

**DEPARTMENT OF TRANSPORTATION****Federal Aviation Administration****14 CFR Parts 25, 121, and 129**

[Docket No. FAA-2006-24281; Notice No. 06-04]

RIN 2120-AIO5

**Aging Aircraft Program: Widespread Fatigue Damage****AGENCY:** Federal Aviation Administration (FAA), DOT.**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** This action is intended to prevent widespread fatigue damage by proposing to require that design approval holders establish operational limits on transport category airplanes. Design approval holders would also be required to determine if maintenance actions are needed to prevent widespread fatigue damage before an airplane reaches its operational limit. Operators of any affected airplane would be required to incorporate the operational limit and any necessary service information into their maintenance programs. Operation of an affected airplane beyond the operational limit would be prohibited, unless an operator has incorporated an extended operational limit and any necessary service information into its maintenance program.

**DATES:** Send your comments on or before July 17, 2006.

**ADDRESSES:** You may send comments [identified by Docket Number FAA-2006-24281] using any of the following methods:

- DOT Docket Web site: Go to <http://dms.dot.gov> and follow the instructions for sending your comments electronically.

- Government-wide rulemaking Web site: Go to <http://www.regulations.gov> and follow the instructions for sending your comments electronically.

- Mail: Docket Management Facility; U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, Room PL-401, Washington, DC 20590-0001. Due to the suspension of paper mail delivery to DOT headquarters facilities, we encourage commenters to send their comments electronically.

- Fax: 1-202-493-2251.

- Hand Delivery: Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For more information on the rulemaking process, see the

**SUPPLEMENTARY INFORMATION** section of this document.

Privacy: We will post all comments we receive, without change, to <http://dms.dot.gov>, including any personal information you provide. For more information, see the Privacy Act discussion in the **SUPPLEMENTARY INFORMATION** section of this document.

Docket: To read background documents or comments received, go to <http://dms.dot.gov> at any time or to Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Walter Sippel, FAA, Transport Airplane Airframe/Cabin Safety Branch, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, WA 98039-4056; telephone (425) 227-2774, fax (425) 227-1232.

**SUPPLEMENTARY INFORMATION:****Comments Invited**

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. We also invite comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. We ask that you send us two copies of written comments.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking. The docket is available for public inspection before and after the comment closing date. If you wish to review the docket in person, go to the address in the **ADDRESSES** section of this preamble between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. You may also review the docket using the Internet at the web address in the **ADDRESSES** section.

Privacy Act: Using the search function of our docket Web site, anyone can find and read the comments received into any of our dockets, including the name of the individual sending the comment (or signing the comment on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (65 FR 19477-78) or you may visit <http://dms.dot.gov>.

Before acting on this proposal, we will consider all comments we receive

on or before the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change this proposal in light of the comments we receive.

If you want the FAA to acknowledge receipt of your comments on this proposal, include with your comments a preaddressed, stamped postcard on which the docket number appears. We will stamp the date on the postcard and mail it to you.

**Availability of Rulemaking Documents**

You can get an electronic copy using the Internet by:

(1) Searching the Department of Transportation's electronic Docket Management System (DMS) Web page (<http://dms.dot.gov/search>).

(2) Visiting the Office of Rulemaking's Web page at <http://www.faa.gov/avr/arm/nprm.cfm?nav=nprm>; or

(3) Accessing the Government Printing Office's Web page at [http://www.access.gpo.gov/su\\_docs/aces/aces140.html](http://www.access.gpo.gov/su_docs/aces/aces140.html).

You can also get a copy by sending 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 docket number, notice number, or amendment number of this rulemaking.

**I. Executive Summary**

The rule proposed today would establish operational limits for transport category airplanes to preclude widespread fatigue damage (WFD). It would also require actions to prevent WFD in repairs, alterations, and modifications<sup>1</sup> to these airplanes. This proposal should preclude WFD from occurring in transport category airplanes by providing a more proactive management of WFD.

This proposal would require type certificate (TC) holders to establish an initial operational limit on certain airplanes. Operation of these airplanes beyond the initial operational limit would be prohibited, unless operators have incorporated an extended operational limit into their maintenance programs. Type certificate holders would be required to develop the initial

<sup>1</sup> Throughout this proposal, reference is made to "alterations" and "modifications." We consider these terms to be synonymous. An "alteration" is a design change that is made to an airplane; however, various segments of industry have also defined these changes as "modifications." Therefore, we use both terms in the proposed rule to be all inclusive of any design change and to avoid potential misinterpretation of the intent of these terms.

operational limits based on an evaluation of WFD susceptibility, both for existing airplanes and for proposed future certifications. For future type certification, all TC applicants for transport category airplanes would be affected. For existing type certificates, this proposal would affect only airplanes with maximum takeoff gross weights (MTGW) over 75,000 pounds, including airplanes that have had the MTGW increased to greater than 75,000 pounds. (These airplanes are referred to in this document as large transport category airplanes.) Supplemental type certificate (STC) holders for these airplanes would be required to evaluate their STCs for WFD and the ability of the airplane to remain free of WFD up to the initial operational limit established by the TC holder.

Once the proposed initial operational limits are developed, then operational rules in parts 121 and 129 would require operators to incorporate initial operational limits into their maintenance programs. The proposed operational rules would prohibit operation beyond the limit established for an airplane. However, the proposed design approval holder and operational rules would provide means for any person to extend the initial operational limit and for operators to operate an airplane under the extended operational limit. If an extended operational limit is incorporated, the proposed operational rules would prohibit operation beyond the extended operational limit established for an airplane. In addition, the proposed operational rules would address repairs, alterations, and modifications to airplanes operating with an extended operational limit.

The present value benefits of this proposal consist of \$726 million of accident prevention benefits and \$83 million of detection benefits for total benefits of \$809 million. The detection benefits are the benefits resulting from averted accidents and a reduction in unscheduled maintenance and repairs. The present value cost of this proposal, estimated over 20 years, is \$360 million. The FAA estimates that airplane manufacturers would incur approximately 10 percent of these costs, while the remaining 90 percent of these costs would be borne by operators.

**II. Background**

*A. Widespread Fatigue Damage*

WFD is the simultaneous presence of cracks at multiple structural locations that are of sufficient size and density such that the structure will no longer meet the residual strength requirements of section 25.571(b). Fatigue damage is

the gradual deterioration of a material subjected to repeated loads. Airplane structure experiences fatigue damage because it is subjected to repeated loads, such as the pressurization and depressurization of an airplane that occurs with each flight. The fatigue damage could result in cracks occurring in structure over time.

The likelihood of WFD in airplane structure increases with use. WFD results from many cracks that are generally too small to be reliably detected using existing inspection methods. These cracks could grow together very rapidly, so that failure could occur before another inspection is performed to detect them. The simultaneous presence of fatigue cracks that may grow together, with or without other damage in the same structural element, such as a large skin panel, is known as multiple site damage. The simultaneous presence of fatigue cracks in similar adjacent structural elements, such as frames and stringers, is known as multiple element damage. Some structural elements can be susceptible to both types of damage, which potentially could occur at the same time. If undetected, either type of damage could lead to catastrophic failure due to reduction of the strength capability of the structure.

The FAA, the European Joint Aviation Authorities, and representatives of the Airworthiness Assurance Working Group, working under the support of the Aviation Rulemaking Advisory Committee (ARAC), reviewed available service difficulty reports for the transport airplane fleet. They also evaluated the certification and design practices applied to these previously certificated airplanes, including fatigue test results. The review revealed that all airplanes in the fleet are susceptible to multiple site damage or multiple element damage. Table 1 identifies examples of structures susceptible to multiple site damage (MSD) and multiple element damage (MED).

**TABLE 1.—EXAMPLES OF STRUCTURES SUSCEPTIBLE TO WIDESPREAD FATIGUE DAMAGE**

Structure	Susceptible to
Longitudinal skin joints, frames and tear straps.	MSD/MED
Circumferential joints and stringers.	MSD/MED
Fuselage frames .....	MED
Lap joints with milled, chem.-milled, or bonded radius.	MSD
Stringer-to-frame attachments	MED
Shear clip end fasteners on shear tied fuselage.	MSD/MED

**TABLE 1.—EXAMPLES OF STRUCTURES SUSCEPTIBLE TO WIDESPREAD FATIGUE DAMAGE—Continued**

Structure	Susceptible to
Aft pressure dome outer ring and dome web splices.	MSD/MED
Skin splice at aft pressure bulkhead.	MSD
Abrupt changes in web or skin thickness (pressurized or unpressurized structure).	MSD/MED
Window surround structure ....	MSD/MED
Overwing fuselage attachments.	MED
Latches and hinges of nonplug doors.	MSD/MED
Skin at runoff of large doubler (MSD), fuselage, wing, or empennage.	MSD
Rib to skin attachments .....	MSD/MED
Typical wing or empennage structure.	MSD/MED
Wing and empennage chord-wise splices.	MSD/MED

*B. History of WFD in Transport Category Airplanes*

In April 1988, an 18-foot section of the upper fuselage of an Aloha Airlines Boeing Model 737 airplane separated from the airplane en route from Hilo to Honolulu, Hawaii. The National Transportation Safety Board determined that, among other things, WFD was a contributing cause of this accident. Since then, WFD appears to have played a role in several safety incidents involving large transport airplanes, although there has not been a catastrophic accident directly attributable to WFD. In particular, the FAA has issued or is in the process of issuing Airworthiness Directives (ADs) addressing aft pressure bulkhead cracks, lap splice cracks, and frame cracks.

*C. Industry Input/Aviation Rulemaking Advisory Committee*

The FAA has tasked the ARAC to address several issues related to widespread fatigue damage. In 2001, the ARAC recommended imposing a limit on the validity of maintenance programs, requiring an evaluation of repairs, alterations and modifications, and providing a means of extending the limit of validity of the maintenance program for large transport category airplanes. The ARAC also recommended that elements of the existing aging airplane program be included or referenced in the Airworthiness Limitations section (ALS) of the Instructions for Continued Airworthiness (ICA). In 2003, the ARAC recommended imposing a limit on the validity of maintenance programs for all

newly certificated transport category airplanes.

The ARAC recognized that structural fatigue characteristics of airplanes are only understood up to a point in time consistent with the analyses performed and the amount of testing accomplished. The maintenance program inspections related to structural fatigue are based on the results of these analyses and tests. Therefore, these inspections may need to be supplemented by further inspections, modifications, or replacements, if operation beyond a certain point is planned. The ARAC recommended that there should be a "limit of validity of the maintenance program" to limit the operation of an airplane. Once an airplane reached this limit, the operator should no longer operate the airplane, unless the operator has incorporated an extended limit of validity and any necessary service information into its maintenance program.

#### *D. Current Regulations and Programs Related to WFD*

##### 1. Existing Design Criteria

In the design process, a type certificate applicant generally establishes an expected economic life for the airplane, known as a design service goal. Applicants traditionally defined the design service goal early in the development of a new airplane, based on economic analyses, past service experience with prior models, and in some cases fatigue testing. Design approval holders have also performed additional fatigue tests, teardown inspections, and analyses to support changing design service goals to extended service goals. The regulations required applicants and design approval holders only to show that individual fatigue cracks would not lead to catastrophic structural failure. Since 1978, 14 CFR 25.571 has required applicants for new type certificates for transport category airplanes to establish inspections to detect fatigue cracks before they can grow to the point of catastrophic failure (43 FR 46242, October 5, 1978). These inspections are documented in the ALS.

In 1998, the FAA amended the aircraft certification requirements for transport category airplanes (63 FR 15707, March 31, 1998). As part of the certification process, section 25.571 now requires full-scale fatigue test evidence to demonstrate that WFD will not occur before an airplane reaches its design service goal. Only a few airplane models are subject to this new requirement, because the applications for most type certificates predate 1998. Even with the

requirement to perform full-scale fatigue testing, there is no requirement to limit the operation of an airplane once it reaches the design service goal.

##### 2. Instructions for Continued Airworthiness

As part of the current certification process, TC holders and STC holders who applied for a certificate after January 28, 1981 are required by § 21.50 to make available at least one set of complete ICA to the owner of the airplane. The ICA must include inspection and replacement instructions for airplane structure. Also, any person who makes a design change to airplane structure must provide the airplane owner with a complete set of the ICA for that change.

In developing the ICA, the applicant is required to include certain information, such as a description of the airplane and its systems, servicing information, and maintenance instructions (§ 25.1529). The applicant must include the frequency and extent of the structural inspections necessary to provide for the continued airworthiness of the airplane as well as an FAA-approved ALS listing all mandatory inspections, inspection intervals, replacement times, and related procedures. The FAA requires operators to comply with each ALS established under § 25.1529 for newly certified airplanes or with operation specifications approved under part 121 or 135. Operators may also incorporate tasks—from a Maintenance Review Board document that has been approved by the FAA<sup>2</sup>—into their maintenance program.

##### 3. Airworthiness Directives

The FAA currently issues ADs when we find that an unsafe condition exists in a product and the condition is likely to exist or develop in other products of the same type design. Because WFD could lead to a catastrophic failure due to reduction of the strength capability of the structure, we would issue an AD to address a finding of WFD in a particular product. An AD typically addresses an unsafe condition by requiring

<sup>2</sup> The FAA establishes a Maintenance Review Board comprised of subject matter experts who oversee development of a maintenance program for a specific airplane. In conjunction with the work of the review board, an industry steering committee comprised of representatives from the applicant, operators, and the FAA, analyzes maintenance requirements for that specific airplane. The review board and the steering committee then produce a Maintenance Review Board document that contains, among other tasks, inspections of the airplane structure. These inspections, in conjunction with any airworthiness limitation items established under § 25.271, address accidental damage, environmental damage, and fatigue damage.

inspection, modification, or replacement of certain structure, or a combination of these approaches. ADs are reactive and address only known instances of WFD. Additionally, ADs are directed towards a specific group of airplanes. Hence, WFD may go undetected in other airplanes with similar structures.

##### 4. Aging Aircraft Program

In October 1991, Congress enacted the Aging Aircraft Safety Act of 1991 (49 U.S.C. 44717) to address aging aircraft concerns. In response to the Act, the FAA published an interim final rule that amended §§ 121.368, 121.370a, 129.16, and 129.33 of the air carrier operating rules (67 FR 72726, December 6, 2002). Sections 121.368 and 129.33 require mandatory records reviews and airplane inspections after the airplane has been in service 14 years. In addition, §§ 121.370a and 129.16 require damage-tolerance-based inspections and procedures on airplanes operated under 14 CFR parts 121 and 129, respectively.

