

DISPOSITION OF PUBLIC COMMENTS

Policy Statement PS-ANM-25-18, *Post-Maintenance Checks and Tests*

Prepared by [Robert C. Jones](#), ANM-112

No.	Comment	Requested Change	Disposition
	Commenter: Airbus	Deleted Text: Strikethrough , Proposed Text: <u>Underlined</u>	
1.	<p>Comment on Page 5, Para 1 “Process development”:</p> <p>It is not clear in the proposal how FAA interprets the word ‘identify’ in their requirement for the applicant ‘...to identify appropriate airplane level checks...’</p> <p>It is understood that a new process will identify the test/check which will then be included in the AMM at the end of the maintenance / servicing task accomplishment procedure. It is further understood that there is no requirement to identify this particular check/test within the AMM as different from any other step of the maintenance task. i.e. this proposal is not a new way of introducing the ‘Key Safety Indicator – KSI concept nor is it intended as an extension of the CDCCL concept developed for Fuel Tank System.</p>	<p>Introduce a sentence to clarify that the goal of the Policy Statement is to ensure that necessary post-maintenance checks and tests are included in AMMs but there is no intention that these shall be identified as more important than any other step within that AMM accomplishment instruction.</p>	<p>We believe the policy as written is clear and have not changed this policy as requested. It does not require an applicant to highlight the identified or selected check or test in any way. Further, the selected test or check is not considered to be more important than any other step in the accomplishment instructions of the airplane maintenance manual (Instructions for Continued Airworthiness (ICA), airplane maintenance manual (AMM), task card, etc.). Therefore, there is no need to add the requested language.</p> <p>Regarding critical design configuration control limitations (CDCCLs), they are a specific type of airworthiness limitations for fuel tank systems. As specified in section H25.4(a)(2), appendix H to part 25, these types of airworthiness limitations define particular design features that must be protected. They must be contained in a specific section of the Instructions for Continued Airworthiness (ICA) titled “Airworthiness Limitations,” which is treated differently than the content of other sections of the ICA. This policy does not create a new type of airworthiness limitations.</p>

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2.	<p>Comment on Page 3, Section “Background”:</p> <p>The example provided on page 3 does not support the Policy Statement. In this example, bullet 3 states that the AMM instructions included an appropriate airplane-level check to be accomplished after performing the maintenance task. Thus the applicant’s documentation appears to have been compliant with this Policy Statement.</p> <p>The issue of maintenance crew not following procedures is another subject. Indeed, the earlier KSI and CDCCL initiatives focused on identifying to the operator specific steps of procedures as more important for continued airworthiness than other steps.</p>	<p>Introduce an example where an accident / incident occurred because the applicant for design approval had failed to provide appropriate checks and/or tests to prevent the airplane from being returned to service in an unsafe condition.</p>	<p>We partially concur. We agree with adding an additional example. The new example discusses an in-service incident where a gust lock lever moved into the unlock position during flight.</p> <p>However, we disagree that the example provided in the proposed policy does not support the policy. The NTSB finding stated that the maintenance personnel skipped a critical step that would have likely detected the incorrect rigging and prevented the accident. That critical step was one of many steps in a full functional check of the airplane. However, the maintenance crew only performed a cable tensioning. In the accident report, the maintenance crew stated they did not think a full check was required after doing only this single task. The FAA interviewed a customer service engineer and was told that, typically after cable tensioning, they might not expect the maintenance crew to do a post-maintenance functional check or test. There was no specific test or check called out following this particular maintenance task, and the maintenance manual did not instruct maintenance personnel to do a complete post-maintenance check after completing only one task in the series. Therefore, this is an appropriate example.</p>

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3.	<p>Comment on Page 5, Section “Policy”: Paragraphs 2.1 and 2.3 make reference to ‘major’ hazards. Since the Policy Statement also makes reference to AC 1309-1A and SSA it is unclear whether the word ‘major’ is inferring the ‘Major’ effect classification defined in 25.1309 or whether it is intended to be a general term that can later be defined by the applicant. If the former, then it is questioned why the PS is not limited to consideration of Hazardous & Catastrophic effect classifications. These have been previously accepted as ‘unsafe conditions’ while the ‘Major’ effect classification has not.</p>	<p>Either introduce alternative wording to describe the impact on system operation that can lead to an unsafe condition (avoiding the use of the word ‘major’) or clarify that the applicant shall consider checks / tests that, if not performed correctly, could lead to Hazardous or Catastrophic failure conditions as defined in the AC 25.1309.1A.</p>	<p>We concur and have changed the policy as requested to clarify that the applicant should consider selecting post-maintenance functional tests and checks to prevent hazardous or catastrophic failure conditions, as defined in AC 25.1309-1A.</p>

