

Supporting Statement Widespread Fatigue Damage

1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection.

This final rule requires actions to preclude WFD in transport category airplanes. It applies to transport category, turbine-powered airplanes with a type certificate issued after January 1, 1958 and a maximum takeoff gross weight greater than 75,000 pounds, regardless of whether the maximum takeoff gross weight is a result of an original type certificate or a later design change. It applies to airplanes whose maximum takeoff gross weight has been decreased to 75,000 pounds or less by a design change approval for which application is made after the effective date of the rule. And it applies to all transport category airplanes to be certified in the future, regardless of maximum takeoff weight.

(1) Section 26.21 [§ 26.21(b)] requires design approval holders to establish a limit of validity of the engineering data that supports the maintenance program (LOV) for affected airplane models. This section requires design approval holders to evaluate the airplane structural configuration of each model for which they hold a type certificate to determine its susceptibility to WFD and, if susceptible, to determine that WFD would not occur before the LOV. The evaluation would be based on test data, analyses and, if available, service history, and teardown inspections of high-time airplanes. Using the results of the evaluation, the design approval holder must then establish an LOV. Although the rule allows design approval holders to establish LOVs without relying on maintenance actions, the FAA expects most current design approval holders to adopt LOVs that will rely on such actions. If they choose to establish LOVs that rely upon maintenance actions to prevent WFD before the LOV, § 26.21 requires design approval holders to identify those actions and, unless the necessary service information already exists, develop the service information in accordance with a binding schedule approved by the FAA. Those actions would then be mandated by future airworthiness directives. Section 26.21 also requires, unless previously accomplished, that design approval holders establish an Airworthiness Limitations section (ALS) in the Instructions for Continued Airworthiness for each airplane structural configuration evaluated, incorporate the applicable LOV, and submit it to the FAA Oversight Office for approval.

Section 26.21 [§ 26.21(d)] requires that design approval holders develop and submit a compliance plan to the FAA for approval. The purpose of the compliance plan is 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 an ALS and service information that is acceptable in content and format in a timely manner. 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.

(2) Sections 121.1115 and 129.115 require operators of an affected airplane to incorporate into their maintenance programs the Airworthiness Limitations section of the Instructions for

Continued Airworthiness that includes an LOV for the airplane. The amendments to parts 121 and 129 have the effect of prohibiting operation of an airplane beyond its LOV¹ unless an extended LOV is approved.

(3) Section 25.571 and Appendix H require applicants of future transport airplane designs to include the LOV in the Airworthiness Limitations section of the airplane's Instructions for Continued Airworthiness. The LOV will apply regardless of how or by whom the airplane is operated.

(4) Section 26.23 allows any person to extend the LOV for an airplane if that person can demonstrate that the airplane will be free of WFD up to the extended LOV and develops a maintenance program that supports the extended limit, if necessary. The extended LOV is optional. To operate beyond the initial LOV or any subsequent LOV, the operator must incorporate the extended LOV and the associated maintenance actions into its maintenance program and may not operate the airplane beyond that limit.

This collection of information supports the DOT strategic goal of safety.

2. Indicate how, by whom, and for what purpose the information is to be used.

TC and STC holders would use the documentation to demonstrate to their FAA Oversight Office that they have complied with the rule by establishing limits of validity of the engineering data that supports the maintenance program (LOVs). Operators would submit the LOV to their Principal Maintenance Inspectors to demonstrate that they are compliant with the rule. When the airplane is sold or transferred, the new owner would comply with the ALS requirements. An operator may not operate an airplane beyond its LOV unless the operator has incorporated an extended LOV and associated maintenance actions.

The compliance plan required by § 26.21(d) will be used by the FAA to assist the design approval holder in complying with its requirements. This requirement is modeled substantially on "The FAA and Industry Guide to Product Certification," which is currently used for developing project-specific certification plans for type certification programs to ensure that the project proceeds in a timely manner and reaches its original goal. It is necessary in this instance because the rule contains requirements for operators to incorporate the LOV into their maintenance programs. The rule specifies a date by which the design approval holder must make the LOV available to operators. The operators' compliance date, 12 months after the design approval holders' compliance date, is also specified in the rule. If the design approval holder has not produced the LOV by the specified compliance date, operators will not have the information they need. If the design approval holder produces the LOV 6 months late, then the operators will have only 6 months, instead of 12 months, until their specified compliance date. So the compliance plan is necessary to ensure that the design approval holder is progressing towards successful completion of the LOV and that there will be no unexpected delays to prevent its timely completion.

3. Describe any consideration of information technology used to reduce burden as well as any technical or legal obstacles to reducing burden.

¹ Under 14 CFR 91.403(c), no person may operate an airplane contrary to its applicable airworthiness limitations. By requiring operators to incorporate the LOV airworthiness limitations developed by the design approval holders under this rule, this final rule makes those LOVs applicable to the affected airplanes, and § 91.403(c) requires operators to comply with them.

A successful electronic submission process requires actions by both the FAA and the applicant.

- The FAA and the applicant must use compatible e-signature recognition software.
- The applicant's internal security procedures must allow transmission of proprietary data electronically in a format that can be recognized by the e-signature recognition software -- some manufacturers do not believe that encrypted e-mail is sufficiently secure.
- The FAA and/or the applicant must be able to store and retrieve records (all the compliance data and FAA approvals) for the life of the airplane, which often is longer than 50 years.

