202	19+2	A16EU	29,600
-Dornier 228-212 (Except SN 155 & 191 and up)	19+2	A16EU	26,400
-Dornier 228-212 (SN 155 and 191 and up)	19+2	A16EU	42,800
Empresa Brasileira de Aeronautica (Embraer)			
Embraer EMB-110	19+2	A21SO	30,000
Fairchild Aircraft Corporation			
-SA226-TC	20+2	A8SW	35,000
-SA227-AT	14+2	A5SW	35,000
-SA227-TT	9+2	A5SW	35,000
-SA227-AC	20+2	A8SW	35,000
-SA227-PC	20+2	A8SW	35,000
-SA227-BC	20+2	A8SW	35,000
-SA227-CC	19+2	A18SW	35,000
-SA227-DC	19+2	A18SW	35,000
Pilatus Britten-Norman			
PBN BN-2 Mk III (all models)	16+2	A29EU	20,480
Short Brothers PLC			
-SD3-30	39+2	A41EU	57,600
-SD3-60	39+2	A41EU	28,800
-SD3-Sherpa	39+2	A41EU	40,000

PART 129— OPERATIONS: FOREIGN AIR CARRIERS AND FOREIGN OPERATORS OF U.S.-REGISTERED AIRCRAFT ENGAGED IN COMMON CARRIAGE

7. The authority citation for part 129 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40104-40105, 40113, 40119, 44701-44702, 44712, 44716-44717, 44722, 44901-44904, 44906.

8. Revise § 129.1 to read as follows:

§ 129.1 Applicability and definitions.

(a) Foreign air carrier operations in the United States. This part prescribes rules governing the operation within the United States of each foreign air carrier holding the following:

(1) A permit issued by the Civil Aeronautics Board or the U.S. Department of Transportation under 49 U.S.C. 41301 through 41306 (formerly section 402 of the Federal Aviation Act of 1958, as amended), or

(2) Other appropriate economic or exemption authority issued by the Civil Aeronautics Board or the U.S. Department of Transportation.

(b) Operations of U.S.-registered aircraft solely outside the United States. In addition to the operations specified under paragraph (a) of this section, §§ 129.14, 129.16, 129.20, 129.32, and 129.33 also apply to U.S.-registered aircraft operated solely outside the United States in common carriage by a foreign person or foreign air carrier.

(c) Definitions. For the purpose of this part-

(1) Foreign person means any person who is not a citizen of the United States and who operates a U.S.-registered aircraft in common carriage solely outside the United States.

(2) Years in service means the calendar time elapsed since an aircraft was issued its first U.S. or first foreign airworthiness certificate.

9. Add § 129.16 to read as follows:

§ 129.16 Supplemental inspections for U.S.-registered aircraft.

(a) Multiengine airplanes with 10 or more passenger seats. After [*insert date 4 years after the effective date of this rule*], a foreign air carrier or foreign person may not operate a U.S.-registered multiengine airplane initially type certificated with 10 or more passenger seats under this part unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures. Paragraphs (c), (d), and (e) of this section list the exceptions to this requirement.

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(b) Multiengine airplanes with nine or fewer passenger seats. After December 20, 2010, a foreign air carrier or foreign person may not operate a U.S.-registered multiengine airplane initially type certificated with nine or fewer passenger seats under this part unless the inspection program for that airplane includes service-history-based inspections and procedures. Paragraphs (d) and (e) of this section list the exceptions to this requirement.

(c) New model added through type certificate amendment. This paragraph applies to each U.S.-registered multiengine airplane initially type certificated with 10 or more passenger seats that is added to a type

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certificate after [*insert effective date of the rule*], that has a certification basis that does not include a requirement for damage-tolerance-based inspections and procedures. A foreign air carrier or foreign person may not operate that airplane more than 4 years after the date of the type certificate amendment unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures.