In response to the Aloha Airlines accident, the FAA formed the Airworthiness Assurance Task Force to investigate and propose solutions to the problems evidenced as a result of the accident. The task force was comprised of operators, manufacturers, and regulatory authorities. The task force recommended establishment of an Aging Airplane Program. Under the Aging Airplane Program, the FAA has mandated the following four separate programs:

- Supplemental Structural Inspection Programs for certain large transport category airplanes;
- Corrosion Prevention and Control Programs for certain large transport category airplanes;
- Repair Assessment Program to ensure existing and future repairs to the fuselage pressure boundary are assessed for damage tolerance.
- Mandatory Modification Program, based on the premise that to ensure the structural integrity of older airplanes there should be less reliance on repetitive inspections. (The determination of whether a modification is required is based on meeting certain criteria.)

These four programs or their equivalent make up the current structural maintenance program that operators incorporate into their maintenance or inspection programs to address aging structures. However, none of the programs address widespread fatigue damage.

5. Advisory Circulars

We have considered issuing Advisory Circulars (ACs) to give guidance on the changes needed to prevent WFD. Advisory Circulars, however, depend on voluntary compliance and are not enforceable. Therefore, use of ACs alone would ensure neither consistent results nor achievement of the WFD safety objectives for the current and future fleet.<sup>3</sup>

E. Summary of the Proposal

Long-term reliance on existing requirements, even those that

incorporate the latest mandatory changes introduced to combat structural degradation due to WFD, creates a risk of structural failure and related accidents because the requirements are inadequate to preclude WFD.

To address WFD, we need a proactive approach, i.e., address conditions affecting safe flight that we know can happen—before they happen. This approach would require persons to analyze the causes of WFD in relation to the entire airplane and to analyze repairs, alterations, and modifications installed on the airplane.

Based on the ARAC recommendations<sup>4</sup> and our own analysis, we have determined that operators, TC holders, and STC holders need to place more emphasis on WFD. This proposal is designed to heighten the awareness of the threat of WFD to airplanes and to change the current approach to maintaining and modifying them. Table 2 summarizes the proposed regulatory changes discussed today.

TABLE 2.—SUMMARY OF PROPOSED REGULATORY CHANGES ADDRESSING WFD

14 CFR	Description of proposal	Applies to	Compliance date
§ 25.571	Replace “design service goal” with “initial operational limit.” Require an initial operational limit as part of the Airworthiness Limitation Section (ALS) of the Instructions for Continued Airworthiness (ICA).	Future applicants for new Type Certificates (TC).	Before approval of TC by Aircraft Certification Office (ACO).
§ 25.1807	Require initial operational limits for all transport category airplanes with a Maximum Take-off Gross Weight (MTGW) greater 75,000 lb.  Establish WFD guidelines for assessing repairs, alterations, and modifications.	TC holders ..... Supplemental TC (STC) holders* Applicants for pending TCs and STCs.* Applicants for new STCs* and amended TCs.*	December 18, 2007. December 18, 2007. Later of December 18, 2007, or date of certificate. Later of December 18, 2007, or date of certificate.
§ 25.1809	Require WFD assessment of all existing, pending, and future structural design changes in relationship to initial operational limits; require development of any maintenance actions to preclude WFD.	TC holders (other than those covered by §25.1807). Applicants for pending and future STCs and amended TCs.	December 18, 2009. Later of December 18, 2009, or date of certificate. December 18, 2010. Later of December 18, 2010, or date of certificate.
§ 25.1811	Establish requirements for extending any operational limits.	Any person .....	Before approval of extension by ACO.
§ 25.1813	Establish requirements for evaluating certain repairs, alterations, and modifications proposed for installation on airplanes with an extended operational limit.	Any person seeking approval for repairs, alterations, or modifications.	Before approval of repairs, alterations, or modifications by ACO.
Appendix H to part 25	Require initial operational limits as part of the ALS of the ICA. Require guidelines for evaluating WFD effects of repairs, alterations, and modifications.	Applicants for future TCs .....	Before approval of TC by ACO.
§ 121.1115 § 129.115	Require operators to incorporate operational limits into their maintenance programs.  Require operators to incorporate any WFD airworthiness limitations for airplanes with extended operational limits.	U.S. certificate holders and foreign persons operating U.S.-registered transport category airplanes.  .....	June 18, 2008.  Before operating under extended operational limit.

<sup>3</sup> Voluntary safety assessments, such as those relating to the thrust reverser and cargo door reviews, have been difficult to complete in a timely manner because they lacked enforceability.

<sup>4</sup> “Structural Fatigue Evaluation for Aging Airplanes” (October, 1993); recommendation to add an appendix to AC 91–56, “Supplemental Structural Inspection Program (SSIP) for Large Transport Category Airplanes”; “Recommendations for Regulatory Action to Prevent Widespread

Fatigue Damage in the Commercial Fleet” Rev. A (June, 1999); “General Structures Harmonization Working Group Report Damage Tolerance and Fatigue Evaluation of Structures FAR/JAR § 25.571” (October, 2003).

TABLE 2.—SUMMARY OF PROPOSED REGULATORY CHANGES ADDRESSING WFD—Continued

14 CFR	Description of proposal	Applies to	Compliance date
	Establish requirements for identification and evaluation of certain repairs, alterations, and modifications installed on airplanes operating under an extended operational limit.	.....	Within 90 days after return to service, following repairs, alterations, or modifications.

\* Where STC increases MTGW to greater than 75,000 lb.

**Note.** There are also requirements for current holders of design approvals and those with pending design approvals to develop compliance plans, detailing how they will achieve compliance with the applicable requirements. For future applicants, similar information would be contained in a certification plan. To simplify the table above, these administrative requirements were omitted.

**III. Requirements for Design Approval Holders**

*A. Ongoing Responsibility of Type Certificate Holders for Continued Airworthiness*

Several recent safety regulations necessitated action by air carriers and other operators but did not require design approval holders to develop and provide the necessary data and documents to facilitate the operators' compliance. Operators are often dependent on action by a design approval holder before they can implement new safety rules. Ongoing difficulty reported by operators in attempting to meet these rules has convinced us that corresponding design approval holder (DAH) responsibilities may be warranted under certain circumstances to enable operators to meet regulatory deadlines. When DAHs fail to provide the required data in a timely manner, operators may be forced to incur the costs associated with obtaining the expertise to develop the data. Some examples of programs in which some DAHs did not develop and make available the necessary information in a timely manner include:

- Thrust reversers, where it took 10 years to develop some service information AD-related items;
- Class D to Class C Cargo Conversions, where one TC holder did not develop the necessary modifications in time to support operator compliance and where several operators were unable to obtain timely technical support and modification parts from STC holders;
- The Reinforced Flight Deck Door Program, where most operators had substantially less than the one-year compliance time originally anticipated because of delays in developing and certifying the new designs;
- Repair Assessment Rule, where some operators were required to develop their own data for FAA approval in order to meet the rule's compliance date; and

- Structural Repair Manuals, where operators are still awaiting DAH action to perform damage tolerance evaluations and establish inspections, even though the DAH committed to completing this activity by 1993.

In addition, DAHs have committed in the past to providing data to the FAA to support the certification basis of an airplane. In some instances, the DAH has missed the due date given for this commitment by up to 13 years.

We intend to require type-certificate holders, manufacturers and others to take actions necessary to support the continued airworthiness of and to improve the safety of transport category airplanes. Such actions include performing assessments, developing design changes, revising ICAs, and making available necessary documentation to affected persons. We believe this requirement is necessary to facilitate compliance by air carriers with operating rules that in effect demand the use of new safety features.

To address this problem, we propose to amend subpart A of part 25 to expand its coverage and to add a new subpart I to establish requirements for current holders. As discussed in our final rule, "Fuel Tank Safety Compliance Extension and Aging Airplane Program Update" (69 FR 45936, July 30, 2004), this and related proposals would add provisions to a new subpart I requiring actions by design approval holders that will allow operators to comply with our rules.

Part 25 currently sets airworthiness standards for the issuance of TCs and changes to those certificates for transport category airplanes. It does not list the specific responsibilities of manufacturers to ensure continued airworthiness of these airplanes once the certificate is issued. Therefore, we propose to revise § 25.1 by adding paragraph (c) to make clear that part 25 creates such responsibilities for holders of existing type and supplemental type certificates for transport category airplanes and applicants for approval of design changes to those certificates.

Paragraph (d) would be added to make part 25 applicable to persons seeking approval of repairs, alterations, or modifications of certain transport category airplanes. This latter category is included, because repairs, alterations, and modifications can affect the structural integrity of the airplane. These changes may have an adverse effect on the continued airworthiness of the airplane. Those seeking approval of these changes should be aware of these effects and address these issues if relevant.

In order to ensure the effectiveness of this change, we would also amend § 25.2(d) ("Special retroactive requirements") so as to require adherence to a new Subpart I which may require design changes and other activities by manufacturers when needed. The amended paragraph would also apply to persons seeking approval of repairs, alterations or modifications of transport category airplanes. This latter category is included because repairs, alterations and modifications can affect the structural integrity of the airplane. If the repairs, modifications or alterations are performed incorrectly, they may have an adverse effect on the continued airworthiness of the airplane.

This proposal would establish a new subpart I, Continued Airworthiness and Safety Improvements, where we would locate rules imposing ongoing responsibilities on design approval holders. On July 12, 2005, we issued policy statement PS-ANM110-7-12-2005, "Safety—A Shared Responsibility—New Direction for Addressing Airworthiness Issues for Transport Airplanes" (70 FR 40166). The policy states, in part, "Based on our evaluation of more effective regulatory approaches for certain types of safety initiatives and the comments received from the Aging Airplane Program Update (July 30, 2004), the FAA has concluded that we need to adopt a regulatory approach recognizing the shared responsibility between design approval holders (DAHs) and operators. When we decide that general

rulemaking is needed to address an airworthiness issue, and believe the safety objective can only be fully achieved if the DAHs provide operators with the necessary information in a timely manner, we will propose requirements for the affected DAHs to provide that information by a certain date.”

We believe that the safety objectives contained in this proposal can only be reliably achieved and acceptable to the FAA if the DAHs provide the operators with the initial operational limits required by the proposed operational rules for parts 121 and 129. Our determination that DAH requirements are necessary to support the initiatives contained in this proposal is based on several factors:

- Developing initial operational limits is complex. Only the airplane manufacturer, or DAH, has access to all the necessary type design data needed for the timely and efficient development of the required initial operational limit.

- FAA-approved operational limits need to be available in a timely manner. Due to the complexity of these initial operational limits, we need to ensure that the DAHs submit them for approval on schedule. This will allow the FAA Oversight Office having approval authority to ensure that the initial operational limits are acceptable, are available on time, and can be readily implemented by the affected operators.

- The proposals in this NPRM affect a large number of different types of transport airplanes. Because the safety issues addressed by this proposal are common to many airplanes, we need to ensure that technical requirements are met consistently and the processes of compliance are consistent. This will ensure that the proposed safety enhancements are implemented in a standardized manner.

- The safety objectives of this proposal need to be maintained for the operational life of the airplane. We need to ensure that future design changes to the type design of the airplane do not degrade the safety enhancements achieved by the incorporation of initial operational limits. We need to be aware of future changes to the type designs to ensure that these changes do not invalidate initial operational limits developed under the requirements of this proposal.

Based on the above reasons and the stated safety objectives of FAA policy PS-ANM110-7-12-2005, we are proposing to implement DAH requirements applicable to operational limits.

In the past, this type of requirement took the form of a Special Federal

Aviation Regulations (SFAR). These regulations are difficult to locate because they are scattered throughout Title 14. Placing all these types of requirements in a single subpart of part 25 which contains the airworthiness standards for transport category airplanes would provide ready access to critical rules.

In preliminary discussions with foreign aviation authorities with whom we try to harmonize our safety rules, they have expressed concern about consolidating parallel requirements in their counterparts to part 25. They have suggested that it may be more appropriate to place them in part 21 or elsewhere. Therefore, we specifically request comments from the public, including foreign authorities, on the appropriate place for these airworthiness requirements for type certificate holders.

We reserve additional sections in this proposed subpart to include other future aging airplane rules, several of which are under development. Some of these proposals include similar language establishing the general airworthiness responsibilities of manufacturers and thus include some overlapping provisions. Once any proposal establishing these broad responsibilities becomes a final rule, we will delete the duplicative requirements from the other proposals and retain only that language pertinent to any specific new safety regulations (such as fuel-tank flammability reduction).

However, the ongoing-airworthiness requirements in Subpart I would not by their terms reach applicants for TCs with respect to new projects for which application is made after the effective date of the proposed rule. This is unnecessary, because when we adopt a new requirement for TC holders, there will be a corresponding amendment to part 25 expressly making the new, or a similar safety standard a condition for receiving a TC in the future. For example, in this proposal, the new requirements of § 25.571 regarding WFD will govern future applications.

For safety reasons, however, we are requiring that any application for a type design change not degrade the level of safety already created by the TC holder's presumed compliance with the subpart I rule. Currently, when reviewing an application for such a change, we employ the governing standards stated in part 21, specifically § 21.101. That section generally requires compliance with standards in effect on the date of application but contains exceptions that may allow applicants to show compliance with earlier standards. For example, if a change is not considered

“significant,” the applicant may be allowed to show compliance by pointing to standards that applied to the original TC. (See AC 21.101-1, “Establishing the Certification Basis of Changed Aeronautical Products,” a copy of which can be downloaded from <http://www.airweb.faa.gov/rgl>).

With the adoption of subpart I rules, we must ensure that safety improvements that result from TC holder compliance with these requirements are not undone by later modifications. Therefore, even when we determine under § 21.101 that applicants need not comply with the latest airworthiness standards, they will be required to demonstrate that the change would not degrade the level of safety provided by the TC holder's compliance with the subpart I rule. In the context of this proposal, for example, this will mean that an applicant for approval of a design change would have to perform a WFD evaluation to determine if any maintenance actions are necessary to preclude WFD.

#### *B. Applicability*

##### 1. Holders of Type Certificates and Supplemental Type Certificates

This proposal, if adopted, would impose requirements on TC holders for all large transport category airplanes. Under § 25.571, an applicant for a TC would have to establish an initial operational limit for the contemplated airplane design as part of its application. Likewise, existing TC holders would have to establish an initial operational limit for all large transport category airplanes under § 25.1807 if the MTGW of the airplane exceeds 75,000 lb. Type certificate and STC holders would also have to establish an initial operational limit for all large transport category airplanes under § 25.1807 if the MTGW of the airplane was 75,000 pounds or less, and later increased to greater than 75,000 pounds by an amended type certificate or supplemental type certificate.