The FAA has been working toward electronic submission agreements with large airplane manufacturers since Order 8000.79 was released; however, we do not have a suitable electronic records retention system, we do not have a secure data transmission system that is acceptable to all applicants, and we cannot require that applicants change their internal procedures to transmit documents electronically with e-signatures rather than on paper with ink signatures -- a change in process must be voluntary on the part of the applicant. These issues have prevented electronic submission agreements so far. Most manufacturers will voluntarily e-mail or allow secure download of technical reports, service information, and similar data, but will simultaneously prepare and send hardcopy submittals with ink signatures.

We estimate that approximately 10% of the design approval holders and operators will submit the information electronically.

For recordkeeping, we do not require that operators keep their records in any special format.

4. Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purpose(s) described in 2 above.

These documents will be developed by TC and STC holders for operators to comply with this rule. There is no evidence of duplication because this information is not currently available elsewhere.

5. If the collection of information has a significant impact on a substantial number of small businesses or other small entities (item 14 of the Paperwork Reduction Act submission form), describe the methods used to minimize burden.

This rule will not have a significant economic impact on a substantial number of small entities for the following reasons.

1. Entities potentially affected by this rule include part 25 manufacturers; applicants for future type certificates; applicants for certain future supplemental type certificates (STCs) and amended type certificates; and part 121 and 129 operators of transport category airplanes.
2. The FAA uses the size standards from the Small Business Administration for Air Transportation and Aircraft Manufacturing, which specifies companies having less than 1,500 employees as small entities.

3. The current United States part 25 airplane manufacturers that are affected include: Boeing, Lockheed Martin, and McDonnell Douglas (a wholly-owned subsidiary of The Boeing Company). These manufacturers will incur type certificate (TC) and amended TC costs. Because all U.S. transport-aircraft category manufacturers have more than 1,500 employees, none are considered small entities.

4. Future type certificate applicants will incur additional compliance costs. But these applicants will make the choice to incur the cost only if they believe that expected revenue from additional sales will exceed the expected cost. While future STC and amended TC costs will be passed on to airplane operators, it is not possible to determine which operator will buy and install such STCs. Because expected revenue will be greater than the expected cost, the FAA believes there will not be a significant impact on a substantial number of STC applicants.

5. The FAA has determined that no part 25 manufacturers are small entities, there will not be a significant impact on a substantial number of amended TC or STC applicants, and the estimated operator compliance cost will not be significant.

The FAA will provide guidance material to aid those impacted by the proposed WFD rule.

6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently.

If the collection was not conducted or was conducted less frequently, it would be impossible for operators to comply with the rule.

7. Explain any special circumstances that require the collection to be conducted in a manner inconsistent with the general information collection guidelines in 5 CFR 1320.5(d)(2)(i)-(viii).

There is only one circumstance that requires the collection to be inconsistent with the guidelines in 5 CFR 1320.5(d)(2) and that is the requirement that the airplane records be maintained for the life of the airplane.

8. Describe efforts to consult persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), on the data elements to be recorded, disclosed, or reported.

The FAA based this proposed rule on a recommendation from the Aviation Rulemaking Advisory Committee (ARAC), which comprises, in part, representatives from various type certificate holders and operators.

This rule was published as an NPRM on April 18, 2006. Information describing the collection requirements proposed therein was included in the NPRM and comments were requested at that time. We received 61 comment submissions about the proposed rules from 40 commenters. We received comments on the development of LOVs by design approval holders, the compliance plan, training programs, and the maintenance program changes. These comments, and our responses, are discussed in the final rule.

9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.

Not applicable.

10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.

Respondents are not given assurance of confidentiality. Certain records would be available through the Freedom of Information Act.

11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private.

There are no questions of a sensitive nature.

12. Provide estimates of the hourly burden of the collection of information.

Section 21.50 already requires that at least one complete set of Instructions for Continued Airworthiness, prepared in accordance with § 25.1529, be provided to the owner of each type aircraft. This amendment to part 26 requires that holders of design approvals for certain existing transport category airplanes establish LOVs for those airplanes. Those design approval holders are also required to revise the Airworthiness Limitations section of the Instructions for Continued Airworthiness to include the LOV.

We estimate that design approval holders will spend 20 labor hours per airplane model to submit each new or revised Airworthiness Limitations Section with the LOV incorporated to the FAA for approval. We estimate that this task will take approximately 660 hours for the 33 affected models. The average annual hours are 132 during the five-year compliance period for design approval holders, with corresponding average annual costs of \$41,674 (using the burdened hourly cost of \$77 for an engineer).

Design approval holders must present a compliance plan for approval describing how they intend to comply with the requirements in the final rule. We estimate that the seven design approval holders will each produce a compliance plan for all of their affected models within the 90-day compliance period. We estimate that each design approval holder will require 62 hours to accomplish this task, resulting in a total of approximately 435 hours. We estimate the cost within the 90-day compliance period to be \$33,418.

Future applicants for either supplemental type certificates (STCs) or amendments to type certificates (TCs) that decrease or increase maximum takeoff gross weights would be developing a compliance plan for the certification project. The Paperwork Reduction Act compliance for development of these certification plans is covered by OMB's previous approval of part 21. We estimate the additional burden to include information on a plan for establishing an LOV for these airplanes would be minimal.