(d) Design-life goal airplanes. If on or after
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[*insert date 4 years after the effective date of the rule*], the time in service of the airplane reaches the design-life goal listed in appendix B to this part, the foreign air carrier or foreign person may operate the airplane until the airplane's time in service reaches the design-life goal or until December 20, 2010, whichever occurs sooner. After that date, the foreign air carrier or foreign person may not operate the airplane unless it complies with paragraph (a) or paragraph (b) of this section.

(e) Airworthiness directive-mandated service-history-based inspections. Until December 20, 2010, a foreign air carrier or foreign person may operate a U.S.-registered multiengine airplane initially type certificated with 10 or more passenger seats and for which an airworthiness directive requires the maintenance program to include service-history-based inspections and procedures. After that date, the foreign air carrier or foreign person may not operate the airplane unless the maintenance program for that

airplane includes damage-tolerance-based inspections and procedures.

(f) Approvals. The inspections and procedures required by this section to be included in the certificate holder's maintenance program for an airplane must be approved by the FAA Aircraft Certification Office or office of the Small Aircraft Directorate or Transport Airplane Directorate having cognizance over the type certificate for the affected airplane.

10. Add § 129.33 to read as follows:

§ 129.33 Aging airplane inspections and records reviews for U.S.-registered multiengine aircraft.

(a) Operation after inspection and records review. After the dates specified in this paragraph, a foreign air carrier or foreign person may not operate a U.S.-registered multiengine airplane under this part unless the Administrator has notified the foreign air carrier or foreign person that the Administrator has completed the aging airplane inspection and records review required by this section. During the inspection and records review, the foreign air carrier or foreign person must demonstrate to the Administrator that the maintenance of agesensitive parts and components of the airplane has been adequate and timely enough to ensure the highest degree of safety.

(1) Airplanes exceeding 24 years in service on *[insert effective date of the rule]*; initial and repetitive inspections and records reviews. For an airplane that has

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exceeded 24 years in service on [*insert effective date of the rule*], no later than [*insert date 4 years after the effective date of the rule*], and thereafter at intervals not to exceed 7 years.

(2) Airplanes exceeding 14 years in service but not 24 years in service on [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has exceeded 14 years in service, but not 24 years in service, on [*insert effective date of the rule*], no later than [*insert date 5 years after the effective date of the rule*], and thereafter at intervals not to exceed 7 years.

(3) Airplanes not exceeding 14 years in service on [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has not exceeded 14 years in service on [*insert effective date of the rule*], no later than 5 years after the start of the airplane's 15th year in service and thereafter at intervals not to exceed 7 years.

(b) Unforeseen schedule conflict. In the event of an unforeseen scheduling conflict for a specific airplane, the Administrator may approve an extension of up to 90 days beyond an interval specified in paragraph (b) of this section.

(c) Airplane and records availability. The foreign air carrier or foreign person must make available to the Administrator each U.S.-registered multiengine airplane for which an inspection and records review is required under this section, in a condition for inspection specified by the Administrator, together with the records containing the following information:

(1) Total years in service of the airplane;

(2) Total flight hours of the airframe;

(3) Total flight cycles of the airframe;

(4) Date of the last inspection and records review required by this section;

(5) Current status of life-limited parts of the airframe;

(6) Time since the last overhaul of all structural components required to be overhauled on a specific time basis;

(7) Current inspection status of the airplane, including the time since the last inspection required by the inspection program under which the airplane is maintained;

(8) Current status of the following, including the method of compliance:

(i) Airworthiness directives;

(ii) Corrosion Prevention and Control Programs; and

(iii) Inspections and procedures required by § 129.16 of this part;

(9) A list of major structural alterations; and

(10) A report of major structural repairs and the current inspection status for those repairs.

(d) Notification to Administrator. Each foreign air carrier or foreign person must notify the Administrator at least 60 days before the date on which the airplane and airplane records will be made available for the inspection and records review.

