

**Disposition of Public Comments**  
**AC 120-YY, Widespread Fatigue Damage of Metallic Structure**

	Comment	Requested Change	Disposition
<b>Commenter: Airworthiness Assurance Working Group (AAWG<sup>1</sup>)</b>			
1.	<p><b>Request for Deferral or Withdrawal of AC 120-YY</b></p> <p>On April 17, 2007, the AAWG presented to the Aviation Rulemaking Advisory Committee (ARAC) its final report<sup>2</sup> on Task 3 — addressing repairs, alterations, and modifications for widespread fatigue damage (WFD). The AAWG stated that, to address repairs, alterations, and modifications for WFD, the baseline airplane structure<sup>3</sup> must be addressed first. As a result, the AAWG developed an AC (AC 120-WFD) that it proposed for use in addressing baseline airplane structure. The AAWG believed that the FAA-proposed AC 120-YY did not provide a means of compliance for addressing WFD in baseline airplane structure and establishing an LOV.</p> <p>The AAWG stated that they understood that the FAA was working on the final rule and revising guidance material to go with it. As</p>	<p>The AAWG requested that the FAA use AC 120-WFD instead of the FAA-proposed AC 120-YY. AC 120-WFD differences from proposed AC 120-YY include:</p> <ol style="list-style-type: none"> <li>1. Replacement of the term “initial operational limit” with the term “limit of validity of the engineering data that supports the maintenance program (LOV).”</li> <li>2. Removal of all guidance material for evaluating repairs, alterations, and modifications for WFD.</li> <li>3. Revision of the guidance material for addressing baseline airplane structure for WFD and establishing LOVs and extended LOVs.</li> <li>4. Addition of a timeline for when design approval holders and operators should complete compliance tasks.</li> </ol>	<p>In response to the AAWG’s requests for changes as presented in the working group’s alternative AC, the FAA has eliminated the requirement to evaluate WFD associated with most repairs, alterations, and modifications of the baseline airplane structure.<sup>4</sup> We have also made a change in terminology. The final rule and AC 120-YY use the term “limit of validity of the engineering data that supports the structural maintenance program” (LOV) rather than the term “initial operational limit.” We have revised the AC to clarify the process for establishing the LOV under § 26.21 and the extended LOV under § 26.23 and to reflect a change to the operational rules. The operational rules now specify the obligations of operators of airplanes for which the type certificate (TC) holder fails to establish an LOV. The AC provides guidance for operators for such an occurrence.</p>

<sup>1</sup> The Airworthiness Assurance Working Group (AAWG) commented on the AC by providing an alternative version that addresses baseline structure. The companies represented are Boeing, Airbus, American Airlines, Northwest Airlines, US Airways, UPS, Federal Express, ABX (previously known as Airborne Express), Continental Airlines, Japan Air Lines, United Airlines, and British Airways.

<sup>2</sup> A Report of the Airworthiness Assurance Working Group: “Recommendations Concerning ARAC Tasking FR Doc. 04-10816, RE: Aging Airplane Safety Final Rule, 14 CFR 121.370a and 129.16, Task 3 Final Report,” Revision A, dated April 11, 2007.

<sup>3</sup> *Baseline airplane structure* means structure that is designed under the original type certificate or amended type certificate for that airplane model.

<sup>4</sup> The final rule requires that design approval holders evaluate airplane configurations that include modifications mandated by airworthiness directive.

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	<p>a result, the working group stated that the conclusions and recommendations made in the report must be considered to have been based on the best available information. They expected that the FAA would consider the report when developing final guidance, but understood that their recommendations may no longer be valid if the FAA changes its course of action or other material becomes available.</p>	<p>5. Revision of the applicability of the rule to limit it to certain “transport category, turbine-powered airplanes with a type certificate issued after January 1, 1958.”</p>	<p>We find that AC 120-YY does not need to specify a timeline for when design approval holders and operators should complete compliance tasks because the compliance dates are explicitly defined in the final rule. We agree with the comment regarding applicability. We have changed the wording in the final rule and the AC reflects that change.</p>
<p><b>Commenter: AAWG, Airline Transport Association (ATA), and, with additional comments, certain industry representatives who are members of AAWG<sup>5</sup></b></p>			
<p>2.</p>	<p><b>Repairs, Alterations, and Modifications</b></p> <p>These commenters stated that the AC should be limited to addressing baseline airplane structure for WFD and to establishing LOVs and service actions (maintenance actions) to support LOVs. Repairs, alterations, and modifications should be addressed under the Damage Tolerance Data for Repairs and Alterations (DT Data) rulemaking initiative.</p>	<p>These commenters requested the following:</p> <ul style="list-style-type: none"> <li>• Limit AC 120-YY to baseline structure and establishment of LOV.</li> <li>• Include guidance material for addressing repairs, alterations, and modifications for WFD in AC 120-93.</li> </ul>	<p>We agree with the commenter’s recommendations and the rule has been changed to reflect that. We have revised AC 120-YY accordingly.</p> <p>As for AC 120-93, however, we find that guidance in that AC should only provide a means of compliance with the Aging Airplane Safety Rule (AASR) and the DT Data Rule at this time. If we determine later that additional rulemaking is necessary to address repairs, alterations, and modifications for WFD, we will then determine which of the advisory circulars should be revised.</p>