This proposal, if adopted, would apply not only to domestic TC and STC holders, but also to foreign TC and STC holders. This rule would be different from most type certification programs for new TCs, where foreign applicants typically work with their responsible certification authority and the FAA relies to some degree upon that authority's findings of compliance under bilateral airworthiness agreements. Presently no other certification authority has adopted requirements addressing WFD for existing TCs. Additionally, while some

authorities have indicated an interest in adopting some type of requirements for new airplane designs, they may not adopt requirements applicable to existing TCs.

Accordingly, the FAA will retain the authority to make all the necessary compliance determinations and, where appropriate, may request certain compliance determinations by the appropriate foreign authorities using procedures developed under the bilateral agreements. The compliance planning provisions of this proposed rule are equally important for domestic and foreign TC and STC holders and applicants, and we will work with the foreign authorities to ensure that their TC and STC holders and applicants perform the planning necessary to comply with those requirements.

## 2. Airplanes

If adopted, this rule would apply, with some exceptions discussed below, to large transport category airplane designs (MTGW greater than 75,000 pounds) by virtue of either the original certification of the airplane or a later increase in its MTGW. All transport category airplanes certificated under a TC that was applied for after the effective date of the final rule would also be subject to the requirements proposed today. This combined approach would result in the coverage of airplanes where the safety benefits and the public interest are the greatest.

The ARAC working group that developed this recommendation did not include design approval holders for airplanes of less than 75,000 pounds MTGW, in part because they were not asked to do so. However, in addition to its WFD recommendations, this working group developed recommendations on other aging airplane issues, including the Supplemental Structural Inspection Program, the Corrosion Prevention and Control Program, the Repair Assessment Program, and the Mandatory Modification Program. Because of these efforts, design approval holders for large transport category airplanes have already developed the technology and the internal organizational capability to address WFD. Therefore, the 75,000 pound MTGW is a logical reference point for developing programs for addressing WFD.

We considered applying this proposal to all existing part 25 airplanes. However, we have determined that smaller regional jets do not currently present a risk of WFD sufficient to justify the cost associated with meeting this proposal.

The 75,000-pound cutoff excludes about 1,600 regional jets that are

operating under parts 121 and 129 today. Of those airplanes, there are approximately 430 regional jets that are at least eight years old. These airplanes have accumulated an average of 12,000 flight cycles. The regional jet with the greatest number of flight cycles is 11 years old and has accumulated about 26,000 flight cycles, well below the existing design service goal for this airplane of 60,000 flight cycles.

The FAA recognizes that using a cutoff of 75,000 pounds does not align with the FAA's "One Level of Safety" initiative (that is, the same level for all airplanes used in air carrier service). However, we determined a cutoff of 75,000 pounds to be appropriate at this time for the following reasons:

- This is the same cutoff used for the four aging airplane programs mentioned above, and the affected type certificate holders are able to address these problems now.
- Some airplanes over 75,000 pounds are at a greater risk due to higher total cycles and age.
- Most air carrier airplanes are of this size, and many of them are near or over their design service goal.
- The regional jets not affected are relatively young and, therefore, at low risk relative to WFD.
- The high-cycle regional jet will be in service for an additional 14 years before reaching its design service goal.

The FAA may determine that we need to expand the scope of this rule at a later time, based on evaluations of the potential for WFD in regional jets. All of these regional jets are manufactured in other countries, and any efforts to address WFD should be developed in coordination with those countries. Until that time, if WFD problems are identified in these airplanes, we will address them through airworthiness directives. No WFD problems have yet been identified for regional jets. The FAA requests comments on this aspect of the proposed rule.

While the ARAC recommendations applied to all transport category airplanes over 75,000 pounds, the group of airplanes of most concern is that group operating under parts 121 and 129. Because carriers in scheduled operations fly airplanes operated under those parts, they are flown more often than other airplanes of comparable size and are accordingly more likely to develop WFD. Thus, this proposal would exclude airplanes over 75,000 pounds that are not operated under parts 121 or 129. For this reason, we have tentatively decided that this proposal, if adopted, should exclude the Bombardier BD-700, the Gulfstream G-V, the Gulfstream G-VSP, and the

British Aerospace, Aircraft Group and Societe Nationale Industrielle Aerospatiale Concorde Type 1.

It is not clear at this time that the possible benefits of this rule for those airplanes would be proportionate to the cost involved. We request comments on the feasibility and benefits of including or excluding these airplanes. We also request comments on the feasibility of including or excluding any other transport category airplanes with a maximum takeoff gross weight greater than 75,000 pounds from the requirements of this provision, whether or not they are operated under parts 121 and 129.

### C. Initial Operational Limit (§ 25.571, § 25.1807)

Under this proposal, design approval holders would be required to establish an initial operational limit<sup>5</sup> for all transport airplanes if certificated under a new TC and for those transport airplanes over 75,000 pounds if certificated under an existing TC. Demonstration that WFD will not occur prior to the initial operational limit typically would involve an evaluation of the airplane model using fatigue test evidence, analyses, and airplane service information. Initial operational limits may also include specified maintenance actions necessary to preclude WFD, which would be addressed through the airworthiness directive process.<sup>6</sup>

Airplane owners or operators may need to take certain maintenance actions to support the operational limits. These actions may include additional inspections, structural modifications, or replacements. The inspections would include an inspection start point and repetitive inspection intervals, along with inspection methods. Because inspections may not be reliable in detecting MSD or MED, structural modification points, which may include modifications or replacements, may eventually be required. Means of compliance with the requirements for performing a WFD evaluation and establishing an inspection start point and structural modification points will be further described in a proposed AC.

To establish an initial operational limit, the FAA recognizes that the structural configuration of the airplane

<sup>5</sup> The most direct method for limiting the operation of an airplane is to prohibit operation beyond a certain point. For the purpose of this rule, we are using the term "operational limit of an airplane" rather than "limit of validity of the maintenance program" as recommended by ARAC.

<sup>6</sup> We intend to use the AD process, so that operators will have an opportunity to comment on the contemplated maintenance actions.

needs to be identified. Thus, § 25.1807 would specify the airplane structural configurations that must be evaluated. As a minimum, the structural configuration would consist of all model variations and derivatives approved under the type certificate and all structural modifications and replacements mandated by ADs as of the effective date of the rule. These ADs would only be those issued against any configurations developed by TC holders. They would not be for any ADs issued against modifications defined by an STC installed on affected airplanes. The result would be an airplane structural configuration that is clearly understood by both industry and the FAA.

The initial operational limit would be stated as a number of total accumulated flight cycles or flight hours. An initial operational limit based on flight hours may be required for structure, such as the wings, that typically accumulates fatigue damage due to the repeated flight loads that occur on an airplane over time. An initial operational limit based on flight cycles may be required for structure, such as the fuselage, that typically accumulates fatigue damage due to the pressurization and depressurization of an airplane. There is no way to correlate between the two limits without knowing the applicable design and operational variables, such as average flight length. Accordingly, design approval holders may need to establish both a flight hour limit and a flight cycle limit.

The initial evaluation of the airplane structural configuration should identify a projected airplane usage beyond its design service goal (DSG). This projected airplane usage is also known as the "proposed extended service goal" (ESG). Typically, an evaluation through at least an additional twenty-five percent of the DSG would provide a realistic ESG. The ESG would be based on an additional evaluation of the airplane structural configuration and depends on the following:

- The projected useful life of the airplane at the time of the initial evaluation;
- Current inspection techniques and procedures; and
- Airline advance planning requirements for introduction of new maintenance actions, to support the ESG.

Design approval holders may select DSGs or ESGs as starting points for

establishing initial operational limits. Service information may be available for design approval holders to make those initial operational limits higher. In fact, the FAA is aware that design approval holders may have service information, such as service bulletins or all operator letters that could have an impact on proposed initial operational limits, but have not been mandated by AD. We are also aware that these persons may be in the process of developing service information that could have an impact on proposed initial operational limits. They may choose to specify additional maintenance actions resulting from such service information that could result in higher initial operational limits.

Accordingly, the proposed rule includes an option for design approval holders to use existing maintenance actions for which service information has not been mandated by AD. These maintenance actions would be in addition to the airplane structural configurations that design approval holders would evaluate under the proposed regulation. To use this option, the affected design approval holders would be required to submit a list identifying the existing maintenance actions to the FAA oversight office. The affected design approval holders would then establish initial operational limits based on WFD evaluations that take credit for existing maintenance actions.

The proposed rule also includes an option for affected design approval holders to use maintenance actions for which service information has not been issued. Those maintenance actions would be in addition to the airplane structural configurations that must be evaluated. To use this option, the affected persons would be required to submit a list identifying each of those maintenance actions and a binding schedule for providing in a timely manner the necessary service information for those actions to the FAA oversight office. The binding schedule is necessary to ensure the applicable service information is provided to the FAA in sufficient time for the agency to issue ADs mandating these actions, and operators to comply with them before WFD occurs. The design approval holders would then establish initial operational limits based on WFD evaluations that take credit for maintenance actions for which service information has not been issued.

The WFD evaluation would consist of identifying structure susceptible to multiple site damage or multiple element damage based on the configurations discussed above. Once the structure has been identified, affected design approval holders would determine when WFD is likely to occur. This WFD evaluation would be based on consideration of the following:

- Service history: reported findings of multiple site damage or multiple element damage.
- Test data: WFD information from past component or full-scale test results. This could include information on susceptibility of structure to WFD, crack initiation life, crack growth life, and residual strength.
- Fatigue analyses: predictions of times when multiple site damage or multiple element damage cracking would occur.
- Damage tolerance analyses: predictions of multiple site damage or multiple element crack growth life and residual strength.
- Teardown inspections of high-usage airplanes.

Certain design approval holders have revealed to the FAA their plans to establish initial operational limits that would be 130 to 150 percent of the DSG or ESG for their airplanes. They have also started to identify the necessary maintenance actions, including the inspection and modification start points, to preclude WFD up to the established initial operational limits for these airplanes. Many inspection and modification start points would be approximately at the design service goal or, in some cases, at 125 percent of the design service goal. This would support an initial operational limit that could be substantially higher than the DSG or ESG for a particular airplane. Other design approval holders have indicated that the initial operational limits for their airplanes would be at DSG or ESG. This is because relatively few of their airplanes are in operation today or all of their airplanes are many years away from accumulating the number of flight cycles shown in Table 3.

Table 3 provides estimates of DSGs and ESGs of various airplanes that would be affected by this proposal. These DSGs and ESGs are based on information provided by type certificate holders or on a conservative estimate by the FAA.



TABLE 3.—DESIGN AND EXTENDED SERVICE GOALS

Airplane type	Type certificate	Service goals (in flight cycles)
<b>Airbus:</b>		
A300 B2-1A, B2-1C and B2K-3C .....	A35EU .....	48,000
A300 B4-2C and B4-103 .....	A35EU .....	40,000
A300 Model B4-203 .....	A35EU .....	34,000
A300 B4-600 Series, B4-600R Series and F4-600R Series .....	A35EU .....	30,000
A310-200 Series .....	A35EU .....	40,000
A310-300 Series .....	A35EU .....	35,000
A319 (all models) .....	A28NM .....	48,000
A320 (all models) .....	A28NM .....	48,000
A321 (all models) .....	A28NM .....	48,000
A330 (all models) .....	A46NM .....	40,000
A340 (all models) .....	A43NM .....	20,000
<b>Boeing:</b>		
Boeing 707 (-100 series and -200 series) .....	4A21 .....	20,000
Boeing 707 (-300 series and -400 series) .....	4A26 .....	20,000
Boeing 717 (all models) .....	A6WE .....	60,000
Boeing 720 .....	4A28 .....	30,000
Boeing 727 .....	A3WE .....	60,000
Boeing 737 .....	A16WE .....	75,000
Boeing 747 .....	A20WE .....	20,000
Boeing 757 .....	A2NM .....	50,000
Boeing 767 .....	A1NM .....	50,000
Boeing 777 .....	T00001SE .....	44,000
<b>Bombardier Aerospace Model:</b>		
CL-44D4 and CL-44J .....	1A20 .....	20,000
<b>British Aerospace Airbus, Ltd.:</b>		
BAC 1-11 (all models) .....	A5EU .....	85,000
<b>British Aerospace (Commercial Aircraft) Ltd.:</b>		
Armstrong Whitworth Argosy A.W. 650 Series 101 .....	7A9 .....	20,000
<b>BAE Systems (Operations) Ltd.:</b>		
BAE 46 (all models) and Avro 146 .....	A49EU .....	50,000
RJ70A, RJ85A and RJ100A (all models) .....		
<b>Fokker:</b>		
F28/F70/F100 (all models) .....	A20EU .....	90,000
<b>Lockheed:</b>		
300-50A01 (USAF C 141A) .....	A2SO .....	20,000
L-1011 (all models) .....	A23WE .....	36,000
L188 (all models) .....	A1SO .....	26,600
382 (all models) .....	4A22 .....	20,000
1649A-98 .....	4A17 .....	20,000
1049-54, 1049B-55, 1049C-55, 1049D-55, 1049E-55, 1049F-55, 1049G-82 .....	6A5 .....	20,000
49-46, 149-46, 649-79, 649A-79, 749-79, 749A-79 .....	A-763 .....	20,000
<b>McDonnell Douglas:</b>		
DC-6 .....	A-781 .....	20,000
DC-6A (all models) .....	6A3 .....	20,000
DC-6B (all models) .....	6A4 .....	20,000
DC-7 (all models) .....	4A10 .....	20,000
DC-8 (all models) .....	4A25 .....	50,000
DC-9 (all models) .....	A6WE .....	100,000
DC-10-10 .....	A22WE .....	42,000
DC-10-30, -40 .....	A22WE .....	30,000
MD-10-10F .....	A22WE .....	42,000
MD-10-30F .....	A22WE .....	30,000
MD-11 (all models) .....	A22WE .....	20,000
MD-80 (all models) .....	A6WE .....	50,000
MD-90-30 .....	A6WE .....	60,000

*D. Instructions for Continued Airworthiness (§ 25.571, § 25.1807, § 25.1811, Appendix H)*

We propose to require inclusion of the initial operational limit in the ALS of the ICA. This limit would be stated as a number of total accumulated flight cycles or flight hours. We will publish a notice in the **Federal Register** informing the public that the initial operational limits are available on an FAA website when this information is received from the design approval holders.

- For those persons that applied for a TC after the effective date of the rule, the ICA, which includes the ALS, would be provided with an airplane upon delivery. This ICA would also include guidelines to assist in addressing future repairs, alterations, and modifications so that they do not compromise this initial operational limit.