We estimate 2 labor hours per airplane model to submit each revised maintenance program with the LOV to the FAA for approval. We estimate this task will take the affected operators

approximately 210 hours. The average annual hours are 35 during the six-year compliance period for operators, with corresponding average annual costs of \$12,846 (using the burdened hourly cost of \$77 for an engineer).

Other costs associated with the information collection requirements within this rule (in addition to the monetized hourly costs reflected above) are minimal.

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

Documents Required to Show Compliance with the Proposed Rule	Total Labor Hours	Total Average Annual Hours	Present Value Discounted (\$2010) Cost
FAA-approved revised or new ALS	660	132	\$41,674
FAA-approved WFD compliance plan	435	435*	\$33,418
FAA-approved maintenance program revision for operators	210	35	\$12,846
Total	1305	602	\$87,938

* This one-time burden will occur in the first 90 days of the compliance period.

The FAA computed the annual recordkeeping (total hours) burden by analyzing the necessary paperwork requirements needed to satisfy each process of the proposed rule. 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.

More detailed information on the estimated number of hours for compliance by each design approval holder and operator can be found in Appendix E of this document.

13. Provide an estimate of the total annual cost burden to respondents or recordkeepers resulting from the collection of information.

There are no costs the FAA has not already included in Question 12.

14. Provide estimates of annualized cost to the Federal Government.

Conservatively assuming that half of the time will be spent by the operator filing the maintenance plans and half of the time will be spent by the FAA reviewing the maintenance plan, the average annualized cost to the Federal Government will be \$18,210.

15. Explain the reasons for any program changes or adjustments reported in Items 13 or 14 of the OMB Form 83-1.

This is a new collection.

16. For collections of information whose results will be published, outline plans for tabulation, and publication.

The FAA will publish a notice in the Federal Register informing the public that the LOVs are available on an FAA website when this information is received from the design approval holders.

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.

Approval to not display the expiration date is not requested.

18. Explain each exception to the certification statement identified in Item 19, “Certification for Paperwork Reduction Act submissions,” of OMB Form 83-1.

There are no exceptions.

Appendix A – § 25.571 and Appendix H

§ 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 of the Instructions for Continued Airworthiness required by § 25.1529. The limit of validity of the engineering data that supports the structural maintenance program (hereafter referred to as LOV), stated as a number of total accumulated flight cycles or flight hours or both, established by this section must also be included in the Airworthiness Limitations section 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 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 LOV must be established that corresponds to the period of time, stated as a number of total accumulated flight cycles or flight hours or both, 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. In that case, the Airworthiness Limitations section of the Instructions for Continued Airworthiness required by § 25.1529 must specify that no airplane may be operated beyond a number of cycles equal to ½ 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:

* * * * *

3. Amend section H25.4 of Appendix H to part 25 by revising paragraph (a)(1) 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 procedure approved under § 25.571.

* * *

(4) A limit of validity of the engineering data that supports the structural maintenance program (LOV), stated as a total number of accumulated flight cycles or flight hours or both, approved under § 25.571. Until the full-scale fatigue testing is completed and the FAA has approved the LOV, the number of cycles accumulated by the airplane cannot be greater than ½ the number of cycles accumulated on the fatigue test article.

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Appendix B – § 26.21

§ 26.21 Limit of validity.

(a) *Applicability.* Except as provided in paragraph (g) of this section, this section applies to transport category, turbine-powered airplanes with a maximum takeoff gross weight greater than 75,000 pounds and a type certificate issued after January 1, 1958, regardless of whether the maximum takeoff gross weight is a result of an original type certificate or a later design change. This section also applies to transport category, turbine-powered airplanes with a type certificate issued after January 1, 1958, if a design change approval for which application is made after [insert effective date] has the effect of reducing the maximum takeoff gross weight from greater than 75,000 pounds to 75,000 pounds or less.

(b) *Limit of validity.* Each person identified in paragraph (c) of this section must comply with the following requirements:

(1) Establish a limit of validity of the engineering data that supports the structural maintenance program (hereafter referred to as LOV) that corresponds to the period of time, stated as a number of total accumulated flight cycles or flight hours or both, during which it is demonstrated that widespread fatigue damage will not occur in the airplane. This demonstration must include an evaluation of airplane structural configurations and be supported by test evidence and analysis at a minimum and, if available, service experience, or service experience and teardown inspection results, of high-time airplanes of similar structural design, accounting for differences in operating conditions and procedures. The airplane structural configurations to be evaluated include—

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

(ii) All structural modifications to and replacements for the airplane structural configurations specified in paragraph (b)(1)(i) of this section, mandated by airworthiness directives as of [INSERT DATE 30 DAYS AFTER PUBLICATION].

(2) If the LOV depends on performance of maintenance actions for which service information has not been mandated by airworthiness directive as of [INSERT DATE 30 DAYS AFTER PUBLICATION], 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, each person identified in paragraph (c) of this section must comply with that schedule.

(3) Unless previously accomplished, establish an Airworthiness Limitations section (ALS) for each airplane structural configuration evaluated under paragraph (b)(1) of this section.

(4) Incorporate the applicable LOV established under paragraph (b)(1) of this section into the ALS for each airplane structural configuration evaluated under paragraph (b)(1) and submit it to the FAA Oversight Office for approval.

(c) *Persons who must comply and compliance dates.* The following persons must comply with the requirements of paragraph (b) of this section by the specified date.