<sup>5</sup> The companies represented are Boeing, Airbus, American Airlines, Northwest Airlines, US Airways, UPS, Federal Express, ABX (previously known as Airborne Express), Continental Airlines, Japan Air Lines, United Airlines, and British Airways. Although their comments are not representative of the views of other members of the AAWG, including national authorities, for simplicity the source of these comments is identified hereafter as “certain industry representatives who are members of AAWG.”

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<b>Commenter: Gulfstream, General Electric</b>			
3.	<p><b>Repairs, Alterations, and Modifications</b>  <u>Page 67, Appendix H.</u></p> <p>Gulfstream stated that the items identified below are already covered by damage tolerance requirements and are not peculiar to WFD.</p> <ol style="list-style-type: none"> <li>1. A modification that covers structure requiring periodic inspection by the operator's maintenance program. (Modifications must be reviewed to account for the differences from the TC holder baseline maintenance program requirements.)</li> <li>2. A modification that changes areas of the fuselage from being externally inspectable with visual means to being uninspectable (for example, a large external fuselage doubler that results in details being hidden, rendering them visually uninspectable).</li> </ol> <p>Because § 25.571 already requires that the modifications above be assessed for damage tolerance, there should be no need to include them in the AC.</p> <p>General Electric stated that the AC should not include nacelle structure as an example of structure that should be considered for WFD evaluations. The commenter argued</p>	<p>Gulfstream requests clarification on the Appendix H list for modifications that cover structure and modifications that change areas from being externally inspectable to being uninspectable. Gulfstream stated that the subject two items should be removed from Appendix H.</p> <p>General Electric requests that nacelle structures be deleted from the list in Appendix H.</p>	<p>We have removed Appendix H from the final AC. As a result, no further clarification is necessary.</p>

	<b>Comment</b>	<b>Requested Change</b>	<b>Disposition</b>
	that the list in AC 120-93 (DT Data for Repairs and Alterations) excluded nacelles because they do not meet the definition of “fatigue critical structure.”		
<b>Commenter: Gulfstream, Boeing</b>			
<b>4.</b>	<p><b>Repairs, Alterations, and Modifications Chapter 8.</b></p> <p>Gulfstream and Boeing argued that it would not be practical for manufacturers to develop guidelines for others to use in addressing repairs, alterations, and modifications because the guidelines would be too general to be of use.</p>	<p>Gulfstream requests that the FAA develop guidelines for addressing repairs, alterations, and modifications for WFD by tasking ARAC.</p> <p>Boeing requests that the FAA remove Chapter 8, Guidelines.</p>	<p>We have eliminated the requirement to evaluate WFD associated with most repairs, alterations, and modifications of the baseline airplane structure. As a result, we agree with the request to remove the guidelines (Chapter 8) and have revised the AC accordingly.</p>
<b>Commenter: AAWG, Boeing, and, with additional comments, certain industry representatives who are members of AAWG</b>			
<b>5.</b>	<p><b>Use the term LOV instead of initial operational limit</b> <u>Pages 22 - 26, CHAPTER 4 – OPERATIONAL LIMITS, Paragraphs 400, 401, and 402.</u></p> <p>The AAWG stated that the AC should use the term “limit of validity” instead of “initial operational limit.”</p>	<p>The AAWG recommended that LOV be defined as follows:</p> <p>LOV is the limit of validity of the engineering data that supports the maintenance program that has been substantiated through service experience, analysis, and/or test to preclude widespread fatigue damage.</p>	<p>We’ve revised the final AC to replace the term “initial operational limit” with “limit of validity of the engineering data that supports the structural maintenance program.” This change aligns with the final rule.</p> <p>We also added a discussion entitled “Why Do You Need an LOV?” to introduce the LOV concept.</p>
<b>Commenter: AAWG, Boeing, ATA, and, with additional comments, certain industry representatives who are members of AAWG</b>			
<b>6.</b>	<b>Establishing an LOV to preclude WFD.</b>	The commenters request that the AC be	We have revised this AC to align with the