- For those TC holders that currently have an ALS, the ALS would be revised to include the initial operational limit. For those TC holders with airplanes that currently do not have an ALS, the ALS would be established to include the initial operational limit.

- For any person who applies for an extended operational limit, we propose to require inclusion of that limit in a supplement to the ALS. This extended operational limit may include service information documented as airworthiness limitation items that must be accomplished to support the extended operational limit.

The ALS is required by current part 25 and includes those items that have mandatory inspection or replacement times related to structure. However, the current part 25 ALS and ICA requirements apply only to airplanes certified after amendment 25–54 became effective in 1980. As a result, they are not applicable to many current airplanes.

For those TC holders with airplanes that currently do not have an ALS, the ALS would address only initial operational limits. This proposal would not require that the ALS for these airplanes include the other requirements for an ALS established under amendment 25–54 to part 25, or a later amendment.

Assuming the final rule for this proposal is effective December 18, 2006, this proposal would set a 12-month timeframe for development of the ALS, unless previously accomplished, to include initial operational limits. TC holders would be required to comply by December 18, 2007. Persons who have pending applications for TCs would be required to comply by December 18,

2007, or the date a certificate is issued, whichever occurs later. Holders or applicants for STCs, or amendments to TCs, that increase the maximum takeoff gross weight to greater than 75,000 pounds would be required to comply by December 18, 2007, or, in the case of applicants, the date a certificate is issued, whichever occurs later.

In determining the compliance schedules for the proposed requirements, we balanced the safety-related reasons for the rule against the need to give industry sufficient time to comply. Therefore, before setting the proposed compliance dates for analysis completion, we considered the following:

- Alignment with current or planned compliance dates of several aging-related rulemakings, such as the Aging Airplane Safety rule (FR cite), Fuel Tank System safety initiatives (69 FR 45936, 66 FR 23086), and Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety (69 FR 58508, October 6, 2005).

- Safety improvements that will result from compliance with this rule.

- Industry's current efforts to incorporate some of these safety initiatives.

However, the rulemaking process took longer than originally anticipated. Consequently, given the specific compliance dates in the proposed rulemaking and the likelihood that finalization of the rules will be later than expected, there may not be as much time allowed for compliance as originally planned. We recognize that compliance intervals may need to be adjusted and will consider your comments on this condition.

*E. Service Information and Guidelines for Repairs, Alterations and Modifications (§ 25.1807(g), Appendix H)*

The proposal would require affected persons to submit for FAA approval WFD service information and guidelines for addressing repairs, alterations, and modifications. Operators often use manufacturers' data, such as structural repair manuals and service bulletins, to repair or modify their airplanes. Such repairs or modifications could be made at any time during the service life of the airplane. This proposal would require TC holders to evaluate repairs and modifications identified in their structural repair manuals, service bulletins, and other service information and design approvals. The evaluation of these repairs and modifications is necessary to determine if and when WFD is likely to occur. If the evaluation concludes that WFD is likely to occur

before the initial operational limit, then service information for maintenance actions must be developed and submitted to the FAA oversight office for approval. Once approved, we would issue ADs that would require operators to perform the maintenance actions.

Because TC holders are the only persons with sufficient knowledge of the airplane to be able to develop the guidelines, they would also be required to develop and submit WFD guidelines for evaluating repairs, alterations, and modifications susceptible to WFD other than those for which they are responsible. The guidelines would use criteria similar to those used to evaluate the full airplane structural configurations discussed above and could include service history, fatigue analysis, test data, or damage tolerance analysis. The guidelines would provide a means to identify repairs, alterations, or modifications that may be susceptible to WFD. As discussed earlier, we have tasked ARAC to provide recommendations for methods to develop this type of guidance. We will provide guidance for development of these guidelines in a proposed AC.

We anticipate the guidelines would have the necessary data to allow others to identify and perform an evaluation of repairs, alterations, and modifications. Also, these guidelines would support identification and evaluations of STCs and repairs, alterations, and modifications to those STCs. They could be used to develop extended operational limits and evaluate repairs, alterations, and modifications for those airplanes with extended operational limits. These guidelines would contain data for development of service information that would include possible maintenance actions that, as stated earlier, may include inspection start points, structural modification points, and inspection intervals and methods.

We propose a compliance date of December 18, 2009, or the date the certificate is issued, whichever occurs later, for affected persons to submit service information and guidelines for approval by the FAA oversight office. We consider development of initial operational limits to be the most pressing concern. Accordingly, we would provide TC holders and applicants with additional time to address repairs, alterations, and modifications after the development of initial operational limits. This will enable TC holders and applicants to use the results of the ARAC tasking discussed earlier.

*F. Changes to Type Certificates (STCs and Amended TCs) (§ 25.1809)*

STC holders, or applicants for design changes, would be required to perform a WFD evaluation to determine if the design change, or structure affected by the design change, requires maintenance actions prior to the initial operational limit.<sup>7</sup> Affected structure can be new structure installed by a design change or existing structure modified by a design change. Structure may be affected if it is physically changed or there is a change or redistribution of internal loads. The following types of repairs, alterations or modifications are likely to have WFD implications:

- Passenger-to-freighter conversions (including addition of main deck cargo doors).
- Gross weight increases (increased operating weights, increased zero fuel weights, increased landing weights, and increased maximum takeoff weights).
- Installation of fuselage cutouts (passenger entry doors, emergency exit doors or crew escape hatches, fuselage access doors, and cabin window relocations).
- Complete re-engine or pylon modifications.
- Engine hush-kits and nacelle alterations.
- Wing modifications such as installing winglets or changes in flight control settings (flap droop), and alteration of wing trailing edge structure.
- Modified, repaired, or replaced skin splices.
- Any modification, repair, or alteration that affects several stringer or frame bays.
- A modification that covers structure requiring periodic inspection by the operator's maintenance program.
- A modification that results in operational mission change that significantly changes the manufacturer's load or stress spectrum, e.g., passenger-to-freighter conversion.
- A modification that changes areas of the fuselage that prevents external visual inspection, e.g., installation of a large external fuselage doubler that results in hiding details beneath it.

This proposal would require evaluation of affected structure and any additional service information to determine if the structure is susceptible to multiple site damage or multiple element damage. This evaluation would be performed using manufacturers' guidelines or guidelines approved by

the FAA oversight office. Affected persons would be required to use one of the approved procedures for screening design changes for standardization purposes. The proposed requirements would impose the same level of evaluation as proposed for TC holders in determining an initial operational limit.

The guidelines would provide affected persons with a means to identify whether affected structure is susceptible to WFD. It would also provide a standardized WFD methodology for evaluating any design changes and determining their impact on surrounding structure. The guidelines would specify criteria to determine if additional maintenance actions are required. If an affected person determines that the design change does not cause a WFD concern, then no further action is required.

For future design changes, the ALS developed with the ICA would include any associated service information that is necessary to enable the airplane to reach the initial operational limit. This service information would be documented as airworthiness limitation items (ALIs). Under § 91.403(c), compliance with airworthiness limitations is mandatory, so the effect of documenting these actions as ALIs is that operators using the design change would be required to do them.

The following compliance dates for evaluating design changes and developing service information for maintenance actions that must be performed to preclude WFD would need to be met:

- Holders of STCs: no later than December 18, 2010.
- Applicants for STCs and for amendments to STCs: no later than December 18, 2010, or the date the certificate is issued, whichever occurs later.

*G. Extended Operational Limit (§ 25.1811, § 25.1813)*

This proposal, if adopted, would permit operation of an airplane past its existing (initial or extended) operational limit if a person were able to demonstrate that WFD will not occur in the airplane up to the proposed extended operational limit. Any person wanting to operate beyond an existing operational limit would be required to perform an evaluation to that end as part of the amended TC (subpart D of part 21) or STC (subpart E of part 21) process. The extended operational limit may also include specified maintenance actions necessary to preclude WFD, which would be part of the extended operational limit approval. Extended

operational limits would be established in an ALS using the requirements of § 25.1529, along with corresponding ALIs. This proposed requirement does not specify a compliance plan since the normal process for obtaining approvals under the provisions of subparts D and E of part 21 already contemplates such a plan.

To establish an extended operational limit, the structural configuration of each affected airplane needs to be identified as follows:

- All model variations and derivatives approved under the type certificate for which extension is sought.
- Any maintenance actions identified by the TC or STC holder as necessary to support the initial operational limit established under § 25.571 or § 25.1807.
- All structural repairs, alterations, and modifications installed on each affected airplane, whether or not required by AD, up to the date of approval of the extended operational limit.

Unlike the proposed requirements for initial operational limits, applicants might have to conduct separate evaluations on each affected airplane because of configuration differences rather than relying on a single evaluation for a group of airplanes. The configuration for any one airplane may consist of repairs, alterations, or modifications that are unique to that airplane. Applicants might also need to consider additional fatigue testing because the fatigue testing that supported the initial operational limit may not be sufficient to support the proposed extended operational limit. The service information for any necessary maintenance actions would be documented as an ALI.

Extending the operational limit of an airplane raises implications for the validity of any subsequent repairs, alterations or modifications. Accordingly, any person seeking approval for installation of any repair, alteration, or modification would be required to perform an evaluation of that repaired, altered, or modified structure. Persons seeking approval of any repair, alteration, or modification would be required to use the guidelines specified in § 25.1807, or other guidelines approved by the FAA oversight office. The guidelines would provide a standardized WFD methodology for evaluating any repair, alteration, or modification.

The evaluation might conclude that a proposed repair, alteration, or modification is not susceptible to WFD or that WFD is not likely to occur before the subject airplane reaches the extended operational limit. As a result,

<sup>7</sup> Those design changes that increase the maximum takeoff gross weight from 75,000 pounds or less, to greater than 75,000 pounds would be excluded, because they are covered in § 25.1807.

the person seeking approval would not be required to take any further actions for that proposed repair, alteration, or modification. Conversely, the evaluation might conclude that WFD is likely to occur before the affected airplane reaches the extended operational limit. Such an evaluation would require persons seeking approval to show that WFD is not likely to occur up to that limit either by modifying the proposed repair, alteration, or modification or by developing maintenance actions to be performed by the affected operator at identified times.

#### *H. Compliance Plan (section 1807, section 1809)*

The FAA intends to establish the requirements for a compliance plan to ensure that affected persons and the FAA have a common understanding and agreement of what is necessary to achieve compliance with these sections. The plan will also ensure that the affected persons produce the ALS and service information and guidelines in a timely manner that are acceptable in content and format. Integral to the compliance plan will be the inclusion of procedures to allow the FAA to monitor progress toward compliance. These aspects of the plan will help ensure that the expected outcomes will be acceptable and on time for incorporation by the affected operators into their maintenance programs in accordance with the operational rules contained in this proposal.

The affected design approval holders would be required to submit a compliance plan that addresses the following:

- The proposed schedule for meeting the compliance dates, including all major milestones.
- A proposed means of compliance with the initial operational limit requirement.
- Any planned deviations from guidance provided in FAA advisory material.
- A draft of all required compliance items not less than 60 days before the stated compliance dates.
- Repairs, alterations, and modifications.
- Continuous assessment of the affected large transport category airplane fleet relative to the potential for WFD prior to the initial operational limit.
- Distribution of approved initial operational limits.

The compliance plan is based substantially on "The FAA and Industry Guide to Product Certification," which describes a process for developing project-specific certification plans for

type certification programs, which is available at <http://www.faa.gov/certification/aircraft>.

This guide recognizes the importance of ongoing communication and cooperation between applicants and the FAA. This proposal, while regulatory in nature, is intended to encourage the establishment of the same type of relationship in the process of complying with this section.

One of the items required in the plan is, "If the proposed means of compliance differs from that described in FAA advisory material, a detailed explanation of how the proposed means will comply with this section." We will issue an AC to include guidance on the aspects of a compliance plan. FAA advisory material is never mandatory because it describes one means, but not the only means of compliance. In the area of type certification, applicants frequently propose acceptable alternatives to the means described in advisory circulars. When an applicant chooses to comply by an alternative means, it is important to identify this as early as possible in the certification process to provide an opportunity to resolve any issues that may arise that could lead to delays in the certification schedule.

The same is true of the requirement for design approval holders. As discussed earlier, compliance with this section on time by design approval holders is necessary to enable operators to comply with the operational requirements of this NPRM. Therefore, this item in the plan would enable the FAA oversight office to identify and resolve any issues that may arise with the proposal of the design approval holder without jeopardizing the ability of the design approval holder to comply by the compliance time.

This proposal, if adopted, would require TC holders and applicants to correct a deficient plan, or deficiencies in implementing the plan, in a manner identified by the FAA oversight office. Before the FAA formally notifies a TC holder or applicant of deficiencies, we will communicate with them to try to achieve a complete mutual understanding of the deficiencies and means of correcting them. Therefore, the notification referred to in this paragraph should document the agreed corrections.

The ability of an operator to comply with the proposed operating rules will be dependent on TC holders, certain STC holders, and applicants complying with § 25.1807. The FAA will carefully monitor compliance and take appropriate action if necessary. Failure to comply by the specified dates would

constitute a violation of the requirements and may subject the violator to certificate action to amend, suspend, or revoke the affected certificate (49 U.S.C. 44709). It may also subject the violator to a civil penalty of not more than \$25,000 per day per certificate until the violator complies with § 25.1807 (49 U.S.C. 46301).

This proposal, if adopted, would require a compliance date of March 18, 2007, for affected persons to submit a compliance plan to the FAA oversight office for approval. For those persons applying after the effective date of the rule for STCs or amendments to TCs that increase maximum takeoff gross weights from 75,000 pounds or less, to greater than 75,000 pounds, a plan for WFD compliance would be part of the overall compliance plan for those STCs or amendments to TCs. The affected persons would not have to address WFD until a compliance plan defining the certification basis for the overall STC or amended TC is needed. Those persons would have to comply by March 18, 2007, or within 90 days after the date of application, whichever occurs later.

The proposal also specifies compliance dates for submitting compliance plans for evaluating design changes and developing service information for maintenance actions that must be performed to preclude WFD. The compliance dates for the affected persons are as follows:

- Holders of STCs: no later than March 18, 2008.
- Applicants for STCs and amendments to TCs, if the certificate was not issued before the effective date of the final rule: no later than March 18, 2008, or within 90 days after the date of application, whichever occurs later.