11. Add appendix B to part 129 to read as follows:

APPENDIX B TO PART 129 - DESIGN-LIFE GOALS

Airplane Type	Number of Seats	Type Certificate Data Sheet	Design-Life Goal (Hours)
Raytheon (Beech) Aircraft Co.			
-Beech 99 (all models)	15+2	A14CE	46,000
-Beech 1900 and 1900C	19+2	A24CE	45,000
-Beech 300 and 300LW	13+2	A24CE	30,000
-Beech B300 and B300C	15+2	A24CE	30,000
-Beech 1900D	19+2	A24CE	45,000
British Aerospace Ltd.			
-BAe Jetstream 3101	19+2	A21EU	45,000
-BAe Jetstream 3201	19+2	A56EU	30,000
Cessna Aircraft Co.			
-Cessna 402 Series (all models except 402C)	8+2	A7CE	12,000
-Cessna 402C	8+2	A7CE	7,700
deHavilland Aircraft Co.			
-DHC-6	22+2	A9EA	33,000
Dornier-Luftfahrt GmbH			
-Dornier 228-100 and -200	19+2	A16EU	42,800
-Dornier 228-101 and -201	19+2	A16EU	32,800
-Dornier 228-202	19+2	A16EU	29,600
-Dornier 228-212 (Except SN 155 & 191 and up)	19+2	A16EU	26,400
-Dornier 228-212 (SN 155 and 191 and up)	19+2	A16EU	42,800

Airplane Type	Number of Seats	Type Certificate Data Sheet	Design-Life Goal (Hours)
Empresa Brasileira de Aeronautica (Embraer)			
Embraer EMB-110	19+2	A21SO	30,000
Fairchild Aircraft Corporation			
-SA226-TC	20+2	A8SW	35,000
-SA227-AT	14+2	A5SW	35,000
-SA227-TT	9+2	A5SW	35,000
-SA227-AC	20+2	A8SW	35,000
-SA227-PC	20+2	A8SW	35,000
-SA227-BC	20+2	A8SW	35,000
-SA227-CC	19+2	A18SW	35,000
-SA227-DC	19+2	A18SW	35,000
Pilatus Britten-Norman			
PBN BN-2 Mk III (all models)	16+2	A29EU	20,480
Piper Aircraft Inc., The New			
-PA 31 Navajo	6+2	A20SO	11,000
-PA 31-300 Navajo	6+2	A20SO	15,500
-PA 31P Pressurized Navajo	6+2	A8EA	14,000
-PA 31T Cheyenne and Cheyenne II	7+2	A8EA	12,000
-PA 31-350 Chieftain and (T-1020)	9+2	A20SO	13,000
-PA 31-325 Navajo CR	9+2	A20SO	11,000
-PA 31T2 Cheyenne II XL	5+2	A8EA	11,400
-PA 31T3 (T-1040) without tip tanks	9+2	A8EA	17,400
-PA 31T3 (T-1040) with tip tanks	9+2	A8EA	13,800
Short Brothers PLC			
-SD3-30	39+2	A41EU	57,600
-SD3-60	39+2	A41EU	28,800
-SD3-Sherpa	39+2	A41EU	40,000

PART 135-OPERATING REQUIREMENTS: COMMUTER AND ON-DEMAND OPERATIONS AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

12. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701-44702, 44705, 44709, 44711-44713, 44715-44717, 44722.

13. Add § 135.168 to read as follows:

§ 135.168 Supplemental inspections.

(a) Applicability. This section applies to each multiengine airplane operated by a certificate holder in scheduled operations under this part, except for those operations conducted between any point within the State of Alaska and any other point within the State of Alaska.

(b) Multiengine airplanes with 10 or more passenger seats. After [*insert date 4 years after the effective date of this rule*], a certificate holder may not operate, in scheduled operations under this part, a multiengine airplane initially type certificated with 10 or more passenger seats unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures. Paragraphs (d), (e), and (f) of this section list the exceptions to this requirement.