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	<p><u>Entire AC.</u></p> <p>These commenters stated that the advisory material did not provide a means of compliance. Boeing stated that Chapter 3 of the AC is comparable to a textbook on the subject and does not include standards on how to establish a limit of validity (LOV).</p> <p>According to the commenters, these deficiencies could result in establishment of an LOV based solely on analyses of structure susceptible to multiple site damage and multiple element damage, without consideration of more relevant and reliable data, such as test evidence and service experience. In addition, these commenters concluded that airplanes could be operated well past the point to which the engineering data supports safe operation.</p>	<p>rewritten to provide performance-based criteria.</p> <p>Boeing requests that the AC be limited to the means for establishing an LOV and the maintenance actions required to support the LOV.</p> <p>The commenters want the criteria for establishing an LOV to be based on fatigue test evidence. As with the rule, in the opinion of the commenter the AC should explicitly use the term “fatigue test evidence” to refer to the collective body of information that should be considered in establishing an LOV.</p>	<p>final rule. The NPRM proposed that holders of design approvals for existing airplanes subject to the rule be required to evaluate every WFD-susceptible structure to determine when WFD is likely to occur. Using the results from the evaluation, the design approval holder would then establish an LOV.<sup>6</sup> The final rule requires design approval holders to establish an LOV and demonstrate that WFD will not occur in the airplane up to that point. This demonstration must include an evaluation of airplane structural configurations that must be supported by test evidence and analysis. If available, service experience, or service experience and teardown inspection results, may be added to the test evidence and analysis to provide additional substantiation. The service experience and teardown inspections must be of high-time airplanes of similar structural design, accounting for differences in operating conditions and procedures.</p> <p>Chapter 2 of the final AC (proposed chapter 4) defines a process for establishing an LOV. Among other things, the process includes the step for performing a WFD evaluation. The details of a WFD evaluation are now contained in Appendix 6 of the final AC.</p>

<sup>6</sup> Based on comments to the final rule, we are using the term “limit of validity of the engineering data that support the structural maintenance program,” or LOV, to express the point beyond which an airplane cannot be operated instead of the term “initial operational limit.” To simplify discussion of comments, this table reflects that change as well.

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<b>Commenter: AAWG, Boeing, Airbus, and, with additional comments, certain industry representatives who are members of AAWG</b>			
7.	<p><b>When to set an LOV for existing airplanes Chapter 4.</b></p> <p>These commenters stated that the airplanes most at risk for developing WFD should be evaluated first. Airplanes in this category would be those that have exceeded their design service goal. Other models should be evaluated before the high-time airplane reaches its design service goal. These commenters also stated that the implementation timescales should be harmonized between EASA and FAA.</p>	<p>The commenters request that implementation be based on a phased-approach for establishing LOV, addressing the oldest airplanes first. The commenters further request that the AC include a schedule for when design approval holders should perform the WFD evaluation and establish the LOV.</p> <p>For those airplanes where the high-time airplane has already exceeded the DSG, the WFD-related maintenance instructions (LOV plus required maintenance actions to preclude WFD) should be provided to the FAA for AD action by June 20, 2009 or one and a half years before the compliance date for §121.1115 or §129.115, whichever is later.</p> <p>For all other airplanes, this activity needs to begin when the high-time airplane is at 75% DSG, or 5 years before it is expected to reach DSG. All TC holder-related WFD material must be submitted to the FAA for AD action one and a half years before the high-time airplane will reach DSG.</p>	<p>We agree that it is rational to have compliance times for establishing LOVs based on the relative safety risk—oldest airplanes first—and on available resources. We have revised the compliance times in the final rule accordingly. For existing airplanes, the final rule uses a phased approach for establishing LOVs and divides the compliance dates for holders of design approvals and applicable airplane models into three groups, based on their certification basis for § 25.571. Because the rule has specific compliance times, it is not necessary to include a schedule in the AC for when compliance activities should be completed.</p> <p>The FAA has been discussing the implementation timescales with other national airworthiness authorities, such as EASA, to harmonize rules and advisory material.</p>

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<b>Commenter: Gulfstream</b>			
8.	<p><b>When to set LOV for new type certification programs</b>  <u>402.a. page 23.</u></p> <p>Gulfstream stated that the overall timeframe is too short for setting LOVs for new TC programs where the application is made after the effective date of the final rule. The commenter said that the WFD assessment should occur after the basic damage tolerance evaluation is completed.</p>	<p>Gulfstream requested that the WFD assessment be completed after completion of the fatigue test where all maintenance instructions are reassessed, including an assessment on WFD.</p>	<p>We have removed paragraph 402.a of the proposed AC, which addressed new type certificate programs, because that guidance is defined in AC 25.571-1X. We have revised AC 120-YY to reference AC 25.571-1X as the applicable guidance for new type certification programs.</p> <p>For new type certificate programs, the LOV is a function of the fatigue knowledge available at the time the LOV is established. There should be sufficient data to establish an LOV for a new airplane model once full-scale fatigue test evidence is completed and assessed. As with Amendment 25-96, the final rule allows applicants the time to complete the testing after certification provided it is done in accordance to a plan approved by the Administrator. Except for the testing, applicants must show compliance with § 25.571 before issuance of the TC. Any person may extend the LOV under § 26.23 after additional data has been developed to support such an extension. Eliminating the requirement to address repairs, alterations, and modifications will simplify the process for extending the LOV.</p>