#### **IV. Proposed Operational Rules**

In recent years, the FAA has identified a number of fleet-wide continued airworthiness issues that are not limited to particular type designs. Historically, we have issued ADs to require airplane operators to take corrective action to address these airworthiness issues. ADs are described in part 39. They address unsafe conditions that we determine are likely to exist or develop on other products of the same type design. Although ADs may be used to address fleet-wide issues, they are often more effective in addressing individual airplane issues. Accordingly, we believe that general rulemaking may be a more efficient and appropriate way to address fleet-wide safety problems. These new subparts provide locations for these types of requirements.

Earlier in this document, we described the proposed creation of a new subpart I in part 25. That subpart would provide a common location for similar regulatory requirements. We are also proposing new subparts in parts 121 and 129. These new subparts would contain rules from this proposal and other existing and future rules that pertain to continued airworthiness, in particular rules that address aging airplane issues. The FAA believes that the new subparts will enhance the reader's ability to readily identify rules pertinent to continued airworthiness. Unless we say otherwise, our purpose in moving requirements to the new subparts is to ensure easy visibility of those requirements applicable to the continued airworthiness of the airplane. We do not intend to change their legal effect in any other way.

A new subpart AA would be added to part 121 dealing with domestic air carriers and a new subpart B would be added to part 129 foreign air carriers and foreign persons operating U.S.-registered airplanes. This proposal, if adopted, would require persons holding an air carrier or operating certificate under part 119 to support the continued airworthiness of their airplanes. While most of the requirements of these subparts would address the need for improved maintenance, these subparts may also include requirements to modify airplanes or take other actions that we consider necessary for continued airworthiness.

After June 18, 2008, an affected operator could not operate an airplane unless the operator has incorporated an ALS approved under appendix H to part 25 or § 25.1807 into its maintenance program. This ALS would contain the operational limit stated as a number of total accumulated flight cycles or flight hours approved under § 25.571 or § 25.1807. Furthermore, the ALS must be clearly distinguishable within the certificate holder's maintenance program. This means the ALS must be designated as a stand-alone portion of the program.

Under both current and proposed § 25.571, the FAA may issue a type certificate for an airplane model prior to completion of full-scale fatigue testing. Under this proposal, the type certificate holder would establish the initial operational limit upon completion of this testing. As under current § 25.571, the FAA intends for operators to be able to operate these airplanes while the design approval holder is performing the fatigue testing. Therefore, this proposal would not change the current provisions of § 25.571 that, if a type certificate is issued prior to completion

of full-scale fatigue testing, the ALS must include a number equal to  $\frac{1}{2}$  the number of cycles accumulated on the fatigue test article. As additional cycles on the test article are accumulated, the number may be adjusted accordingly. This number is an Airworthiness Limitation and no airplane may be operated beyond the number stated in the ALS until the fatigue testing is completed and the initial operational limit is established.

Further operation would be prohibited unless an extended operational limit is incorporated into the operator's maintenance program, as discussed below.

To use an extended operational limit, the proposal would require operators to revise their maintenance programs to do the following:

- Incorporate the ALS containing the extended operational limit and any WFD ALI approved under § 25.1811.
- Incorporate the applicable guidelines for identifying and evaluating repairs, alterations, and modifications, that have been developed under § 25.1807, or other guidelines approved by the FAA oversight office.
- Make the extended operational limit, WFD ALIs, and applicable guidelines clearly distinguishable.

The extended operational limit might also have WFD ALIs because the evaluation performed under § 25.1811 concluded that WFD may occur on certain structure before the extended operational limit is reached. These WFD ALIs may include inspection start points, structural modification points, and inspection intervals and methods. WFD ALIs may take the form of inspections, modifications, or replacements of WFD-susceptible structure. The WFD ALI maintenance actions would be performed on airplane structure, including structure that has been repaired, altered or modified to support the extended operational limit. Any future proposed revisions to any of these ALIs would need to be submitted to the FAA oversight office through the Principal Maintenance Inspector (PMI) for approval.

The applicable incorporated guidelines would provide a means for operators to identify and evaluate repairs, alterations, and modifications susceptible to WFD that have been installed on transport category airplanes operating under an extended operational limit. The only repairs, alterations or modifications needing a WFD evaluation would be those identified in the applicable guidelines and would not include TC holder's repairs identified according to § 25.1807(g)(1).

The fatigue life on those repairs would generally be greater than the period of time the airplane has to go from its initial operational limit to its extended operational limit. For example, if a repair that has been identified in the TC holders structural repair manual has been evaluated to support an initial operational limit stated as 60,000 flight cycles, then that repair would generally be valid up to 60,000 flight cycles. If that repair is installed after an airplane is approved for an extended operational limit, the repair would generally be valid up to 60,000 flight cycles after installation. If we assume an extended operational limit of 75,000 total accumulated flight cycles for this example, and the airplane had 61,000 total accumulated flight cycles, the subject repair would generally be valid for the 14,000 flight cycles remaining under the extended operational limit.

The applicable guidelines would also provide a methodology for developing service information to support the extended operational limit. This service information would consist of maintenance actions that may include inspection, modification, or replacement of the repair, alteration, or modification. Operators would be required to perform a WFD evaluation of these repairs, alterations, or modifications using the applicable guidelines. If the evaluation concludes that WFD is likely to occur before the extended operational limit, the operator would need to develop any necessary maintenance actions according to § 25.1813.

The evaluation and proposed maintenance action would be submitted to the FAA oversight office through the operator's PMI for approval. This submittal process keeps PMIs informed and gives them the opportunity to provide comments on the repair, alteration, or modification to the operator and FAA oversight office.

Operators would be required to evaluate any repair, alteration, or modification installed on the airplane after approval of an extended operational limit. The operator would use the guidelines developed according to the proposed § 25.1807 and incorporated under the proposed operating rule. Operators would be required to complete the evaluation and identify any necessary additional maintenance actions, if applicable, within 90 days after returning an airplane to service. The operator would have 90 days after approval by the FAA oversight office to revise its maintenance program to incorporate any approved ALIs. This time period allows

for completion of the WFD evaluation and incorporation of any necessary maintenance actions into an operator's maintenance program. The airplane should not be at risk of structural failure due to WFD within the prescribed time period because WFD is a long-term fatigue problem.

As with other maintenance actions, before returning an airplane to service, operators would be required under existing regulations to ensure that the repair, alteration, or modification meets immediate and short-term strength requirements, such as the ultimate static strength requirements specified in part 25. There may be other actions and approvals associated with returning the affected airplane to service. Those actions and approvals would still apply as before.

Required maintenance program revisions would need to be submitted to the operator's PMI for review and approval. We are in the process of developing guidance for PMIs to ensure that their reviews are consistent and focused on the key implementation issues.

**V. Additional Provisions**

*A. Relationship of This Proposal to Aging Airplane Regulatory Initiatives*

As part of our broader review of several important initiatives comprising the Aging Airplane Program, we have revised certain compliance dates in existing rules and pending proposals so that operators can make required modifications during scheduled maintenance. Changing compliance dates affects our ability to expedite some aspects of this program but reduces the costs of the rules and proposals in place to deal with aging airplanes. Notice of these changes and a description of our Aging Airplane Program review appeared in the **Federal Register** on July 30, 2004 (69 FR 45936). In addition to this Widespread Fatigue Damage proposal, the actions affected by these revisions include:

- Fuel Tank Flammability Reduction (proposal),
- Aging Airplane Safety (interim final rule), and
- Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety (proposal).

*B. FAA Advisory Material*

To help those persons affected by this proposed rule better understand what is necessary to show compliance with these proposed requirements, we are developing guidance material to supplement the proposed rule. We are revising AC 25.571-1C and proposing a

new AC to include guidelines for the development of operational limits; service information for maintenance actions; and service information and guidelines for identifying and evaluating repairs, alterations, and modifications.

We incorporated, in part, the ARAC recommendation to revise AC 25.571-1C by including a definition for an initial operational limit; guidance for incorporation of the initial operational limit into the Airworthiness Limitations section; and guidance for providing evidence for demonstrating through full-scale fatigue testing that WFD will not occur before the initial operational limit.

We also incorporated, in part, the ARAC recommendations to revise AC 91-56, "Continuing Structural Integrity Program for Large Transport Category Airplanes." AC 91-56A, which was issued on April 29, 1998, added Appendix 2, "Guidelines for the Development of a Program to Predict and Eliminate Widespread Fatigue Damage."

We are developing a new AC based, in part, on the ARAC recommendation to provide guidance for type certificate holders and others to perform WFD evaluations. The proposed AC includes:

- Guidelines for conducting a structural WFD evaluation.
- Illustrations of the structure susceptible to MSD and MED. These illustrations are by no means exhaustive and are included to stimulate the review of all possible affected structure.
- Guidance on developing a WFD prediction and verification technique.
- Evaluation of maintenance actions.
- Details of the documentation required by the FAA.
- Examples of structural repairs, alterations, and modifications.

This AC would also provide guidance for operators of affected airplanes on how to incorporate an FAA-approved ALS with an initial operational limit into their FAA-approved maintenance program; incorporate an extended operational limit and any applicable ALI to preclude WFD; and incorporate any new ALI developed as a result of evaluations to address repairs, alterations, and modifications installed after incorporation of an extended operational limit.

We invite public comments on the proposed ACs by separate notice, which will be published in the **Federal Register**.

*C. FAA Oversight Office*

We are also requiring affected persons to submit various compliance materials related to WFD to the FAA Oversight

Office, defined in proposed § 25.1801(b). The FAA Oversight Office is the aircraft certification office or office within the Transport Airplane Directorate having oversight responsibility for the relevant TC or STC, as delegated by the Administrator. In other contexts, we have described the FAA office performing these functions as the "cognizant FAA office."

Table 4 lists the FAA offices that currently oversee issuance of TCs and amended TCs for manufacturers of transport category airplanes.

**TABLE 4.—FAA OFFICES THAT OVERSEE TYPE CERTIFICATES**

Airplane manufacturer	FAA oversight office
Aerospatiale .....	Transport Airplane Directorate, International Branch, ANM-116.
Airbus .....	Transport Airplane Directorate, International Branch, ANM-116.
BAE .....	Transport Airplane Directorate, International Branch, ANM-116.
Boeing .....	Seattle Aircraft Certification Office.
Bombardier .....	New York Aircraft Certification Office.
deHaviland .....	New York Aircraft Certification Office.
Embraer .....	Transport Airplane Directorate, International Branch, ANM-116.
Fokker .....	Transport Airplane Directorate, International Branch, ANM-116.
Gulfstream .....	Atlanta Aircraft Certification Office.
Lockheed .....	Atlanta Aircraft Certification Office.
McDonnell-Douglas.	Los Angeles Aircraft Certification Office.

*D. Need for Training*

The FAA recognizes that implementation of the proposed rule will be more complex than any other aging airplane program. We consider it essential that affected persons receive training to carry out the required actions. These persons include FAA PIs, Aviation Safety Inspectors, and ACO engineers, designees, operators, and maintenance personnel. We are developing training material based, in part, on the ARAC recommendations incorporated into this proposal and other considerations.

This training would include, but is not limited to public meetings, FAA-only seminars, formal FAA and industry training sessions, and industry workshops to enhance communication among industry, operators, and the

FAA. The FAA requests comments on this aspect of the proposed rule.

**VI. Rulemaking Notices and Analyses**

*Authority for This Rulemaking*

The FAA's authority to issue rules regarding aviation safety is found in Title 49 of the United States Code. Subtitle I, Section 106 describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency's authority.

This rulemaking is promulgated under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, "General requirements." Under that section, the FAA is charged with promoting safe flight of civil aircraft in air commerce by prescribing

- Minimum standards required in the interest of safety for the design and performance of aircraft;
  - Regulations and minimum standards in the interest of safety for inspecting, servicing, and overhauling aircraft; and
  - Regulations for other practices, methods, and procedures the Administrator finds necessary for safety in air commerce.
- This regulation is within the scope of that authority because it prescribes—
- New safety standards for the design of transport category airplanes, and
  - New requirements necessary for safety for the design, production, operation, and maintenance of those airplanes, and for other practices, methods and procedures relating to those airplanes.

*Paperwork Reduction Act*

This proposal contains the following new information collection requirements. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the Department of Transportation has sent the information requirements associated with this proposal to the Office of Management and Budget for its review.

*Title:* Widespread Fatigue Damage.

*Summary:* This proposal consists of regulatory changes pertaining to

widespread fatigue damage in transport category airplanes. Some of these changes would require new information collection. The proposed new information requirements and the persons who would be required to provide that information are described below.

(1) Proposed subpart I would require that existing design approval holders establish initial operational limits for transport category airplanes. Those persons would also be required to revise the Airworthiness Limitation section of the Instructions for Continued Airworthiness (ICA) to include an initial operational limit. This requirement would be necessary to ensure that the affected airplanes are evaluated for WFD and that an initial operational limit is established beyond which an airplane cannot be operated. By establishing this limit it would be assured that WFD, which would adversely affect safety, would be precluded in the airplane.

(2) Proposed subpart I would also require that design approval holders submit to the FAA a plan detailing how they intend to comply with the new requirements. The FAA would use this information to assist the design approval holder in complying with the new requirements. The compliance plan would be necessary to ensure that the design approval holders fully understand the requirements, correct any deficiencies in planning in a timely manner, and are able to provide the information needed by the operators for timely compliance with the rule.

(3) TC holders would be required to develop guidelines for addressing repairs, alterations, and modifications susceptible to MSD or MED. These guidelines would be used to identify and evaluate repairs, alterations, and modifications that may be installed on an affected airplane. This requirement is needed because TC holders have the data necessary to inform others of areas of the airplane that may be susceptible to WFD when repaired, altered, or modified.

(4) TC and STC holders would be required to develop service information

to address repairs and modifications that would be susceptible to WFD before the airplane reaches the initial operational limit. Because this susceptibility is an unsafe condition, this service information would be mandated by airworthiness directive (AD) to support a proposed initial operational limit.

(5) Anyone operating an airplane under parts 121 and 129 would be required to revise their maintenance program to incorporate an ALS that includes an initial operational limit. Operators would be prohibited from operating an airplane past the initial operational limit.

(6) As an option, any person may apply for an extended operational limit for affected airplanes. This option would have requirements similar to those imposed on TC holders for establishing an initial operational limit. In addition, repairs, alterations, or modifications installed on an airplane with an extended operational limit would require identification and evaluation under § 25.1807(g). There may be service information developed that would support the extended limit and would be documented as airworthiness limitation items (ALIs). To operate beyond the initial operational limit, an operator would have to incorporate the extended limit and any WFD ALI into its maintenance program.