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4.	<p>Comment on Page 1, Section “Subject”: FAR 1 reminds that: “<i>Maintenance</i> means inspection, overhaul, repair, preservation, and the replacement of parts, but excludes preventive maintenance.” “<i>Preventive maintenance</i> means simple or minor preservation operations and the replacement of small standard parts not involving complex assembly operations.” The subject implies that the subject checks and tests are performed after <u>maintenance only</u>. Does it mean that there is no need for such checks and tests after preventive maintenance, rebuilding, or alteration? FAA AC 20-62E reminds that: “Rebuilt. Describes an aircraft, airframe, aircraft engine, propeller, or appliance, using new or used parts that conform to new part tolerances and limits or to approved oversized or undersized dimensions that has undergone the following: (1) Has been disassembled, cleaned, inspected, repaired as necessary, and</p>	<p>It is proposed to amend the subject (i) to make sure these checks and tests are performed and signed by appropriately qualified personnel, (ii) to make sure they are also applied following preventive maintenance, rebuilding, or alteration, and finally (iii) to ensure consistency across Federal Aviation Regulations. The following amendments to the Subject are proposed (also for sake of harmonization with European regulations): “<u>Error capturing Post-Maintenance checks and/or tests in maintenance, preventive maintenance, rebuilding, or alteration activities</u>”</p>	<p>We partially concur. We disagree with changing the policy title and using the term “error capturing.” However, we agree that post-maintenance checks should be applied following maintenance; preventive, out-of-sequence maintenance, or segmented maintenance; rebuilding; or alteration activities. Instead of adopting the requested language, we have included a definition of our meaning of post-maintenance tests and checks in the “Definition of Key Terms” section. We are issuing this policy to help original equipment manufacturers develop and use a process to appropriately identify tests and checks that will detect errors and issues that impact safety. It is out of the scope of this policy to determine whether performance of such checks or tests should be signed off. Rules guidance related to this are established elsewhere.</p>

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	<p>reassembled to the extent possible.</p> <p>(2) Has been tested to the same tolerances and limits as a new item.”</p> <p>The subject also implies that these checks and tests are performed <u>after</u> maintenance. Does the approval for return to service for products and articles that have undergone maintenance need to be signed <u>before</u> these checks and tests are performed? Does it also mean these checks and tests are not maintenance? So, who is taking the responsibility for the accomplishment of these checks/tests?</p>		

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5.	<p>Comment on Page 1, Section “Summary”: Instructions for Continued Airworthiness (ICA) are a source for operators to develop the program required by FAR 121.367 (or equivalent). The objective of this policy statement seems to be to provide operators (and maintenance providers) with ICA that:</p> <ul style="list-style-type: none"> Indicate which maintenance, preventive maintenance, rebuilding, or alteration tasks derived from design activities could result in a failure, malfunction, or defect endangering the safe operation of an aircraft if not performed properly or if improper materials are used (In other words, the application of this policy should create an input expected in the frame of the NPRM 12-07), and Include error capturing checks and/or tests. <p>Airbus supports this initiative.</p> <p>ICA should be developed with due consideration for the lessons learned advertised on FAA website that indicate: “Certain key maintenance tasks should be identified, and emphasized in a manner that ensures required tasks are consistently and correctly accomplished”. This would</p>	<p>The following amendments to the introductory sentences are proposed: “The purpose of this proposed policy statement would be to describe a process for applicants for design approval to use to identify <u>error capturing checks and/or tests</u> that may prevent an airplane from being returned to service in an unsafe condition. <u>Error capturing checks and/or tests are actions performed in addition to those required by the affected task with the objective of detecting errors that may occur during the performance of such task. Error capturing checks and/or tests need to be adequate to the specific task and the disturbance of the structure/system.</u></p> <p>This process can be used in evaluating the hazard effect of improper maintenance, <u>preventive maintenance, rebuilding, or alteration</u>. Applicants may use this process to <u>indicate in the Instructions for Continued Airworthiness (ICA) which (maintenance, preventive maintenance, rebuilding, or alteration) tasks could result in a failure, malfunction, or defect endangering the safe operation of an aircraft if not performed properly or if improper materials are used, and to include select-associated error capturing checks and/or tests that may will</u></p>	<p>We partially concur. We disagree with using the term “error capturing” because it implies only errors committed by mechanics result in unsafe conditions. In some cases, other things, such as installation of a component containing a failure, may cause an unsafe condition. Further, performing functional checks/tests after maintenance (i.e., post-maintenance checks/tests) might also detect other issues.</p> <p>In addition, the policy does not provide for identifying in the ICA which tasks or malfunctions could result in a safety impact. It only provides a means for evaluating potential maintenance errors and issues, assessing the safety impact of the errors issues, and selecting checks or tests to be included in a maintenance task. While we agree this might be a suitable method to implement “key safety indicators,” because such tasks would also indicate potential safety impact, that is outside the scope of this policy. Therefore, we did include the requested statement concerning ICA.</p> <p>However, we agree that post-maintenance checks/tests are intended to detect and correct errors and other issues that could be introduced during maintenance, including preventive, out-of-sequence, or segmented maintenance; rebuilding; or alteration activities. We have revised the Summary paragraph to indicate so.</p>