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<b>Commenter: AAWG, Boeing, ATA</b>			
9.	<p><b>How to set LOVs</b></p> <p><u>Chapters 3 and 4.</u></p>	<p>These commenters recommend that the required “evaluation” explicitly include the following tasks, which are described in the AAWG’s 2003 report<sup>7</sup> as necessary to establish or extend an LOV.</p> <ol style="list-style-type: none"> <li>1. Ensure that the basics of the aging airplane program are in existence;</li> <li>2. Collect data necessary to extend fatigue test evidence;</li> <li>3. Perform analysis of the structure for multiple site damage and multiple element damage; and</li> <li>4. Create and update maintenance documents to include maintenance actions and modifications for those areas where it has been predicted that multiple site damage and multiple element damage will occur before the proposed LOV.</li> </ol>	<p>For suggested task 1, the FAA agrees that having basics of the four elements of the Aging Aircraft Program<sup>8</sup> in place is necessary for continued safe operation of airplanes. The final rule does not include requirements for them because they are already mandated by airworthiness directives, operational rules, and airworthiness limitations. This final AC states that the requirement to establish an LOV is the last element of a series of initiatives meant to ensure the continued airworthiness of aging airplanes. The AC also identifies AC 91-56B as further guidance on those initiatives</p> <p>In reference to tasks 2 and 3, we have revised the proposed AC to follow the final rule by clarifying that, for an LOV to be acceptable, the supporting evaluation must demonstrate that the fatigue characteristics and any specified maintenance actions are sufficient to prevent WFD from occurring before the LOV. The evaluation must be supported by test evidence and analysis. The design approval holder may augment the test evidence and analysis with any available service experience, or service experience and teardown inspection results</p>

<sup>7</sup> AAWG, Widespread Fatigue Damage Bridge Tasking Report, July 23, 2003

<sup>8</sup> Mandatory modification, corrosion prevention and control, supplemental structural inspection, and repair assessment.

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			<p>of high-time airplanes. Service experience and teardown inspection results must be of airplanes of similar structural design and must account for differences in operating conditions and procedures.</p> <p>For proposed task 4, we agree that design approval holders must develop maintenance actions to support an LOV if the LOV relies on those maintenance actions to prevent WFD. They are not required to develop maintenance actions if they can show that such actions are not necessary to prevent WFD before the airplanes reach LOV. We have revised the AC to clarify the relationship between the LOV and maintenance actions and what is necessary for compliance with § 26.21 and § 26.23, for initial and subsequent LOVs.</p> <p>We have rewritten the AC to align with the rule. The AC includes a process for establishing an LOV for a model's airplane structural configuration.</p>
<b>Commenter: AAWG</b>			
10.	<p><b>How to set LOVs</b>  <u>Pages 22 - 26, CHAPTER 4 – OPERATIONAL LIMITS, Paragraphs 400, 401, and 402.</u></p> <p>The AAWG-proposed AC includes a new section with specific steps for establishing an</p>	<p>The AAWG requests that proposed AC 120-YY be revised to provide the steps/tasks for establishing an LOV. From the viewpoint of the AAWG, the first task for the TC holder is to establish a candidate LOV. Discussion with operators may be useful in determining</p>	<p>The FAA finds that additional clarification is necessary for the steps the design approval holder (DAH) should take to establish an LOV. This final AC incorporates the concept of the commenter's suggested seven-step process for establishing an LOV. The process</p>