*Use of:* This proposal would support the information needs of the FAA in approving design approval holder and operator compliance with the proposed rule.

*Average Annual Burden Estimate:* The burden would consist of the work necessary to:

- Develop the revision to the existing ICA information
- Develop the compliance plan
- Incorporate the new information into the existing maintenance program

This proposed rulemaking would result in an annual recordkeeping and reporting burden as follows:

Documents required to show compliance with the proposed rule	Average annual hours	Present value discounted cost (\$2,000)
FAA-approved revised or new ALS .....	132	8,606
FAA-approved WFD compliance plan .....	436	16,759
FAA-approved guidelines for repairs, alterations, and modifications .....	894	63,542
FAA-approved service information for repairs and modifications relative to initial operational limit .....	276	16,288
FAA-approved maintenance program revision for operators .....	29	4,340
FAA-approved program for extended operational limit (if applicable) .....	132	8,606
<b>Total .....</b>	<b>1,899</b>	<b>\$118,141</b>

The FAA computed the annual recordkeeping (total hours) burden by analyzing the necessary paperwork requirements needed to satisfy each process of the proposed rulemaking. The average cost per hour varies due to the number of affected airplanes in each group, the amount of engineering time required to develop programs, and the amount of time required for each inspection.

The agency is seeking comments to—

- Evaluate whether the proposed information requirement is necessary for the proper performance of the roles of the agency, including whether the information will have practical utility;
- Evaluate the accuracy of the agency's estimate of the burden;
- Improve the quality, utility, and clarity of the information to be collected; and
- Minimize the burden of the collection of information on those who are to respond using appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology.

Individuals and organizations may submit comments to the FAA on the information collection requirement by July 17, 2006. You should send your comments to the address listed in the **ADDRESSES** section of this document.

Under the Paperwork Reduction Act of 1995, (5 CFR 1320.8(b)(2)(vi)), an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control number for this information collection will be published in the **Federal Register**, after the Office of Management and Budget approves it.

#### *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 there are no ICAO Standards and Recommended Practices that correspond to these proposed regulations.

#### **VII. Regulatory Evaluation, Regulatory Flexibility Determination, International Trade Impact Assessment, and Unfunded Mandates Assessment**

This portion of the preamble summarizes the FAA's analysis of the economic impacts of this NPRM. It also includes summaries of the initial regulatory flexibility determination. We

suggest readers seeking greater detail read the full regulatory evaluation, a copy of which we have placed in the docket for this rulemaking.

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 Agreements Act (19 U.S.C. 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, to be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of \$100 million or more annually (adjusted for inflation).

In conducting these analyses, the FAA has determined this proposed rule: (1) Has benefits that justify its costs, is a “significant regulatory action” as defined in section 3(f) of Executive Order 12866, and is “significant” as defined in DOT's Regulatory Policies and Procedures; (2) will have a significant economic impact on a substantial number of small entities; (3) will not reduce barriers to international trade; and 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.

#### *Total Costs and Benefits of This Rulemaking*

The proposed rule is based, in part, on recommendations from the Aviation Rulemaking Advisory Committee (ARAC). Early in 2001, the FAA performed an extensive cost-benefit analysis of the ARAC proposal based on the data then available. Since then the proposed rule has been modified and more recent data has become available. The FAA updated the 2001 analysis to reflect changes in the proposed rule relative to the ARAC proposal. The FAA believes the analysis, as updated, properly reflects the cost and benefit determination. The FAA will further update the analysis, incorporating the

latest data and information obtained from the NPRM, for the final rule. The costs of this proposal are the costs of the development of Widespread Fatigue Damage (WFD) programs by the airplane manufacturers and the incorporation of the WFD programs into the maintenance procedures of the airplane operators plus the inspection and structural modifications that may be required of the airplane operators. It is estimated that the total 20-year present value cost of this proposal is about \$360 million. The benefits of this proposal consist of accident prevention and the prevention of unscheduled maintenance/downtime of fleets of aircraft. The present value benefits of this proposal, over 20 years, are estimated to be about \$809 million.

#### *Who Is Potentially Affected by This Rulemaking?*

- Manufacturers of large transport category part 25 airplanes (airplanes with a maximum gross takeoff weight greater than 75,000 pounds).
- Applicants for type certificates or supplemental type certificates after the effective date of the rule for all transport category part 25 airplanes.
- Supplemental type certificate holders and applicants for amended part 25 type certificates.
- U.S. certificate holders and foreign air carriers and foreign persons operating U.S.-registered large transport category part 25 airplanes under 14 CFR parts 121 or 129.

#### *Our Cost Assumptions and Sources of Information*

- Discount rate—7%
- Period of analysis—20 years, 2001 through 2020
- Value of fatality averted—\$3.0 million (Source: U.S. Department of Transportation, *Treatment of Value of Life and Injuries in Preparing Economic Evaluations*, January 19, 2002)
- Aircraft Values = Aviation Specialists Group (ASG)
- Aircraft Operational Data = Aircraft Analytical System (ACAS) Database
- Aircraft Accident Data = NTSB Database
- Aircraft Forecasts = Boeing
- Unit Cost of WFD Inspections = Airworthiness Assurance Working Group (AAWG)

In the design and certification process of an airplane, a type certificate applicant generally establishes an expected economic life for the airplane, known as a design service goal (DSG). For certain airplanes, design approval holders have performed additional fatigue tests, teardown inspections, and analyses to support changing DSG to extended service goals (ESG).



For purposes of the cost/benefit analysis in this evaluation, we used the existing service goal for an airplane (whether the service goal is a (DSG or ESG) as an analytical starting point for the initial operational limits (IOLs). The existing service goals are listed in Table 3. We have assumed that additional costs of compliance will be incurred at 100% and potentially again at 125% of this service goal. We note that Boeing plans to establish IOLs that would be 130 to 150 percent of the DSG or ESG for their airplanes. Since this action would support an IOL that could be substantially higher than the estimates used for a particular airplane, the costs of inspection and modification could exceed our estimates, while the costs of early retirement of useful airplanes could be less. Manufacturers of aircraft no longer in production, and with only a few airplanes in operation, are likely not to extend the current service goal.

The FAA seeks comments on these assumptions, and future plans to extend DSG or ESG and the establishment of initial operational limits.

#### *Alternatives We Considered*

The FAA considered five alternatives to the proposed rule. These were:

1. Exclude small entities.
2. Extend the compliance deadline for small entities.
3. Establish lesser technical requirements for small entities.
4. Expand the requirements to cover more airplanes.
5. Retire airplanes at the manufacturer's design or extended service goal.

The FAA concluded that Alternative 1, the option to exclude small entities from all the requirements of the proposed rule, was not justified. The purpose of the proposed rule is to maintain the airworthy operating condition of airplanes regardless of secondary considerations.

The FAA also considered options that would lengthen the compliance period for small operators (Alternative 2). The FAA believes time extensions only provide modest cost savings and leave the system safety at risk.

The FAA considered establishing lesser technical requirements for small entities (Alternative 3). However, the FAA believes the risks are similarly unreasonable for small entities operating airplanes susceptible to WFD, and that the benefits of including small entities justify the cost.

The FAA considered requiring all operators of existing transport category airplanes to comply with the proposed rule (Alternative 4). Over the past several years, TC holders have been

addressing issues with aging airplane programs for airplanes with maximum takeoff gross weights greater than 75,000 pounds. Because of this, the FAA decided to restrict compliance to operators of those airplanes.

The FAA considered mandating the retirement of airplanes at an initial operating limit equivalent to the manufacturer's current service goal (DSG or ESG). This alternative would not allow a DAH to establish a higher initial operation limit based on identifying additional maintenance actions (inspections, modifications, or replacements) that would preclude WFD up to this higher limit.

Such a requirement would result in the removal of about 600 U.S. transport category airplanes at a cost of \$7.6 billion or a present value of \$3.4 billion. The FAA believes this alternative would present a substantial burden on industry and adversely affected the wide body cargo market. The *Sensitivity Studies* section of the full regulatory evaluation explores this option in more detail.

The FAA concludes the current proposal is the preferred alternative because it has benefits exceeding compliance costs and allows for continued operation of airplanes up to the point where maintenance actions can no longer ensure that the airplanes are free from widespread fatigue damage.

#### *Comments Requested*

We requested industry comment, with quantifiable support, for important assumptions made in the regulatory analysis. These comments are summarized below.

- We request manufacturers to identify, by airplane model, anticipated initial operational limits and if they plan to establish an initial operational limit for an airplane model that is higher than the existing service goal shown in Appendix 2 of this document.
- We request that operators identify airplane models that they desire to operate beyond the service goal identified in Appendix 2 of this document.
- We request comment on the future operational costs that this proposal will add for newly type certificated airplanes.
- We request comment from industry on any new technological WFD inspection methods, including costs per individual airplane models.
- We request comments on operators' practice of retiring airplanes beyond the service goal identified in Appendix 2 and the costs to operators of retiring and replacing airplanes at the service goal if the initial operational limit for the

airplane is at the service goal for that airplane.

- We request comment on the number of components, by airplane model, likely to be affected by WFD-related problems. The greatest uncertainty with respect to the costs of compliance with the rule relates to the number of components for a fuselage type likely to be affected by WFD-related problems at or above 100% DSG or ESG.

#### *Benefits of This Rulemaking*

The present value benefits of this proposal consist of \$726 million of accident prevention benefits and \$83 million of detection benefits for total present value benefits of \$809 million. The detection benefits are the benefits resulting from averted accidents and a reduction in unscheduled maintenance and repairs that would result from this proposal.

#### *Costs of This Rulemaking*

The costs of this proposal are those costs incurred by the airplane manufacturers for developing WFD programs, the airplane operators who incur the costs of inspection, aircraft retirement, and modifications to the airplanes, plus the costs incurred by the FAA.

The attributable costs of the rule do not include the expense of making repairs to structure that has been found to be cracked during any inspections resulting from the proposed rule. When any inspection procedure identifies a condition that renders the aircraft unairworthy, current FAA regulations<sup>8</sup> mandate actions to restore the aircraft to an airworthy condition.

To the extent that the repairs would already be required and already be performed under existing regulations, because of an operator's continuing responsibility to maintain the airworthiness of the aircraft, this assumption may overstate the net additional benefits from this rulemaking. This rulemaking is intended to ensure that problems are identified more rapidly, but the FAA assumes that all WFD problems will ultimately be discovered. The FAA and operators might identify WFD issues through other inspections or because of an accident in a similar aircraft, and therefore operators will have to make the repairs at some point. Accordingly, we request commenters to address the appropriate allocation of additional benefits, including, specifically, the nature and timing of repairs that would

<sup>8</sup> Sections 43.13, 91.7(a), 121.153(a)(2), and 129.14.

be undertaken as a result of this rulemaking.

The present value cost of this proposal, estimated over the 20-year study period, is about \$360 million.

Under the proposal endorsed by the ARAC in 2001, the responsibility for developing inspection and modification procedures and for putting them into practice was to be borne by airplane operators. The costs of the rule were estimated under that assumption. We now estimate that the airplane manufacturers would incur approximately 10 percent and operators would incur approximately 90 percent of these costs. The total costs remain unchanged, however. We believe it is possible that the manufacturers' assumption of responsibility for testing and development would discover areas where WFD is likely to emerge and may reduce the need for preventive inspection and maintenance in other areas. The FAA is working with industry to develop compliance procedures and welcomes any additional information on the assumptions we made in these cost estimates.

#### *Regulatory Flexibility Determination*

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 RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The RFA 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, the agency must prepare a regulatory flexibility analysis, as described in the RFA.

The FAA conducted a complete regulatory flexibility analysis to assess the impact on small entities and discussed in detail following this initial regulatory evaluation. This rule would affect operators of airplanes, in the specified parts of the CFR. For operators, a small entity is defined as

one with 1,500 or fewer employees.<sup>9</sup> As there are operators that met those criteria for a small business, the FAA conducted a small business economic impact assessment to determine if the rule would have a significant impact on a substantial number of these operators. As a result of the small business economic impact assessment the FAA believes that this proposal would result in a significant economic impact on a substantial number of small entities. A complete discussion is contained in the full regulatory evaluation filed separately in the docket.

#### *Unfunded Mandates Assessment*

Title II of the Act requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of \$100 million or more (adjusted annually for inflation) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a “significant regulatory action.” The FAA currently uses an inflation-adjusted value of \$120.7 million in lieu of \$100 million. This proposed rule does not contain such a mandate. The requirements of Title II of the Act therefore do not apply.

#### *Executive Order 13132, Federalism*

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

#### *Regulations Affecting Intrastate Aviation in Alaska*

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator, when modifying regulations in Title 14 of the CFR 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 to establish such regulatory distinctions as he or she considers appropriate. Because this proposed rule would apply to airplanes operated under parts 121 and 129, it could, if adopted, affect intrastate

aviation in Alaska. The FAA, therefore, specifically requests comments on whether there is justification for applying the proposed rule differently to intrastate operations in Alaska.

#### *Plain English*

Executive Order 12866 (58 FR 51735, October 4, 1993) requires each agency to write regulations that are simple and easy to understand. We invite your comments on how to make these proposed regulations easier to understand, including answers to questions such as the following:

- Are the requirements in the proposed regulations clearly stated?
- Do the proposed regulations contain unnecessary technical language or jargon that interferes with their clarity?
- Would the regulations be easier to understand if they were divided into more (but shorter) sections?
- Is the description in the preamble helpful in understanding the proposed regulations?

Please send your comments to the address specified in the **ADDRESSES** section.

#### *Environmental Analysis*

FAA Order 1050.1E identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act (NEPA) in the absence of extraordinary circumstances. The FAA has determined this proposed rulemaking action qualifies for the categorical exclusion identified in paragraph 312f and involves no extraordinary circumstances.

#### *Regulations That Significantly Affect Energy Supply, Distribution, or Use*

The FAA has analyzed this NPRM under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). We have determined that it is not a “significant energy action” under the executive order because it is not a “significant regulatory action” under Executive Order 12866, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

#### **VIII. The Proposed Amendments**

In consideration of the foregoing, the Federal Aviation Administration proposes to amend Chapter 1 of Title 14, Code of Federal Regulations, parts 25, 121, and 129, as follows:

<sup>9</sup> 13 CFR Part 121.201, Size Standards Used to Define Small Business Concerns, Sector 48–49 Transportation, Subsector 481 Air Transportation.

List of Subjects

14 CFR Part 25

Aircraft, Aviation safety, 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.

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

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

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

2. Amend § 25.1 by adding new paragraphs (c) and (d) to read as follows:

§ 25.1 Applicability.