(1) Holders of type certificates (TC) of airplane models identified in Table 1 of this section: no later than the applicable date identified in Table 1 of this section.

(2) Applicants for TCs, if the date of application was before [INSERT DATE 30 DAYS AFTER PUBLICATION]: no later than the latest of the following dates:

(i) [INSERT DATE 60 MONTHS AFTER **EFFECTIVE DATE**],

(ii) The date the certificate is issued; or

(iii) The date specified in the plan approved under § 25.571(b) for completion of the full-scale fatigue testing and demonstrating that widespread fatigue damage will not occur in the airplane structure.

(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 [INSERT DATE 18 MONTHS AFTER **EFFECTIVE DATE**].

(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 the latest of the following dates:

(i) [INSERT DATE 18 MONTHS AFTER **EFFECTIVE DATE**];

(ii) The date the certificate is issued; or

(iii) The date specified in the plan approved under § 25.571(b) for completion of the full-scale fatigue testing and demonstrating that widespread fatigue damage will not occur in the airplane structure.

(5) Applicants for either STCs or amendments to TCs that decrease maximum takeoff gross weights from greater than 75,000 pounds to 75,000 pounds or less, if the date of application was after [INSERT DATE 30 DAYS AFTER PUBLICATION]: no later than the latest of the following dates:

(i) [INSERT DATE 18 MONTHS AFTER **EFFECTIVE DATE**];

(ii) The date the certificate is issued; or

(iii) The date specified in the plan approved under § 25.571(b) for completion of the full-scale fatigue testing and demonstrating that widespread fatigue damage will not occur in the airplane structure.

(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 paragraph (c) of this section.

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

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

(4) A proposal for how the LOV 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: no later than [INSERT DATE 120 DAYS AFTER PUBLICATION].

(2) Applicants for TCs, if the date of application was before [INSERT DATE 30 DAYS AFTER PUBLICATION]: no later than [INSERT DATE 120 DAYS AFTER PUBLICATION].

(3) Holders of either supplemental type certificates 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 [INSERT DATE 120 DAYS AFTER PUBLICATION].

(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 [INSERT DATE 30 DAYS AFTER PUBLICATION]: no later than [INSERT DATE 120 DAYS AFTER PUBLICATION].

(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 is after [INSERT DATE 30 DAYS AFTER PUBLICATION]: within 90 days after the date of application.

(6) Applicants for either STCs or amendments to TCs that decrease maximum takeoff gross weights from greater than 75,000 pounds to 75,000 pounds or less, if the date of application is after [INSERT DATE 30 DAYS AFTER PUBLICATION]: within 90 days after the date of application.

(f) *Compliance plan implementation.* Each affected person must implement the compliance plan as approved in compliance with paragraph (d) of this section.

(g) *Exceptions.* This section does not apply to the following airplane models:

(1) Bombardier BD-700

(2) Bombardier CL-44

(3) Gulfstream G-V

(4) Gulfstream G-VSP

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

(6) British Aerospace (Commercial Aircraft) Ltd., Armstrong Whitworth Argosy A.W. 650 Series 101

(7) British Aerospace Airbus, Ltd., BAC 1-11

(8) BAE Systems (Operations) Ltd., BAe 146

(9) BAE Systems (Operations) Ltd., Avro 146

(10) Lockheed 300-50A01 (USAF C141A)

- (11) Boeing 707
- (12) Boeing 720
- (13) deHavilland D.H. 106 Comet 4C
- (14) Ilyushin Aviation IL-96T
- (15) Bristol Aircraft Britannia 305
- (16) Avions Marcel Dassault-Breguet Aviation Mercure 100C
- (17) Airbus Caravelle
- (18) D & R Nevada, LLC, Convair Model 22
- (19) D & R Nevada, LLC, Convair Model 23M

Table 1

Airplane Model	Compliance Date— Months after [INSERT EFFECTIVE DATE OF THE FINAL RULE]
Airbus A300 Series (all models) A310-200, -300 Series (all models) A318 (all models) A319 (all models) A320-100, -200 Series (all models) A321 (all models) A330-200, 300 Series (all models) A340-200, -300, -500, -600 Series (all models) A380-800 Series (all models)	 18 18 48 48 48 48 48 48 60
Boeing 717 (all models) 727 (all models) 737 (Classics): 737-100, 200, 200C, 300, 400, 500 737 (NG): 737-600, 700, 700C, 800, 900 747 (Classics): 747-100, 200B, 200F, 200C, 747SR, 747SP, 100B, 300, 100B SUD 747-400: 747-400, 400D, 400F 757 (all models) 767 (all models) 777: 777-200, 300 777: 777-200LR, 300ER	 48 18 18 48 18 48 48 48 48 48 60
Bombardier CL-600: 2D15 (Regional Jet Series 705), 2D24 (Regional Jet Series 900)	60
Embraer ERJ 170 (all models) ERJ 190 (all models)	60 60
Fokker F.28 Mark 70, Mark 100 (all models)	18
Lockheed L-1011 (all models)	18

Airplane Model	Compliance Date— Months after [INSERT EFFECTIVE DATE OF THE FINAL RULE]
L188 (all models)	18
382 (all models)	18
McDonnell Douglas	
DC-8 (all models)	18
DC-9 (all models)	18
MD-80 (all models)	18
MD-90-30 (all models)	48
DC-10 (all models)	18
MD-10 (all models)	48
MD-11 (all models)	48

Appendix C – § 26.23

§ 26.23 Extended limit of validity.