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	<p>LOV. That AC proposed that operators assist the TC holder in developing the LOV. It says that the TC holder must determine if there is commercial interest in developing an LOV in discussion with the airplane's operators. If there is interest, the TC holder must develop the data necessary to complement the fatigue test evidence.</p>	<p>an initial number. A candidate LOV may or may not become the actual LOV presented to the FAA for compliance. The TC holder should validate whether to use the candidate LOV or adjust it up or down based on results of the following steps:</p> <p><b>Step 1</b> – Validate that the Aging Programs are in place and operational, if applicable.</p> <p><b>Step 2</b> – Examine the data that establishes the amount of fatigue test evidence available.</p> <p><b>Step 3</b> - Estimate the cost of additional TC holder/operator actions required in collecting additional fatigue test evidence.</p> <p><b>Step 4</b> - Make an upper limit estimate of the LOV based on the data examined.</p> <p><b>Step 5</b> – Evaluate the maintenance actions and costs required to maintain safety out to the candidate LOV.</p> <p><b>Step 6</b> – Provide a rationale for the cost of the package. The candidate LOV may need to be adjusted based on the cost of additional required testing or data collection and the maintenance actions.</p> <p><b>Step 7</b> – Revise required certification documents for an operator to take</p>	<p>contained in the final AC includes four steps: (1) identifying a candidate LOV, (2) identifying WFD-susceptible structure, (3) performing a WFD evaluation of all susceptible structure, and (4) finalizing the LOV.</p> <p>The specific details of performing a WFD evaluation, which was proposed in Chapter 3 of AC 120-YY, is now contained in Appendix 6 of the final AC.</p>

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		advantage of the LOV including the development of maintenance actions.	
<b>Commenter: Gulfstream</b>			
<b>11.</b>	<p><b>Fatigue and design service goal</b> <u>Page 9, Paragraph 200.</u></p> <p>There is no discussion on how to handle cracking detected during a fatigue test.</p>	<p>The AC should include guidance for how to handle cracking detected during a fatigue test.</p>	<p>AC 25.571-1X includes guidance on post-test evaluations and post-test corrective actions. This includes addressing cracking that could lead to WFD. We have revised AC 120-YY to reference AC 25.571-1X as guidance should a design approval holder complying with § 26.21 find cracking during fatigue testing.</p>
<b>Commenter: Gulfstream</b>			
<b>12.</b>	<p><b>Maintenance actions— Structural Modification Point (SMP) and Inspection Start Point (ISP)</b> <u>Page 19, Paragraph 304.</u></p> <p>Paragraph 304(a) of the proposed AC offered a discussion of reliability, and 304(b) specified an absolute scatter factor (2 if inspections are effective and 3 if inspections are not effective). The commenter noted that when setting an ISP, the absolute scatter factors may be used, but a statistical method for arriving at a scatter factor may also be used. The commenter requests that both methods be allowed for setting the SMP as well.</p>	<p>The commenter requested that the AC provide a means for setting the SMP that includes an option for using a statistical method as an alternative to the fixed method for determining the scatter. The statistical method for determining the appropriate scatter factors should depend on the number of data points and the operational loads. The guidance should include what reliability levels are required.</p> <p>The commenter also requests that for setting ISP the AC include consideration of 25.571 methods for single load path (SLP) structure (rogue flaw). Additionally, if basic 25.571</p>	<p>The general approach in the proposed AC for setting ISP and SMP is based on statistical considerations. Both Weibull and log normal distributions were considered when developing the fatigue life distributions used to establish the ISP and SMP. The factors of 2 and 3 applied to WFD<sub>(average behavior)</sub> give generally acceptable reliability levels. In the proposed AC, those factors were prescribed as a way to establish ISPs, if applicable, and SMPs. In the final AC, we revised the text to specify that these approaches were examples. If the applicant has other data that can be used, an alternative approach can be submitted in the compliance plan.</p>

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		<p>considerations require an inspection threshold, that threshold should meet the requirements for the ISP.</p>	<p>An ISP may be established only when it has been determined that inspections will reliably detect MSD or MED. The approach required by § 25.571 SLP might be acceptable for setting an ISP, but because that approach is based on assuming the structure contains an initial flaw of the maximum probable size that could exist as a result of manufacturing or service-induced damage, it would generally result in a very conservative ISP. Fatigue damage associated with MSD and MED results from the inevitable fatigue wear-out of structure, regardless of any anomalous manufacturing or in-service events. Therefore, even if the threshold is based on anomalous events, the repetitive inspection requirements must be based on representative MSD or MED cracking scenarios.</p>
<b>Commenter: Gulfstream</b>			
13.	<p><b>Maintenance actions— Structural Modification Point (SMP) and Inspection Start Point (ISP)</b> <u>Pages 19, Paragraph 304.</u></p> <p>It should be recognized that using WFD (average) may not adequately cover safety.</p>	None.	<p>The proposed and final ACs acknowledge that WFD cannot be absolutely precluded because there is always some probability, no matter how small, of it occurring. Thus the AC specifies that, to minimize the probability of WFD, there should be a maintenance action to modify or replace structure at a pre-determined, analytically derived time.</p>
<b>Commenter: AAWG</b>			
14.			