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(c) Multiengine airplanes with nine or fewer passenger seats. After December 20, 2010, a certificate holder may not operate, in scheduled operations under this part, a

multiengine airplane initially type certificated with nine or fewer passenger seats unless the inspection program for that airplane includes service-history-based inspections and procedures. Paragraph (e) of this section lists the exception to this requirement.

(d) New model added through type certificate amendment. This paragraph applies to each U.S.-registered multiengine airplane initially type certificated with 10 or more passenger seats added to a type certificate after DEC - 8 2003 [*insert effective date of the rule*], that has a certification basis that does not include a requirement for damage-tolerance-based inspections and procedures. A certificate holder may not operate that airplane, in scheduled operations, more than 4 years after the date of the type certificate amendment unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures.

(e) Design-life goal airplanes. If on or after DEC - 5 2007 [*insert date 4 years after the effective date of the rule*], the time in service of the airplane reaches the design-life goal listed in appendix G to this part the certificate holder may operate that airplane in scheduled operations until the date the airplane's time in service reaches the design-life goal or until December 20, 2010, whichever occurs sooner. After that date, the certificate holder may not operate the airplane in scheduled operations unless it

complies with paragraph (b) or paragraph (c) of this section.

(f) Airworthiness directive-mandated service-history-based inspections. Until December 20, 2010, a certificate holder may operate an airplane for which an airworthiness directive requires the maintenance program to include service-history-based inspections and procedures. After that date, the certificate holder may not operate the airplane unless the maintenance program for that airplane includes damage-tolerance-based inspections and procedures.

(g) Approvals. The inspections and procedures required by this section to be included in the certificate holder's maintenance program for an airplane must be approved by the FAA Aircraft Certification Office or office of the Small Aircraft Directorate or Transport Airplane Directorate having cognizance over the type certificate for the affected airplane.

14. Add § 135.422 to read as follows:

§ 135.422 Aging airplane inspections and records reviews for multiengine airplanes certificated with 10 or more passenger seats.

(a) Applicability. This section applies to multiengine airplanes with 10 or more passenger seats operated by a certificate holder in scheduled operations under this part, except for those airplanes operated by a certificate holder between any point within the State of Alaska and any other point within the State of Alaska.

(b) Operation after inspections and records review. After the dates specified in this paragraph, a certificate holder may not operate a multiengine airplane in scheduled operations under this part unless the Administrator has notified the certificate holder that the Administrator has completed the aging airplane inspection and records review required by this section. During the inspection and records review, the certificate holder must demonstrate to the Administrator that the maintenance of age-sensitive parts and components of the airplane has been adequate and timely enough to ensure the highest degree of safety.

(1) Airplanes exceeding 24 years in service on [*insert* DEC - 8 2003 *effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has exceeded 24 years in service on [*insert* DEC - 8 2003 *effective date of the rule*], no later than [*insert* DEC - 5 2007 *date 4 years after the effective date of the rule*], and thereafter at intervals not to exceed 7 years.

(2) Airplanes exceeding 14 years in service but not 24 years in service on [*insert* DEC - 8 2003 *effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has exceeded 14 years in service, but not 24 years in service, on [*insert* DEC - 8 2003 *effective date of the rule*], no later than [*insert* DEC 4 2008 *date 5 years after the effective date*

of the rule], and thereafter at intervals not to exceed 7 years.

(3) Airplanes not exceeding 14 years in service on [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has not exceeded 14 years in service on [*insert effective date of the rule*], no later than 5 years after the start of the airplane's 15th year in service and thereafter at intervals not to exceed 7 years.

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(c) Unforeseen schedule conflict. In the event of an unforeseen scheduling conflict for a specific airplane, the Administrator may approve an extension of up to 90 days beyond an interval specified in paragraph (c) of this section.