(a) *Applicability.* Any person may apply to extend a limit of validity of the engineering data that supports the structural maintenance program (hereafter referred to as LOV) approved under § 25.571 of this subchapter, § 26.21, or this section. Extending an LOV is a major design 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 limit of validity.* Each person applying for an extended LOV must comply with the following requirements:

(1) Establish an extended LOV that corresponds to the period of time, stated as a number of total accumulated flight cycles or flight hours or both, during which it is demonstrated that widespread fatigue damage will not occur in the airplane. This demonstration must include an evaluation of airplane structural configurations and be supported by test evidence and analysis at a minimum and, if available, service experience, or service experience and teardown inspection results, of high-time airplanes of similar structural design, accounting for differences in operating conditions and procedures. The airplane structural configurations to be evaluated include—

(i) All model variations and derivatives approved under the type certificate for which approval for an extension is sought; and

(ii) All structural modifications to and replacements for the airplane structural configurations specified in paragraph (b)(1)(i), mandated by airworthiness directive, up to the date of approval of the extended LOV.

(2) Establish a revision or supplement, as applicable, to the Airworthiness Limitations section (ALS) of the Instructions for Continued Airworthiness required by § 25.1529 of this subchapter, and submit it to the FAA Oversight Office for approval. The revised ALS or supplement to the ALS must include the applicable extended LOV established under paragraph (b)(1) of this section.

(3) 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 LOV. These maintenance actions must be documented as airworthiness limitation items in the ALS and submitted to the FAA Oversight Office for approval.

Appendix D – §§ 121.1115 and 129.115

§ 121.1115 Limit of validity.

(a) *Applicability.* This section applies to certificate holders operating any transport category, turbine-powered airplane with a maximum takeoff gross weight greater than 75,000 pounds and a type certificate issued after January 1, 1958, regardless of whether the maximum takeoff gross weight is a result of an original type certificate or a later design change. This section also applies to certificate holders operating any transport category, turbine-powered airplane with a type certificate issued after January 1, 1958, regardless of the maximum takeoff gross weight, for which a limit of validity of the engineering data that supports the structural maintenance program (hereafter referred to as LOV) is required in accordance with § 25.571 or § 26.21 of this chapter after [insert effective date].

(b) *Limit of validity.* No certificate holder may operate an airplane identified in paragraph (a) of this section after the applicable date identified in Table 1 of this section unless an Airworthiness Limitations section approved under Appendix H to part 25 or § 26.21 of this chapter is incorporated into its maintenance program. The ALS must—

(1) Include an LOV approved under § 25.571 or § 26.21 of this chapter, as applicable, except as provided in paragraph (f) of this section; and

(2) Be clearly distinguishable within its maintenance program.

(c) *Operation of airplanes excluded from § 26.21.* No certificate holder may operate an airplane identified in § 26.21(g) of this chapter after [INSERT DATE 30 MONTHS AFTER EFFECTIVE DATE], unless an Airworthiness Limitations section approved under Appendix H to part 25 or § 26.21 of this chapter is incorporated into its maintenance program. The ALS must

—

(1) Include an LOV approved under § 25.571 or § 26.21 of this chapter, as applicable, except as provided in paragraph (f) of this section; and

(2) Be clearly distinguishable within its maintenance program.

(d) *Extended limit of validity.* No certificate holder may operate an airplane beyond the LOV, or extended LOV, specified in paragraph (b)(1), (c), (d), or (f) of this section, as applicable, unless the following conditions are met:

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

(i) Includes an extended LOV and any widespread fatigue damage (WFD) airworthiness limitation items (ALIs) approved under § 26.23 of this chapter; and

(ii) Is approved under § 26.23 of this chapter.

(2) The extended LOV and the airworthiness limitation items pertaining to widespread fatigue damage must be clearly distinguishable within its maintenance program.

(e) *Principal Maintenance 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.

(f) *Exception.* For any airplane for which an LOV has not been approved as of the applicable compliance date specified in paragraph (c) or Table 1 of this section, instead of including an approved LOV in the ALS, an operator must include the applicable default LOV specified in Table 1 or Table 2 of this section, as applicable, in the ALS.

Table 1—Airplanes Subject to § 26.21

Airplane Model	Compliance Date— Months after [Insert Effective Date of the Fi- nal Rule]	Default LOV [flight cycles (FC) or flight hours (FH)]
Airbus		
A300 B2 Series	30	48,000 FC
A300 B4-100 Series	30	40,000 FC
A300 Model B4-200	30	34,000 FC
A300 B4-600	30	30,000 FC / 67,500 FH
A300 B4-600R, F4-600R, and C4-600R	30	30,000 FC / 67,500 FH
A310-200 Series (all models)	30	40,000 FC / 60,000 FH
A310-300 Series (all models)	30	35,000 FC / 60,000 FH
A318 (all models)	60	48,000 FC / 60,000 FH
A319 (all models)	60	48,000 FC / 60,000 FH
A321 (all models)	60	48,000 FC / 60,000 FH
A320-100 Series (all models)	60	48,000 FC / 48,000 FH
A320-200 Series (all models)	60	48,000 FC / 60,000 FH
A330-200, 300 Series (except WV050 fam- ily) (non enhanced)	60	40,000 FC / 60,000 FH
A330-200, 300 Series WV050 family (en- hanced)	60	33,000 FC / 100,000 FH
A340-200, 300 Series(except WV 027 and WV050 family) (non enhanced)	60	20,000 FC / 80,000 FH
A340-200, 300 Series WV 027 (non en- hanced)	60	30,000 FC / 60,000 FH
A340-300 SeriesWV050 family (enhanced)	60	20,000 FC / 100,000 FH
A340-500, 600 Series (all models)	60	16,600 FC / 100,000 FH
A380-800 Series (all models)	72	NOTE
Boeing		
717 (all models)	60	60,000 FC / 60,000 FH
727 (all models)	30	60,000 FC
737 (Classics): 737-100, 200, 200C, 300, 400, 500	30	75,000 FC
737 (NG): 737-600, 700, 700C, 800, 900	60	75,000 FC
747 (Classics): 747-100, 200B, 200F, 200C, 747SR, 747SP, 100B, 300, 100B SUD	30	20,000 FC
747-400: 747-400, 400D, 400F		