	<b>Comment</b>	<b>Requested Change</b>	<b>Disposition</b>
	<p><b>Data and Documentation</b>  <u>Pages 34 - 35, CHAPTER 7 – DATA AND DOCUMENTATION.</u></p> <p>The AAWG (through its proposed AC) added guidance for updating a TC holder’s published information, such as service bulletins and structural repair manuals.</p>	<p>The AAWG proposed that the AC include guidance for updating a TC holder’s published information. The commenter said that this information should be provided at the same time the LOV and maintenance actions are provided to the FAA for approval.</p>	<p>We agree that in order to establish an LOV the design approval holder needs to have identified the maintenance actions necessary to prevent WFD within the LOV. Those maintenance actions may include both service bulletins and structural repair manuals. The final rule allows design approval holders time after establishing the LOV to develop the service instructions that define those maintenance actions. The service information must be developed and approved in accordance with a binding schedule approved by the cognizant ACO. The final AC clarifies that certain information must be included with the LOV in order for the FAA to approve the schedule. This information should include the structure to be inspected, modified, or replaced; the method of inspection, modification, or replacement; the point in time at which to begin inspections, modifications, or replacements; and the repeat inspection interval.</p>
<p><b>Commenter: AAWG, ATA, and, with additional comments, certain industry representatives who are members of AAWG</b></p>			
<p><b>15.</b></p>	<p><b>How to Extend LOVs</b>  <u>Page 27, Paragraph 403.</u></p> <p>These commenters stated that the AC should include a process for establishing the initial LOV and that subsequent LOVs should follow that same process. This comment was reflected in the AAWG’s proposed AC.</p>	<p>The commenters recommended that the AC be revised to include a sequential process in which the baseline configuration is addressed first, followed by alterations and then repairs as necessary. The operator would be responsible for assembling all maintenance requirements depending on</p>	<p>We partially agree. We have revised the requirements of § 26.23(b) to be consistent with § 26.21(b). We have removed the requirements to address repairs, alterations, and modifications (except for those modifications and replacements mandated by AD) for both the original LOV and for any extended LOV. As a result, the</p>

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		the actual airplane configuration.	<p>extended LOV is for the baseline airplane structure and, in general, follows the same process as that followed for the original LOV.</p> <p>The extended LOV process does differ from the initial LOV process, however, in the way that maintenance actions are handled. For the initial LOV, the LOV must be established as an airworthiness limitation but if maintenance actions are required in order to ensure freedom from WFD up to the LOV, those maintenance actions will be required by AD. For an extended LOV, however, any required maintenance actions must be defined with the LOV itself as airworthiness limitation items.</p> <p>We have revised the AC to clarify the steps for establishing an extended LOV and to identify the differences between that process and the one for establishing the initial LOV.</p>
<b>Commenter: AAWG</b>			
16.	<p><b>How to Extend LOVs</b>  <u>Incorporation of Extended LOVs</u>  Page 40, CHAPTER 11.  <u>INCORPORATION OF EXTENDED OPERATIONAL LIMITS, Paragraph 1101.</u>  <u>AIRWORTHINESS LIMITATIONS SECTION.</u></p>	<p>The commenter requested that the AC include guidance for establishing an extended LOV. The commenter maintained that if the operator wants to operate beyond the published LOV, then the operator should contact the TC holder to investigate the possibility of a revised LOV. This contact should allow</p>	<p>We agree that the AC should include guidance on when the process for establishing an extended LOV should start. The applicant should consider the age (flight cycles or flight hours or both) of high-time airplanes relative to the existing LOV to determine when to start developing the data to extend it. The final AC has been</p>

	<b>Comment</b>	<b>Requested Change</b>	<b>Disposition</b>
	The AAWG AC included a time line for when operators should contact the design approval holder for starting the process of establishing an extended LOV and associated data package, including any maintenance actions to support the extended LOV.	a minimum time of four years before a revised LOV will be needed so the TC holder has sufficient time to prepare the extension package.	revised accordingly.
<b>Commenter: Gulfstream</b>			
17.	<p><b>Airworthiness Limitations Section (ALS)</b> <u>Pages 29, Paragraph 404(a).</u></p> <p>There is no need to have a separate section within the ALS for WFD. Any limits based on the WFD evaluation should be treated the same as any other inspection or part replacement.</p>	The commenter requested that the AC (and the rule) not specify a requirement for a separate WFD section within the ALS.	We agree. We have revised the rule and the AC accordingly.
<b>Commenter: Gulfstream</b>			
18.	<p><b>Airworthiness Limitations Section</b> <u>Pages 29, Paragraph 404(b).</u></p> <p>Gulfstream noted that, for new TCs, WFD evaluations and guidelines (for repairs and alterations) will most likely not have been completed by delivery of the first airplane. The commenter states that WFD should not be treated separately from other § 25.571 issues.</p>	The commenter requested that the AC specify that the first priority for the TC holder is development of inspections to insure protection from manufacturing (rogue flaw) and operationally induced damage. The second priority would be to identify WFD issues after the investigation of any fatigue test findings.	<p>We have deleted reference to guidelines for repairs and alterations from this AC and AC 25.571-1X to align with the rule.</p> <p>We have revised AC 120-YY to reference AC 25.571-1X as the guidance for new type certification programs.</p>
<b>Commenter: Gulfstream</b>			