\* \* \* \* \*

(c) This part also establishes requirements for holders of type certificates and changes to those certificates to take actions necessary to support the continued airworthiness of transport category airplanes.

(d) This part also establishes requirements for persons seeking approval for airplane repairs, alterations, or modifications.

3. Amend § 25.2 by adding a new paragraph (d) to read as follows:

§ 25.2 Special retroactive requirements.

\* \* \* \* \*

(d) In addition to the requirements of this section, subpart I of this part contains requirements that apply to—

(1) Holders of type certificates and supplemental type certificates;

(2) Applicants for type certificates, amendments to type certificates (including service bulletins describing design changes), and supplemental type certificates; and

(3) Persons seeking approval for airplane repairs, alterations, or modifications.

4. Amend § 25.571 by revising paragraphs (a)(3) introductory text and (b) introductory text to read as follows:

§ 25.571 Damage-tolerance and fatigue evaluation of structure.

(a) \* \* \*

(3) Based on the evaluations required by this section, inspections or other procedures must be established, as necessary, to prevent catastrophic failure, and must be included in the Airworthiness Limitations section (ALS)

of the Instructions for Continued Airworthiness required by § 25.1529. The initial operational limit, stated as a number of total accumulated flight cycles or flight hours, established by this section must also be included in the ALS of the Instructions for Continued Airworthiness required by § 25.1529. Inspection thresholds for the following types of structure must be established based on crack growth analyses and/or tests, assuming the structure contains an initial flaw of the maximum probable size that could exist as a result of manufacturing or service-induced damage:

\* \* \* \* \*

(b) Damage-tolerance and widespread fatigue damage evaluation. The evaluation must include a

determination of the probable locations and modes of damage due to fatigue, corrosion, or accidental damage. Repeated load and static analyses supported by test evidence and (if available) service experience must also be incorporated in the evaluation. Special consideration for widespread fatigue damage must be included where the design is such that this type of damage could occur. An initial operational limit must be established that corresponds to the period of time, stated as a number of total accumulated flight cycles or flight hours, during which it is demonstrated that widespread fatigue damage will not occur in the airplane structure. This demonstration must be by full-scale fatigue test evidence. The type certificate may be issued prior to completion of full-scale fatigue testing, provided the Administrator has approved a plan for completing the required tests, and the Airworthiness Limitations section of the Instructions for Continued Airworthiness required by § 25.1529 of this part specifies that no airplane may be operated beyond a number of cycles equal to 1/2 the number of cycles accumulated on the fatigue test article, until such testing is completed. The extent of damage for residual strength evaluation at any time within the operational life of the airplane must be consistent with the initial detectability and subsequent growth under repeated loads. The residual strength evaluation must show that the remaining structure is able to withstand loads (considered as static ultimate loads) corresponding to the following conditions:

\* \* \* \* \*

5. Amend part 25 by adding a new subpart I to read as follows:

Subpart I—Continued Airworthiness and Safety Improvements

Sec.

General

- 25.1801 Purpose and definition.
25.1803 [Reserved]
25.1805 [Reserved]

Widespread Fatigue Damage

- 25.1807 Initial operational limit: Widespread Fatigue Damage (WFD).
25.1809 Changes to type certificates: Widespread Fatigue Damage (WFD).
25.1811 Extended operational limit: Widespread Fatigue Damage (WFD).
25.1813 Repairs, alterations, and modifications: Widespread Fatigue Damage (WFD).

Subpart I—Continued Airworthiness and Safety Improvements

General

§ 25.1801 Purpose and definition.

(a) This subpart establishes requirements for support of the continued airworthiness of transport category airplanes. These requirements may include performing assessments, developing design changes, developing revisions to Instructions for Continued Airworthiness, and making necessary documentation available to affected persons. This subpart applies to the following persons, as specified in each section of this subpart:

- (1) Holders of type certificates and supplemental type certificates.
(2) Applicants for type certificates and changes to type certificates (including service bulletins describing design changes). Applicants for changes to type certificates must comply with the requirements of this subpart in addition to the airworthiness requirements determined applicable under § 21.101 of this subchapter.

(3) Persons seeking approval for airplane repairs, alterations, or modifications that may affect airworthiness.

(b) For purposes of this subpart, the "FAA Oversight Office" is the aircraft certification office or office of the Transport Airplane Directorate with oversight responsibility for the relevant type certificate or supplemental type certificate, as determined by the Administrator.

§ 25.1803 [Reserved]

§ 25.1805 [Reserved]

Widespread Fatigue Damage

§ 25.1807 Initial operational limit: Widespread Fatigue Damage (WFD).

(a) Applicability. Except as provided in paragraph (i) of this section, this

section applies to transport category airplanes with maximum takeoff gross weights greater than 75,000 pounds as approved during the original type certification of the airplane. It also applies to those airplanes certified with maximum takeoff gross weights of 75,000 pounds or less, and later increased to greater than 75,000 pounds by an amended type certificate or supplemental type certificate. These airplanes are referred to in this section as large transport category airplanes.

(b) *Initial operational limit.* To preclude WFD from occurring in the large transport category airplane fleet, each person identified in paragraph (c) of this section must comply with the following requirements:

(1) Perform an evaluation of airplane structural configurations to determine when WFD is likely to occur for structure susceptible to multiple site damage (MSD) or multiple element damage (MED). The airplane structural configurations to be evaluated consist of—

(i) All model variations and derivatives approved under the type certificate; and

(ii) All structural modifications and replacements, to the airplane structural configurations specified in paragraph (b)(1)(i), mandated by airworthiness directives as of [effective date of the final rule].

(2) Using the results from the evaluation performed in paragraph (b)(1) of this section, establish an initial operational limit, stated as a total number of accumulated flight cycles or flight hours.

(3) If the initial operational limit depends on performance of maintenance actions for which service information has not been mandated by airworthiness directive as of [effective date of the final rule], submit the following to the FAA Oversight Office:

(i) For those maintenance actions for which service information has been issued as of the applicable compliance date specified in paragraph (c) of this section, a list identifying each of those actions.

(ii) For those maintenance actions for which service information has not been issued as of the applicable compliance date specified in paragraph (c) of this section, a list identifying each of those actions and a binding schedule for providing in a timely manner the necessary service information for those actions. Once the FAA Oversight Office approves this schedule, you must comply with that schedule.

(4) Unless previously accomplished, establish an Airworthiness Limitations section (ALS) for each airplane

structural configuration evaluated under paragraph (b)(1) and submit it to the FAA Oversight Office for approval. The ALS must include a section titled Widespread Fatigue Damage (WFD) that incorporates the applicable initial operational limit established under paragraph (b)(2) of this section.

(c) *Compliance dates for establishing the initial operational limit.* The following persons must comply with the requirements of paragraph (b) of this section by the specified date.

(1) Holders of type certificates (TC): no later than December 18, 2007.

(2) Applicants for TCs, if the date of application was before [effective date of the final rule]: no later than December 18, 2007, or the date the certificate is issued, whichever occurs later.

(3) Holders of either supplemental type certificates (STCs) or amendments to TCs that increase maximum takeoff gross weights from 75,000 pounds or less, to greater than 75,000 pounds: no later than December 18, 2007.

(4) Applicants for either STCs or amendments to TCs that increase maximum takeoff gross weights from 75,000 pounds or less, to greater than 75,000 pounds: no later than December 18, 2007, or the date the certificate is issued, whichever occurs later.

(d) *Compliance plan.* Each person identified in paragraph (e) of this section must submit a compliance plan consisting of the following:

(1) A proposed project schedule, identifying all major milestones, for meeting the compliance dates specified in paragraphs (c) and (h) of this section.

(2) A proposed means of compliance with paragraphs (b)(1) through (b)(4) of this section.

(3) If the proposed means of compliance differs from that described in FAA advisory material, a detailed explanation of how the proposed means will be shown to comply with this section.

(4) A proposal for submitting a draft of all compliance items required by paragraphs (b) and (g) of this section for review by the FAA Oversight Office not less than 60 days before the compliance date specified in paragraph (c) or (h) of this section, as applicable.

(5) A proposal for addressing repairs, alterations, and modifications as required by paragraph (g) of this section.

(6) A proposed process for continuously assessing service information related to WFD.

(7) A proposal for how the initial operational limit will be distributed.

(e) *Compliance dates for compliance plans.* The following persons must submit the compliance plan described in paragraph (d) of this section to the

FAA Oversight Office by the specified date.

(1) Holders of type certificates (TC): no later than March 18, 2007.

(2) Applicants for TCs, if the date of application was before [effective date of the final rule]: no later than March 18, 2007.

(3) Holders of either supplemental type certificates (STC) or amendments to TCs that increase maximum takeoff gross weights from 75,000 pounds or less, to greater than 75,000 pounds: no later than March 18, 2007.

(4) Applicants for either STCs or amendments to TCs that increase maximum takeoff gross weights from 75,000 pounds or less, to greater than 75,000 pounds, if the date of application was before [effective date of the final rule]: no later than March 18, 2007.

(5) Applicants for either STCs or amendments to TCs that increase maximum takeoff gross weights from 75,000 pounds or less, to greater than 75,000 pounds, if the date of application was after [effective date of the final rule]: no later than March 18, 2007, or within 90 days after the date of application, whichever occurs later.

(f) *Compliance plan deficiencies.* Each affected person must implement the compliance plan as approved in compliance with paragraph (d) of this section. If either paragraph (f)(1) or (2) of this section applies, the affected person must submit a corrected plan to the FAA Oversight Office and implement the corrected plan within 30 days after such notification.

(1) The FAA Oversight Office notifies the affected person of deficiencies in the proposed compliance plan and how to correct them.

(2) The FAA Oversight Office notifies the affected person of deficiencies in the person's implementation of the plan and how to correct them.

(g) *Widespread fatigue damage service information and guidelines.* Each person identified in paragraph (h) of this section must submit the following to the FAA Oversight Office for approval—

(1) An identification of repairs and modifications described in structural repair manuals, service bulletins, and other service information and design approvals developed by the person, that may be susceptible to WFD along with an evaluation to determine when WFD is likely to occur in affected structure susceptible to multiple site damage or multiple element damage;

(2) Service information for maintenance actions that must be performed to preclude WFD from occurring before the airplane reaches the established initial operational limit, if the evaluation required by paragraph

(g)(1) of this section concludes that WFD is likely to occur before the initial operational limit established under paragraph (b) of this section; and

(3) Guidelines for—

(i) Identifying repairs, alterations, and modifications, other than those specified in paragraph (g)(1) of this section, that may be susceptible to WFD;

(ii) Evaluating repairs, alterations, and modifications identified in paragraph (g)(3)(i) of this section to determine when WFD is likely to occur in affected structure; and

(iii) Developing service information for maintenance actions that must be performed to preclude WFD for those repairs, alterations, and modifications identified in paragraph (g)(3)(i) of this section.

(4) Once approved by the FAA Oversight Office, the documents required by this paragraph must be made available to owners and operators of affected airplanes subject to this section and to affected persons subject to § 25.1809 of this subpart.

(h) *Compliance dates for establishing the service information and guidelines.* The following persons must comply with the requirements of paragraph (g) of this section by the specified date.

(1) Holders of type certificates (TC): no later than December 18, 2009.

(2) Applicants for TCs, if the date of application was before [effective date of the final rule]: no later than December 18, 2009, or the date the certificate is issued, whichever occurs later.

(3) Applicants for amendments to TCs that increase maximum takeoff gross weights from 75,000 pounds or less, to greater than 75,000 pounds: no later than December 18, 2009, or the date the certificate is issued, whichever occurs later.

(i) This section does not apply to the following airplane models:

(1) Bombardier BD-700

(2) Gulfstream G-V

(3) Gulfstream G-VSP

(4) British Aerospace, Aircraft Group and Societe Nationale Industrielle Aerospatiale Concorde Type 1

**§ 25.1809 Changes to type certificates: Widespread Fatigue Damage (WFD).**

(a) *Applicability.* Except as stated in paragraph (b) of this section, this section applies to supplemental type certificates (STCs) and amendments to type certificates (ATC)—

(1) For transport category airplanes for which initial operational limits are established under § 25.1807 of this subpart; and

(2) That are identified using the guidelines developed according to § 25.1807(g)(3) of this subpart.

(b) This section does not apply to STCs or ATCs covered by § 25.1807(c)(3) or (4) of this subpart.

(c) *WFD Evaluation.* Each person identified in paragraph (d) of this section must do the following:

(1) Perform an evaluation to determine if any new structure or any structure affected by the change is susceptible to WFD and, if so, when WFD is likely to occur. This evaluation must be performed using:

(i) Guidelines specified in § 25.1807(g)(3)(i) and (ii) of this subpart; or

(ii) Guidelines approved by the FAA Oversight Office.

(2) If the evaluation required by paragraph (c)(1) of this section concludes that WFD is likely to occur before the initial operational limit, develop the maintenance actions that must be performed to preclude WFD from occurring before the airplane reaches the established initial operational limit. These maintenance actions must be developed using:

(i) Guidelines specified in § 25.1807(g)(3)(iii) of this subpart; or

(ii) Guidelines approved by the FAA Oversight Office.

(3) Submit to the FAA Oversight Office for approval the maintenance actions required by paragraph (c)(2) of this section. Once approved, service information for those actions must be made available to owners and operators of affected airplanes subject to this section.

(d) *Compliance dates for evaluating changes to type certificates.* The following persons must comply with the requirements of paragraph (c) of this section by the dates specified.

(1) Holders of STCs: No later than December 18, 2010.

(2) Applicants for STCs or for amendments to TCs: no later than December 18, 2010, or the date the certificate is issued, whichever occurs later.

(e) *Compliance plan.* Each person identified in paragraph (f) of this section must submit a compliance plan consisting of the following:

(1) A proposed project schedule, identifying all major milestones, for meeting the compliance dates specified in paragraph (d) of this section.

(2) A proposed means of compliance with paragraphs (c)(1) through (c)(3) of this section.

(3) If the proposed means of compliance differs from that described in FAA advisory material, a detailed explanation of how the proposed means will be shown to comply with this section.

(4) A proposal for submitting a draft of all compliance items required by

paragraph (b) of this section, as applicable, for review by the FAA Oversight Office not less than 60 days before the compliance dates specified in paragraph (d) of this section, as applicable.

(5) A proposed process for continuously assessing service information related to WFD.

(6) A proposal for how the approved service information will be distributed.

(f) *Compliance dates for compliance plans.* The following persons must submit the compliance plan described in paragraph (e) of this section to the FAA Oversight Office by the specified dates.