Airplane Model	Compliance Date— Months after [Insert Effective Date of the Fi- nal Rule]	Default LOV [flight cycles (FC) or flight hours (FH)]
757 (all models) 767 (all models) 777: 777-200, 300 777: 777-200LR, 300ER	60 60 60 60 72	20,000 FC 50,000 FC 50,000 FC 40,000 FC 40,000 FC
Bombardier CL-600: 2D15 (Regional Jet Series 705), 2D24 (Regional Jet Series 900)	72	60,000 FC
Embraer ERJ 170 (all models) ERJ 190 (all models)	72 72	NOTE NOTE
Fokker F.28 Mark 70, Mark 100 (all models)	30	90,000 FC
Lockheed L-1011 (all models) L188 (all models) 382 (all models)	30 30 30	36,000 FC 26,600 FC 20,000 FC / 50,000 FH
McDonnell Douglas DC-8 (all models) DC-9 (all models) MD-80 (all models) MD-90 (all models) DC-10-10 (all models) DC-10-30, -40 (all models) MD-10-10F (all models) MD-10-30F (all models) MD-11 (all models)	30 30 30 60 30 30 60 60 60	50,000 FC / 50,000 FH 100,000 FC / 100,000 FH 50,000 FC / 50,000 FH 60,000 FC / 90,000 FH 42,000 FC / 60,000 FH 30,000 FC / 60,000 FH 42,000 FC / 60,000FH 30,000 FC / 60,000 FH 20,000 FC / 60,000 FH
Maximum Takeoff Gross Weight Changes All airplanes whose maximum takeoff gross weight has been decreased to 75,000 pounds or below after [insert date 60 days after the date of publication in the <u>Federal Register</u>] or increased to greater than 75,000 pounds at any time by an amended type certificate or supplemental type certificate	30, or date of approval of the design change, or date specified in the plan approved under § 25.571(b) for establishing the LOV, whichever	Not applicable

Airplane Model	Compliance Date— Months after [Insert Effective Date of the Fi- nal Rule]	Default LOV [flight cycles (FC) or flight hours (FH)]
	occurs latest	

NOTE: Airplane operation limitation is stated in the Airworthiness Limitation section.

Table 2—Airplanes Excluded from § 26.21

Airplane Model	Default LOV [flight cycles (FC) or flight hours (FH)]
Airbus Caravelle	15,000 FC / 24,000 FH
Avions Marcel Dassault Breguet Aviation Mercure 100C	20,000 FC / 16,000 FH
Boeing Boeing 707 (-100 series and -200 series) Boeing 707 (-300 series and -400 series) Boeing 720	20,000 FC 20,000 FC 30,000 FC
Bombardier CL-44D4 and CL-44J BD-700-1A1D	20,000 FC 15,000 FH
Bristol Aeroplane Company Britannia 305	10,000 FC
British Aerospace Airbus, Ltd. BAC 1-11 (all models)	85,000 FC
British Aerospace (Commercial Aircraft) Ltd. Armstrong Whitworth Argosy A.W. 650 Series 101	20,000 FC
BAE Systems (Operations) Ltd. BAe 146-100A (all models) BAe 146-200-07 BAe 146-200-07 Dev BAe 146-200-11 BAe 146-200-07A BAe 146-200-11 Dev BAe 146-300 (all models) Avro 146-RJ70A (all models) Avro RJ85A and RJ100A (all models)	50,000 FC 50,000 FC 50,000 FC 50,000 FC 47,000 FC 43,000 FC 40,000 FC 40,000 FC 50,000 FC
D & R Nevada, LLC Convair Model 22 Convair Model 23M	1,000 FC/1,000 FH 1,000 FC/1,000 FH

Airplane Model	Default LOV [flight cycles (FC) or flight hours (FH)]
deHavilland Aircraft Company, Ltd.	
D.H. Comet 4C	8,000 FH
Gulfstream	
G-V	40,000 FH
G-VSP	40,000 FH
Ilyushin Aviation Complex	
IL-96T	10,000 FC / 30,000 FH
Lockheed	
300-50A01 (USAF C 141A)	20,000 FC

129.115 Limit of validity.

(a) *Applicability.* This section applies to foreign air carriers or foreign persons operating any U.S.-registered transport category, turbine-powered airplane with a maximum takeoff gross weight greater than 75,000 pounds and a type certificate issued after January 1, 1958, regardless of whether the maximum takeoff gross weight is a result of an original type certificate or a later design change. This section also applies to foreign air carriers or foreign persons operating any other U.S.-registered transport category, turbine-powered airplane with a type certificate issued after January 1, 1958, regardless of the maximum takeoff gross weight, for which a limit of validity of the engineering data that supports the structural maintenance program (hereafter referred to as LOV) is required in accordance with § 25.571 or § 26.21 of this chapter after [insert effective date].