	<b>Comment</b>	<b>Requested Change</b>	<b>Disposition</b>
<b>19.</b>	<p><b>Airworthiness Limitations Section</b>  <u>Pages 29, Paragraph 404(b)(1).</u></p> <p>The ALS should not contain the LOV until testing is completed. This is because changing an ALS is an involved process that often requires proposed rulemaking.</p>	<p>The commenter requested that the AC be changed to base the LOV on analysis and component tests completed before issuance of the TC. In a second step, the LOV that was included in the ALS would be validated by full-scale fatigue test. If any cracking were found, then maintenance actions would be developed to address that cracking.</p>	<p>AC 25.571-1X provides guidance for steps to take if full-scale fatigue testing is not completed when the airplane is certified. We revised AC 120-YY to reference AC 25.571-1X as being the applicable guidance for new type certification programs.</p>
<b>Commenter: AAWG, Boeing, and, for additional comments, certain industry representatives who are members of AAWG</b>			
<b>20.</b>	<p><b>Airplane Configuration</b>  <u>Page 24, Paragraph 402(b)(1).</u></p> <p>The commenters said that the AC should provide guidance allowing design approval holders to consider only those AD-mandated structural modifications or replacements that have a significant effect on the WFD characteristics of the structure. They thought that by including only the rule text and no other guidance in the AC, the FAA had missed an opportunity to reduce the impact of the rule on industry and on themselves.</p>	<p>In addition to joining in the general comments made by the other commenters, Boeing requested that the paragraph be rewritten to include a process similar to that proposed by ARAC for the AASFR, by which AD modifications and replacements could be easily reviewed and dispositioned for their effect on WFD details.</p>	<p>The design approval holder must define the airplane structural configuration for which the LOV will be established, and that structural configuration must include all AD-mandated structural modifications or replacements. Once the configuration has been established, the design approval holder can then identify which modifications and replacements need to be assessed for WFD. The AC has been revised to include additional guidance on screening replacements and modifications mandated by ADs.</p>
<b>Commenter: Airbus</b>			
<b>21.</b>	<p><b>Applicability for existing airplanes—  composite structures.</b></p>	<p>Airbus requests clarification on whether the rule and AC only applies to metallic</p>	<p>Airbus is correct and, in response to this comment, we have revised the rule and AC</p>

	<b>Comment</b>	<b>Requested Change</b>	<b>Disposition</b>
	<p>Airbus stated that the title of the AC, “Widespread Fatigue Damage on Metallic Structure,” indicates that the WFD concern is uniquely related to metallic structure. This is not mentioned in the proposed rule.</p>	<p>structure.</p>	<p>to make clear that they apply to airplanes with metallic structure.</p> <p>The FAA issued AC 20-107B as guidance for certifying composite structures, including evaluating composite structure in relation to the damage tolerance requirements of § 25.571. Among other things, that AC provides guidance on testing and analyses needed to certify aircraft structure constructed from composites.</p> <p>The objective of the final rule and this AC is to address the normal fatigue wear out of metallic structure. Although the trend in industry is to use composites as much as possible, a significant percentage of a new airplane may still be built of metal. Full-scale fatigue test evidence would be necessary to demonstrate that WFD will not occur in that metallic structure. It would also be necessary for the design approval holder to develop an LOV to limit its operation to the point in time up to which it has been demonstrated that WFD will not occur in the airplane’s metallic structure.</p>
<b>Commenter: Gulfstream</b>			
22.	<p><b>Criteria for excepting future airplanes</b></p> <p>Gulfstream contended that there should be allowances or guidance for exempting, or</p>	<p>The commenter requested that the AC give guidance for excluding new airplanes from the requirement for LOVs. The commenter’s suggestions</p>	<p>This final AC does not address future airplanes. AC 25.571-1X applies to new TC projects. Section 25.571 requires all persons applying for TCs after the effective</p>