(1) Holders of STCs: no later than March 18, 2008.

(2) Applicants for STCs or amendments to TCs: No later than March 18, 2008, or within 90 days after the date of application, whichever occurs later.

(g) *Compliance plan deficiencies.* Each affected person must implement the compliance plan as approved in compliance with paragraph (e) of this section. If either paragraph (g)(1) or (2) of this section applies, the affected person must submit a corrected plan to the FAA Oversight Office and implement the corrected plan within 30 days after such notification.

(1) The FAA Oversight Office notifies the affected person of deficiencies in the proposed compliance plan and how to correct them.

(2) The FAA Oversight Office notifies the affected person of deficiencies in the person's implementation of the plan and how to correct them.

**§ 25.1811 Extended operational limit: Widespread Fatigue Damage (WFD).**

(a) *Applicability.* Any person may apply to extend an operational limit approved under § 25.571 of subpart C, § 25.1807 of this subpart, or this section. Extending the operational limit is a major change. The applicant must comply with the relevant provisions of subparts D or E of part 21 of this subchapter and paragraph (b) of this section:

(b) *Extended operational limit.* To preclude WFD from occurring in the transport category airplane fleet, each person applying for an extended operational limit must comply with the following requirements:

(1) Perform an evaluation of the airplane structural configuration to determine when WFD is likely to occur for structure susceptible to multiple site damage or multiple element damage. The airplane structural configuration to be evaluated consists of—

(i) All model variations and derivatives approved under the type

certificate for which approval for an extension is sought; and

(ii) All structural repairs, alterations, and modifications installed on each affected airplane, whether or not required by airworthiness directive, up to the date of approval of the extended operational limit.

(2) Using the results from the evaluation performed in paragraph (b)(1) of this section, establish an extended operational limit, stated as a total number of accumulated flight cycles or flight hours.

(3) Establish a supplement to the Airworthiness Limitations section (ALS) and submit it to the FAA Oversight Office for approval. The supplemental ALS must include a section titled Widespread Fatigue Damage (WFD) that incorporates the applicable extended operational limit established under paragraph (b)(2) of this section.

(4) Develop the maintenance actions determined by the WFD evaluation performed in paragraph (b)(1) of this section to be necessary to preclude WFD from occurring before the airplane reaches the proposed extended operational limit. These maintenance actions must be documented as airworthiness limitation items in the ALS and submitted to the FAA Oversight Office for approval.

**§ 25.1813 Repairs, alterations, and modifications: Widespread Fatigue Damage (WFD).**

(a) *Applicability.* This section applies to modifications identified according to § 25.1807(g)(1) of this chapter and to repairs, alterations, and modifications identified using the guidelines developed under § 25.1807(g)(3) of this subpart, that are proposed for installation on transport category airplanes with an extended operational limit approved under § 25.1811 of this subpart.

(b) *Repairs, alterations, or modification requirements.* Each person seeking approval for any repair, alteration, or modification must comply with the following:

(1) Perform an evaluation according to the applicable guidelines developed under section § 25.1807(g)(3) of this subpart to determine if any new structure or any structure affected by the repair, alteration, or modification is susceptible to WFD and, if so, when it is likely to occur. This evaluation must be performed using those guidelines or guidelines approved by the FAA Oversight Office.

(2) If the evaluation required by paragraph (b)(1) of this section concludes that WFD is likely to occur before the extended operational limit

established under § 25.1811 of this subpart, either—

(i) Modify the proposed repair, alteration, or modification to preclude WFD from occurring before the airplane reaches the extended operational limit; or

(ii) Develop the maintenance actions that must be performed to preclude WFD from occurring before the airplane reaches the extended operational limit. These maintenance actions must be developed using:

(A) Guidelines specified in § 25.1807(g)(3)(iii) of this subpart; or

(B) Guidelines approved by the FAA Oversight Office.

(3) The maintenance actions identified in paragraph (b)(2) of this section must be documented as airworthiness limitation items, submitted to the FAA Oversight Office for approval, and be made available to owners and operators of affected airplanes subject to this section.

**Appendix H to Part 25—Instructions for Continued Airworthiness**

\* \* \* \* \*

6. Amend H25.3 of Appendix H by adding paragraph (h) to read as follows:

**H25.3 Content**

\* \* \* \* \*

(h) Guidelines for identifying and evaluating repairs, alterations, and modifications to structure that may be susceptible to WFD and compromise the ability of the airplane to reach the initial operational limit.

7. Amend H25.4 of Appendix H by revising paragraph (a)(1), adding and reserving paragraph (a)(3), and adding paragraph (a)(4) to read as follows.

**Appendix H to Part 25—Instructions for Continued Airworthiness**

\* \* \* \* \*

**H25.4 Airworthiness Limitations Section**

\* \* \* \* \*

(a) \* \* \*

(1) Each mandatory modification time, replacement time, structural inspection interval, and related structural inspection procedures approved under § 25.571.

\* \* \* \* \*

(4) An operational limit, stated as a total number of accumulated flight cycles or flight hours, approved under § 25.571 of this part.

\* \* \* \* \*

**PART 121—OPERATING REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS**

8. The authority citation for part 121 continues to read:

**Authority:** 49 U.S.C. 106(g), 40113, 40119, 41706, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44901, 44903–44904, 44912, 45101–45105, 46105, 46301.

9. Amend § 121.1 by adding a new paragraph (g) to read as follows:

**§ 121. Applicability.**

\* \* \* \* \*

(g) This part also establishes requirements for operators to take actions to support the continued airworthiness of each airplane.

10. Amend part 121 by adding subpart AA to read as follows:

**Subpart AA—Continued Airworthiness and Safety Improvements**

Sec.

121.1101 Purpose and definition.

121.1103–121.1113 [Reserved]

121.1115 Widespread fatigue damage.

**Subpart AA—Continued Airworthiness and Safety Improvements**

**§ 121.1101 Purpose and definition.**

(a) This subpart requires persons holding an air carrier or operating certificate under part 119 of this chapter to support the continued airworthiness of each airplane. These requirements may include, but are not limited to, revising the maintenance program, incorporating design changes, and incorporating revisions to Instructions for Continued Airworthiness.

(b) For purposes of this subpart, the “FAA Oversight Office” is the aircraft certification office or office of the Transport Airplane Directorate with oversight responsibility for the relevant type certificate or supplemental type certificate, as determined by the Administrator.

**§ 121.1103–§ 121.1113 [Reserved]**

**§ 121.1115 Widespread fatigue damage.**

(a) *Applicability.* This section applies to certificate holders operating transport category airplanes for which an operational limit has been established under § 25.571, § 25.1807, or § 25.1811 of this chapter.

(b) *Operational limit.* No certificate holder may operate an airplane identified in paragraph (a) of this section after June 18, 2008, unless an Airworthiness Limitations section (ALS) approved under appendix H to part 25 or § 25.1807 of this chapter is incorporated into its maintenance program. The ALS must—

(1) Include an operational limit approved under § 25.571 or § 25.1807 of this chapter, as applicable, except as provided in paragraph (c) of this section; and

(2) Be clearly distinguishable within its maintenance program.

(c) *Extended operational limit.* No certificate holder may operate an airplane beyond the operational limit specified in paragraph (b)(1) of this section, unless the following conditions are met:

(1) An ALS must be incorporated into its maintenance program that—

(i) Includes an extended operational limit and any widespread fatigue damage (WFD) airworthiness limitation items (ALIs) approved under § 25.1811 of this chapter; and

(ii) Is approved under § 25.1811 of this chapter;

(2) Its maintenance program must incorporate the applicable guidelines for identifying and evaluating repairs, alterations, and modifications that have been developed according to § 25.1807(g)(3), or other guidelines approved by the FAA Oversight Office.

(3) The extended operational limit, WFD ALIs, and applicable guidelines must be clearly distinguishable within its maintenance program.

(d) *Repairs, alterations, and modifications.* This paragraph applies to modifications identified according to § 25.1807(g)(1) of this chapter and to repairs, alterations, and modifications identified in the applicable guidelines developed according to § 25.1807(g)(3) of this chapter, when installed on airplanes operating under an extended operational limit. Any certificate holder returning an airplane to service after such a repair, alteration, or modification must do the actions required by paragraph (d)(1) and (d)(2) of this section. These actions are in addition to any other actions and approvals required by this chapter.

(1) Within 90 days after return to service—

(i) Perform a WFD evaluation of the repair, alteration, or modification;

(ii) Develop any necessary maintenance actions according to § 25.1813 of this chapter; and

(iii) Submit the evaluation and proposed maintenance actions to the FAA Oversight Office through the Principal Maintenance Inspector for approval.

(2) Within 90 days after approval by the FAA Oversight Office, revise the maintenance program to incorporate any WFD ALI approved under this section.

(e) *Principal Inspector approval.* Certificate holders must submit the maintenance program revisions required

by paragraphs (b), (c), and (d) of this section to the Principal Maintenance Inspector for review and approval.

**§ 121.368 [Redesignated]**

11. Redesignate § 121.368 as new § 121.1105.

**§ 121.368 [Reserved]**

12. A new § 121.368 is added and reserved.

**§ 121.370 [Redesignated]**

13. Redesignate § 121.370 as new § 121.1107.

**§ 121.370 [Reserved]**

14. A new § 121.370 is added and reserved.

**§ 121.370a [Redesignated]**

15. Redesignate § 121.370a as new § 121.1109.

**§ 121.370a [Reserved]**

16. A new § 121.370a is added and reserved.

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

17. The authority citation for part 129 continues to read:

**Authority:** 49 U.S.C. 1372, 40113, 40119, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44901–44904, 44906, 44912, 46105, Pub. L. 107–71 sec. 104.

18. Amend § 129.1 by revising paragraph (b), and adding a new paragraph (d) to read as follows:

**§ 129.1 Applicability and definitions.**

\* \* \* \* \*

(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 and 129.20 and subpart B of this part also apply to U.S.-registered aircraft operated solely outside the United States in common carriage by a foreign air carrier or foreign person.

\* \* \* \* \*

(d) This part also establishes requirements for a foreign air carrier or foreign person to take actions to support the continued airworthiness of each airplane.

19. Amend part 129 by adding subpart A heading to read as set forth below, and designating §§ 129.1, 129.11, 129.13 through 129.15 and §§ 129.17 through 129.21, and §§ 129.23, 129.25, 129.28, and 129.29 into subpart A to read as follows:

**Subpart A—General**

\* \* \* \* \*

20. Amend part 129 by adding subpart B to read as follows.

**Subpart B—Continued Airworthiness and Safety Improvements**

Sec.

129.101 Purpose and definition.

129.103–129.113 [Reserved]

129.115 Widespread fatigue damage.

**Subpart B—Continued Airworthiness and Safety Improvements**

**§ 129.101 Purpose and definition.**

(a) This subpart requires a foreign air carrier or foreign person operating a U.S.-registered airplane in common carriage to support the continued airworthiness of each airplane. These requirements may include, but are not limited to, revising the maintenance program, incorporating design changes, and incorporating revisions to Instructions for Continued Airworthiness.

(b) For purposes of this subpart, the “FAA Oversight Office” is the aircraft certification office or office of the Transport Airplane Directorate with oversight responsibility for the relevant type certificate or supplemental type certificate, as determined by the Administrator.

**§ 129.103–§ 129.113 [Reserved]**

**§ 129.115 Widespread fatigue damage.**

(a) *Applicability.* This section applies to foreign air carriers or foreign persons operating U.S.-registered transport category airplanes for which an operational limit has been established under § 25.571, § 25.1807, or § 25.1811 of this chapter.

(b) *Operational limit.* No foreign air carrier or foreign person may operate a U.S.-registered airplane identified in paragraph (a) of this section after June 18, 2008, unless an Airworthiness Limitations section (ALS) approved under appendix H to part 25 or § 25.1807 of this chapter is incorporated into its maintenance program. The ALS must—

(1) Include an operational limit approved under § 25.571 or § 25.1807 of this chapter, as applicable, except as provided in paragraph (c) of this section; and

(2) Be clearly distinguishable within its maintenance program.

(c) *Extended operational limit.* No foreign air carrier or foreign person may operate an airplane beyond the operational limit specified in paragraph (b)(1) of this section, unless the following conditions are met:

(1) An ALS must be incorporated into its maintenance program that—

(i) Includes an extended operational limit and any widespread fatigue damage (WFD) airworthiness limitation items (ALIs) approved under § 25.1811 of this chapter; and

(ii) Is approved under § 25.1811 of this chapter;

(2) Its maintenance program must incorporate the applicable guidelines for identifying and evaluating repairs, alterations, and modifications that have been developed according to § 25.1807(g)(3), or other guidelines approved by the FAA Oversight Office.

(3) The extended operational limit, WFD ALIs, and applicable guidelines must be clearly distinguishable within its maintenance program.

(d) *Repairs, alterations, and modifications.* This paragraph applies to modifications identified according to § 25.1807(g)(1) of this chapter and to repairs, alterations, and modifications identified in the applicable guidelines developed according to § 25.1807(g)(3) of this chapter, when installed on airplanes operating under an extended operational limit. Any foreign air carrier or foreign person returning an airplane to service after such a repair, alteration, or modification must do the actions

required by paragraph (d)(1) and (d)(2) of this section. These actions are in addition to any other actions and approvals required by this chapter.

(1) Within 90 days after return to service—

(i) Perform a WFD evaluation of the repair, alteration, or modification;

(ii) Develop any necessary maintenance actions according to § 25.1813 of this chapter; and

(iii) Submit the evaluation and proposed maintenance actions to the FAA Oversight Office through the Principal Maintenance Inspector or cognizant Flight Standards International Field Office for review and approval.

(2) Within 90 days after approval by the FAA Oversight Office, revise the maintenance program to incorporate any WFD ALI approved under this section.

(e) *Principal Inspector approval.* Foreign air carriers or foreign persons must submit the maintenance program revisions required by paragraphs (b), (c), and (d) of this section to the Principal Maintenance Inspector or Flight Standards International Field Office for review and approval.

**§ 129.16 [Redesignated]**

21. Redesignate § 129.16 as new § 129.109.

**§ 129.16 [Reserved]**

22. A new § 129.16 is added and reserved.

**§ 129.32 [Redesignated]**

23. Redesignate § 129.32 as new § 129.107.

**§ 129.32 [Reserved]**

24. A new § 129.32 is added and reserved.

**§ 129.33 [Redesignated]**

25. Redesignate § 129.33 as new § 129.105.

**§ 129.33 [Reserved]**

26. A new § 129.33 is added and reserved.

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**John M. Allen,**

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