(d) Airplane and records availability. The certificate holder must make available to the Administrator each airplane for which a inspection and records review is required under this section, in a condition for inspection specified by the Administrator, together with the records containing the following information:

(1) Total years in service of the airplane;

(2) Total flight hours of the airframe;

(3) Total flight cycles of the airframe;

(4) Date of the last inspection and records review required by this section;

(5) Current status of life-limited parts of the airframe;

(6) Time since the last overhaul of all structural components required to be overhauled on a specific time basis;

(7) Current inspection status of the airplane, including the time since the last inspection required by the inspection program under which the airplane is maintained;

(8) Current status of the following, including the method of compliance:

(i) Airworthiness directives;

(ii) Corrosion Prevention and Control Programs; and

(iii) Inspections and procedures required by § 135.168 of this part;

(9) A list of major structural alterations; and

(10) A report of major structural repairs and the current inspection status for those repairs.

(e) Notification to Administrator. Each certificate holder must notify the Administrator at least 60 days before the date on which the airplane and airplane records will be made available for the inspection and records review.

16 ~~15~~. Add new § 135.423 ~~a~~ to read as follows:

§ 135.423 ~~a~~ Aging airplane inspections and records reviews for multiengine airplanes certificated with nine or fewer passenger seats.

BF 11/27/02

(a) Applicability. This section applies to multiengine airplanes certificated with nine or fewer passenger seats operated by a certificate holder in

15. Redesignate existing §135.423 as § 135.424.

scheduled operations under this part, except for those airplanes operated by a certificate holder between any point within the State of Alaska and any other point within the State of Alaska.

(b) Operation after inspections and records review. After the dates specified in this paragraph, a certificate holder may not operate a multiengine airplane in scheduled operations under this part unless the Administrator has notified the certificate holder that the Administrator has completed the aging airplane inspection and records review required by this section. During the inspection and records review, the certificate holder must demonstrate to the Administrator that the maintenance of age-sensitive parts and components of the airplane has been adequate and timely enough to ensure the highest degree of safety.

(1) Airplanes exceeding 24 years of service in service on [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has exceeded 24 years in service on [*insert effective date of the rule*], no later than [*insert date 4 years after the effective date of the rule*], and thereafter at intervals not to exceed 7 years.

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(2) Airplanes not exceeding 14 years in service but not 24 years in service on [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has exceeded 14 years in

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service, but not 24 years in service, on [*insert effective date of the rule*], no later than [*insert date 5 years after the effective date of the rule*], and thereafter at intervals not to exceed 7 years.

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(3) Airplanes not exceeding 14 years in service on [*insert effective date of the rule*]; initial and repetitive inspections and records reviews. For an airplane that has not exceeded 14 years in service on [*insert effective date of the rule*], no later than 5 years after the start of the airplane's 15th year in service and thereafter at intervals not to exceed 7 years.

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DEC - 8 2003

(c) Unforeseen schedule conflict. In the event of an unforeseen scheduling conflict for a specific airplane, the Administrator may approve an extension of up to 90 days beyond an interval specified in paragraph (c) of this section.

(d) Airplane and records availability. The certificate holder must make available to the Administrator each airplane for which a inspection and records review is required under this section, in a condition for inspection specified by the Administrator, together with the records containing the following information:

(1) Total years in service of the airplane;

(2) Total flight hours of the airframe;

(3) Date of the last inspection and records review required by this section;

(4) Current status of life-limited parts of the airframe;

(5) Time since the last overhaul of all structural components required to be overhauled on a specific time basis;

(6) Current inspection status of the airplane, including the time since the last inspection required by the inspection program under which the airplane is maintained;

(7) Current status of the following, including the method of compliance:

(i) Airworthiness directives;

(ii) Corrosion Prevention and Control Programs; and

(iii) Inspections and procedures required by § 135.168 of this part;

(8) A list of major structural alterations; and

(9) A report of major structural repairs and the current inspection status for these repairs.

(e) Notification to Administrator. Each certificate holder must notify the Administrator at least 60 days before the date on which the airplane and airplane records will be made available for the inspection and records review.