	<b>Comment</b>	<b>Requested Change</b>	<b>Disposition</b>
	showing equivalent safety for, new TC applications.	<p>for characteristics that would exclude an airplane include:</p> <ol style="list-style-type: none"> <li>1. A certification basis which includes the latest amendment of § 25.571 (fatigue testing required);</li> <li>2. An accumulation of few flight cycles or flight hours every year;</li> <li>3. A specific type of operation (high altitude, for example); and</li> <li>4. Operation under the rules of either part 91 or 135.</li> </ol>	date of the rule to establish an LOV and demonstrate that WFD will not occur up to that LOV, regardless of how those airplanes are operated. This approach is consistent with recommendations made in 2003 by the General Structures Harmonization Working Group, a separate working group within ARAC.
<b>Commenter: AAWG</b>			
23.	<p><b>Reporting and Recordkeeping</b>  <u>Pages 43 – 45, PART 3, REPORTING, CHAPTER 13 (page 43), GENERAL INFORMATION ABOUT PART 3; CHAPTER 14 (page 44), DESIGN APPROVAL HOLDER REPORTING; CHAPTER 15 (page 45), OPERATOR REPORTING.</u></p> <p>AAWG’s proposed AC deletes PART 3 (REPORTING) because operator information is included with its requested changes to Chapter 10 (requested new chapter 3). The text on operator’s reporting requirements, which were in proposed Chapter 15, are contained in paragraph 303</p>	<p>The AAWG-proposed AC does not include a discussion on reporting requirements for design approval holders as was proposed in AC 120-YY.</p> <p>The AAWG-proposed AC revised the operator reporting and recordkeeping guidance as follows:</p> <p><b>302. EXISTING RESPONSIBILITIES.</b></p> <p><b>a. Reporting Requirements.</b> There are no added reporting requirements associated with the WFD rulemaking. However, the FAA encourages operators</p>	<p>Although the reporting requirements have not changed because of the WFD rule, we find that having guidance for design approval holders is as important as it is for operators. Also, the guidance on reporting for design approval holders and operators is based on an earlier recommendation from AAWG.</p> <p>Reporting and recordkeeping are not part of the actions necessary for design approval holders and operators to comply with the rule. They are, however, valuable for determining what future actions, if any, are necessary to address WFD. As a result, we have determined that it is important to tell</p>

	Comment	Requested Change	Disposition
	of AAWG's proposed AC	<p>to report significant findings to the type certificate holders to ensure that prompt fleet action is taken. Existing reporting requirements under 14 CFR § 121.703 still apply.</p> <p><b>b. Recordkeeping Requirements.</b> There are no added recordkeeping requirements associated with the WFD rulemaking. Existing record-keeping requirements are still applicable.</p>	design approval holders and operators what details to include when reporting structural defects in compliance with existing rules. The information these details provide will help identify structural defects that fit the categories of MED and MSD and may be precursors to WFD. We have revised the AC to include the proposed reporting and recordkeeping guidance for design approval holders and for operators.
<b>Commenter: AAWG</b>			
24.	<p><b>Transfer of Airplanes</b>  <u>Page 45, CHAPTER 15, OPERATOR REPORTING.</u></p> <p>The AAWG's proposed AC revises the guidance on reporting and recordkeeping requirements for operators. It also adds guidance on the transfer of airplanes. AC 120-YY did not include guidance to ensure that operators are in compliance when operating newly transferred airplanes.</p>	<p>The commenter-proposed AC included the following guidance on the transfer of airplanes.</p> <p><b>c. Transfer of Airplanes after WFD rulemaking compliance date.</b> Before adding an airplane to an air carrier's operations specifications or operator's fleet, the following should apply:</p> <p><b>(1) For airplanes previously operated under an FAA-approved maintenance program,</b> the new operator should ensure all applicable WFD rulemaking requirements (LOV, maintenance actions, etc...) are incorporated into the new operator's maintenance program.</p> <p><b>(2) For airplanes not previously operated under an FAA-approved</b></p>	We agree with the commenter and have added text concerning transferred airplanes and foreign registered airplanes that will be operated under part 121 or 129. This change is consistent with the guidance in AC 120-93.

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		<p><b>maintenance program</b>, the operator incorporates all applicable WFD rulemaking requirements (LOV, maintenance actions, etc...) as required.</p> <p><b>d. Operation of Leased Foreign-Owned Airplanes.</b> Acquisition of a leased foreign-owned airplane for use in operations under 14 CFR parts 121, or 129 will require the certificate holder to develop and implement the ALS.</p>	
<b>Commenter: AAWG</b>			
25.	<p><u>Pages 49 – 52, APPENDICES C and D.</u></p> <p>AAWG revised the list of acronyms and definitions found in Appendices C and D of the proposed AC.</p>	<p>The AAWG-generated AC eliminated some terms from the definitions table, revised definitions of other terms, and added definitions.</p>	<p>We have revised the acronym list as necessary to reflect the final AC.</p> <p>We partially agree with the AAWG. We have deleted definitions that no longer apply to the rule and AC and revised the definition of damage tolerance as proposed by the commenter.</p> <p>We have revised the definition of Instructions for Continued Airworthiness to be consistent with AC 26-1, and we have revised and added other definitions to be consistent with the rule and the AC.</p>