(b) *Limit of validity.* No foreign air carrier or foreign person may operate a U.S.-registered airplane identified in paragraph (a) of this section after the applicable date identified in Table 1 of this section, unless an Airworthiness Limitations section (ALS) approved

under Appendix H to part 25 or § 26.21 of this chapter is incorporated into its maintenance program. The ALS must—

(1) Include an LOV approved under § 25.571 or § 26.21 of this chapter, as applicable, except as provided in paragraph (f) of this section; and

(2) Be clearly distinguishable within its maintenance program.

(c) *Operation of airplanes excluded from § 26.21.* No certificate holder may operate an airplane identified in § 26.21(g) of this chapter after [INSERT DATE 30 MONTHS AFTER

EFFECTIVE DATE], unless an ALS approved under Appendix H to part 25 or § 26.21 of this chapter is incorporated into its maintenance program. The ALS must—

(1) Include an LOV approved under § 25.571 or § 26.21 of this chapter, as applicable, except as provided in paragraph (f) of this section; and

(2) Be clearly distinguishable within its maintenance program

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

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

(i) Includes an extended LOV and any widespread fatigue damage (WFD) airworthiness limitation items (ALIs) approved under § 26.23 of this chapter; and

(ii) Is approved under § 26.23 of this chapter;

(2) The extended LOV and the airworthiness limitation items pertaining to widespread fatigue damage must be clearly distinguishable within its maintenance program.

(e) *Principal Maintenance 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.

(f) *Exception.* For any airplane for which an LOV has not been approved as of the applicable compliance date specified in paragraph (c) or Table 1 of this section, instead of including an approved LOV in the ALS, an operator must include the applicable default LOV specified in Table 1 or Table 2 of this section, as applicable, in the ALS.

Table 1—Airplanes Subject to § 26.21

Airplane Model	Compliance Date— Months after [INSERT EF- FECTIVE DATE OF FI- NAL RULE]	Default LOV [flight cycles (FC) or flight hours (FH)]
Airbus		
A300 B2 Series	30	48,000 FC
A300 B4-100 Series	30	40,000 FC
A300 Model B4-200	30	34,000 FC
A300 B4-600	30	30,000 FC / 67,500 FH
A300 B4-600R, F4-600R, and C4-600R	30	30,000 FC / 67,500 FH
A310-200 Series (all models)	30	40,000 FC / 60,000 FH
A310-300 Series (all models)	30	35,000 FC / 60,000 FH
A318 (all models)	60	48,000 FC / 60,000 FH
A319 (all models)	60	48,000 FC / 60,000 FH
A321 (all models)	60	48,000 FC / 60,000 FH
A320-100 Series (all models)	60	48,000 FC / 48,000 FH
A320-200 Series (all models)	60	48,000 FC / 60,000 FH
A330-200, 300 Series (except WV050 family) (non enhanced)	60	40,000 FC / 60,000 FH
A330-200, 300 Series WV050 family (enhanced)	60	33,000 FC / 100,000 FH
A340-200, 300 Series(except WV 027 and WV050 family) (non enhanced)	60	20,000 FC / 80,000 FH
A340-200, 300 Series WV 027 (non enhanced)	60	30,000 FC / 60,000 FH
A340-300 Series WV050 family (enhanced)	60	20,000 FC / 100,000 FH
A340-500, 600 Series (all models)		
A380-800 Series (all models)	60	16,600 FC / 100,000 FH
	72	NOTE
Boeing		
717 (all models)	60	60,000 FC / 60,000 FH
727 (all models)	30	60,000 FC
737 (Classics): 737-100, 200, 200C, 300, 400, 500	30	75,000 FC
737 (NG): 737-600, 700, 700C, 800, 900	60	75,000 FC
747 (Classics): 747-100, 200B, 200F, 200C, 747SR, 747SP, 100B, 300, 100B SUD	30	20,000 FC

Airplane Model	Compliance Date— Months after [INSERT EFFECTIVE DATE OF FINAL RULE]	Default LOV [flight cycles (FC) or flight hours (FH)]
747-400: 747-400, 400D, 400F 757 (all models) 767 (all models) 777: 777-200, 300 777: 777-200LR, 300ER	60 60 60 60 72	20,000 FC 50,000 FC 50,000 FC 40,000 FC 40,000 FC
Bombardier CL-600: 2D15 (Regional Jet Series 705), 2D24 (Regional Jet Series 900)	72	60,000 FC
Embraer ERJ 170 (all models) ERJ 190 (all models)	72 72	NOTE NOTE
Fokker F.28 Mark 70, Mark 100 (all models)	30	90,000 FC
Lockheed L-1011 (all models) L188 (all models) 382 (all models)	30 30 30	36,000 FC 26,600 FC 20,000 FC / 50,000 FH
McDonnell Douglas DC-8 (all models) DC-9 (all models) MD-80 (all models) MD-90 (all models) DC-10-10 (all models) DC-10-30, -40 (all models) MD-10-10F (all models) MD-10-30F (all models) MD-11 (all models)	30 30 30 60 30 30 60 60 60	50,000 FC / 50,000 FH 100,000 FC / 100,000 FH 50,000 FC / 50,000 FH 60,000 FC / 90,000 FH 42,000 FC / 60,000 FH 30,000 FC / 60,000 FH 42,000 FC / 60,000FH 30,000 FC / 60,000 FH 20,000 FC / 60,000 FH
Maximum Takeoff Gross Weight Changes All airplanes whose maximum takeoff gross weight has been decreased to 75,000 pounds or below after [insert date 60 days after the date of publication in the <u>Federal Register</u>] or	30, or date of approval of the design change, or date specified in the plan approved under	Not applicable