17 ~~16.~~ Add appendix G to part 135 to read as follows:

BF 11/27/02

APPENDIX G TO PART 135 - DESIGN-LIFE GOALS

Airplane Type	Number of Seats	Type Certificate Data Sheet	Design-Life Goal (Hours)
Raytheon (Beech) Aircraft Co.			
-Beech 99 (all models)	15+2	A14CE	46,000
-Beech 1900 and 1900C	19+2	A24CE	45,000
-Beech 300 and 300LW	13+2	A24CE	30,000
-Beech B300 and B300C	15+2	A24CE	30,000
-Beech 1900D	19+2	A24CE	45,000
British Aerospace Ltd.			
-BAe Jetstream 3101	19+2	A21EU	45,000
-BAe Jetstream 3201	19+2	A56EU	30,000
Cessna Aircraft Co.			
-Cessna 402 Series (all models except 402C)	8+2	A7CE	12,000
-Cessna 402C	8+2	A7CE	7,700
deHavilland Aircraft Co.			
-DHC-6	22+2	A9EA	33,000
Dornier-Luftfahrt GmbH			
-Dornier 228-100 and -200	19+2	A16EU	42,800
-Dornier 228-101 and -201	19+2	A16EU	32,800
-Dornier 228-202	19+2	A16EU	29,600
-Dornier 228-212 (Except SN 155 & 191 and up)	19+2	A16EU	26,400
-Dornier 228-212 (SN 155 and 191 and up)	19+2	A16EU	42,800
Empresa Brasileira de Aeronautica (Embraer)			
Embraer EMB-110	19+2	A21SO	30,000
Fairchild Aircraft Corporation			
-SA226-TC	20+2	A8SW	35,000
-SA227-AT	14+2	A5SW	35,000
-SA227-TT	9+2	A5SW	35,000
-SA227-AC	20+2	A8SW	35,000
-SA227-PC	20+2	A8SW	35,000
-SA227-BC	20+2	A8SW	35,000
-SA227-CC	19+2	A18SW	35,000
-SA227-DC	19+2	A18SW	35,000

Airplane Type	Number of Seats	Type Certificate Data Sheet	Design-Life Goal (Hours)
Pilatus Britten-Norman			
PBN BN-2 Mk III (all models)	16+2	A29EU	20,480
Piper Aircraft Inc., The New			
-PA 31 Navajo	6+2	A20SO	11,000
-PA 31-300 Navajo	6+2	A20SO	15,500
-PA 31P Pressurized Navajo	6+2	A8EA	14,000
-PA 31T Cheyenne and Cheyenne II	7+2	A8EA	12,000
-PA 31-350 Chieftain and (T-1020)	9+2	A20SO	13,000
-PA 31-325 Navajo CR	9+2	A20SO	11,000
-PA 31T2 Cheyenne II XL	5+2	A8EA	11,400
-PA 31T3 (T-1040) without tip tanks	9+2	A8EA	17,400
-PA 31T3 (T-1040) with tip tanks	9+2	A8EA	13,800
Short Brothers PLC			
-SD3-30	39+2	A41EU	57,600
-SD3-60	39+2	A41EU	28,800
-SD3-Sherpa	39+2	A41EU	40,000

PART 183– REPRESENTATIVES OF THE ADMINISTRATOR

18 ~~17~~. The authority citation for part 183 continues to read as follows:

Authority: 31 U.S.C. 9701; 49 U.S.C. 106(g), 40113, 44702, 45303.

BF 11/27/02

19 ~~18~~. Amend § 183.33 by revising paragraph (a) to read as follows:

§ 183.33 Designated Airworthiness Representative.

* * * * *

(a) Perform examination, inspection, and testing services necessary to issue, and to determine the continuing effectiveness of, certificates, including issuing certificates, as authorized by the Director of Flight Standards Service in the area of maintenance or as authorized by the Director of Aircraft Certification Service in the areas of manufacturing and engineering.

* * * * *

Issued in Washington, DC, on November 1, 2002.

Marion C. Blakey
Administrator

Certified to be a True Copy
Bonnie Fritts
Bonnie Fritts