Airplane Model	Compliance Date— Months after [INSERT EFFECTIVE DATE OF FINAL RULE]	Default LOV [flight cycles (FC) or flight hours (FH)]
increased to greater than 75,000 pounds at any time by an amended type certificate or supplemental type certificate	§ 25.571(b) for establishing the LOV, whichever occurs latest	

NOTE: Airplane operation limitation is stated in the Airworthiness Limitation section.

Table 2—Airplanes Excluded from § 26.21

Airplane Model	Default LOV [flight cycles (FC) or flight hours (FH)]
Airbus	
Caravelle	15,000 FC / 24,000 FH
Avions Marcel Dassault	
Breguet Aviation Mercure 100C	20,000 FC / 16,000 FH
Boeing	
Boeing 707 (-100 series and -200 series)	20,000 FC
Boeing 707 (-300 series and -400 series)	20,000 FC
Boeing 720	30,000 FC
Bombardier	
CL-44D4 and CL-44J	20,000 FC
BD-700-1A1D	15,000 FH
Bristol Aeroplane Company	
Britannia 305	10,000 FC
British Aerospace Airbus, Ltd.	
BAC 1-11 (all models)	85,000 FC
British Aerospace (Commercial Aircraft) Ltd.	
Armstrong Whitworth Argosy A.W. 650 Series 101	20,000 FC
BAE Systems (Operations) Ltd.	
BAe 146-100A (all models)	50,000 FC
BAe 146-200-07	50,000 FC
BAe 146-200-07 Dev	50,000 FC
BAe 146-200-11	50,000 FC
BAe 146-200-07A	47,000 FC
BAe 146-200-11 Dev	43,000 FC
BAe 146-300 (all models)	40,000 FC
Avro 146-RJ70A (all models)	40,000 FC
Avro RJ85A and RJ100A (all models)	50,000 FC
D & R Nevada, LLC	
Convair Model 22	1,000 FC/1,000 FH
Convair Model 23M	1,000 FC/1,000 FH

Airplane Model	Default LOV [flight cycles (FC) or flight hours (FH)]
deHavilland Aircraft Company, Ltd.	
D.H. Comet 4C	8,000 FH
Gulfstream	
G-V	40,000 FH
G-VSP	40,000 FH
Ilyushin Aviation Complex	
IL-96T	10,000 FC / 30,000 FH
Lockheed	
300-50A01 (USAF C 141A)	20,000 FC

Appendix E – Design Approval Holder and Operator Compliance Hours

Table 1—Design Approval Holder Compliance

Design Approval Holder	Group I Airplanes (18 months)		Group II Airplanes (48 months)		Group III Airplanes (60 months)		Total ALS Revisions	Hours (20/ALS Revision)
	Models	Estimated Number of ALS Revisions	Models	Estimated Number of ALS Revisions	Models	Estimated Number of ALS Revisions		
Airbus	2	2	6	6	1	1	9	180
Boeing	3	3	6	6	1	1	10	200
Bombardier					1	1	1	20
Embraer					2	2	2	40
Fokker	1	1					1	20
Lockheed	3	3					3	60
McDonnell Douglas (Boeing)	4	4	3	3			7	140
Total		13		15		5	33	660

ALS—Airworthiness Limitations section

Table 2—Operator Compliance

Operator		Group I Airplanes (30 months)		Group II Airplanes (60 months)		Group III Airplanes (72 months)		Total Revised Maintenance Programs	Hours (2/Revised Maintenance Program)
		Models	Estimated Number of Revised Maintenance Programs	Models	Estimated Number of Revised Maintenance Programs	Models	Estimated Number of Revised Maintenance Programs		
Passenger	AirTran Airways			2	2			2	4
	Alaska Airlines	3	1	3	1			2	4
	Allegiant Air			6	2			2	4
	American Airlines			6	4	1	1	5	10
	Continental Airlines			9	3	1	1	4	8
	Delta Air Lines			17	8	2	1	9	18
	Frontier Airlines			3	3	2	2	5	10
	Hawaiian Airlines			5	4			4	8
	JetBlue Airways			1	1	1	1	2	4
	Midwest Airlines			1	1	2	2	3	6
	Southwest Airlines			3	1			1	2
	Spirit Airlines			3	3			3	6
	Sun Country Airlines			2	1			1	2
	United Airlines			7	7	1	1	8	16
	US Airways	2	1	9	7	1	1	9	18
	USA3000 Airlines			1	1			1	2
	Virgin America			2	2			2	4
Total Passenger		2		51		10		63	126
	ABX Air	1	1	1	1			2	4
	Air Transport International	4	1	1	1			2	4
	Aloha Air	1	1					1	2