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	<p>participate in ensuring the appropriate development of programs downstream (i.e. on operator side).</p> <p>In addition, it would be appropriate to define the term “error capturing checks and/or tests” in this policy statement.</p> <p>Therefore, it is proposed to amend and complement the introductory sentences.</p>	<p>detect improper maintenance, <u>preventive maintenance, rebuilding, or alteration</u> and include them in their Instructions for Continued Airworthiness (ICA).</p>	
6.	<p>Comment on Page 1, Section “Summary”:</p> <p>The summary gives the impression that no error capturing checks and/or tests are needed for maintenance, preventive maintenance, rebuilding, or alteration applicable to the airplane structure.</p> <p>It can be shown that some tasks for the airplane structure may generate, if not performed properly or if improper materials are used, failures or malfunctions that may be as severe as those observed for the airplane systems.</p> <p>It is proposed to amend and complement the introductory sentences.</p>	<p>The following amendments to the introductory sentences are proposed:</p> <p>“This policy describes the use of <u>safety assessments of structure and systems, such as system safety assessment (SSA) and functional hazard assessment (FHA) data developed to show compliance with Title 14, Code of Federal Regulations (14 CFR) part 25 system certification rules</u>, to help determine where appropriate <u>error capturing</u> checks and/or tests are needed.</p>	<p>We do not concur and have not incorporated the requested change. The proposed language is general such that structures are not excluded. Note that there are many cases where there are structural elements used in systems. However, these guidelines are created with systems in mind. Often structures are evaluated using only visual inspections and many are not amenable to functional tests or checks. For such cases, inspection for proper assembly may be the only reasonable method.</p>

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7.	<p>Comment on Page 1, Section “Summary,” and Page 5, Section “Policy,” Para 2. “Best Practices”</p> <p>The summary indicates that applicants may also introduce additional error capturing checks and/or tests for non-safety business purposes. This implies that compliance with some of the error capturing checks and/or tests will not be mandatory.</p> <p>Operators and maintenance providers should be provided with the means to make the difference between the maintenance, preventive maintenance, rebuilding, or alteration tasks requiring (mandatory) the implementation of an error capturing check and/or test and the others (for which the implementation is recommended only). This is justified on the basis of the lessons learned advertised on FAA website that indicate that “Certain key maintenance tasks should be identified, and emphasized in a manner that ensures required tasks are consistently and correctly accomplished.”</p> <p>It is proposed to amend and complement the Policy Best practice.</p>	<p>The following step in the Policy paragraph 2 Best practice is proposed:</p> <p><u>“2.4 When this process is also used for non-safety business purposes, flag/mark maintenance, preventive maintenance, rebuilding, or alteration tasks which could result in a failure, malfunction, or defect endangering the safe operation of an aircraft if not performed properly or if improper materials are used, as identified in step 2.1 above. The distinction will be the basis for operators and maintenance providers to establish rules of compliance, i.e. mandatory (for airworthiness purposes) or recommended (for non-safety business purposes).”</u></p>	<p>We do not concur and did not incorporate the requested change. As discussed in Airbus comment 3 on page 3, this policy only designates detecting maintenance errors that have a safety impact of hazardous. Advising applicants to provide key safety indicators in the ICA is beyond the scope of this policy.</p>

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8.	<p>Comment on Page 2, Section “Current Regulatory and Advisory Material”:</p> <p>The introductory sentence refers to error capturing checks and tests in the context of §§25.1529 and 25.1729, and appendix H to part 25, although there is no explicit reference to these terms in the subject rules. This introductory sentence may be confusing.</p>	<p>The following amendments to the introductory sentence are proposed:</p> <p>“The regulations applicable to <u>establishing Instructions for Continued Airworthiness, including selecting error capturing post-maintenance</u> checks and tests, are §§ 25.1529 and 25.1729 and appendix H to part 25.”</p>	<p>We partially concur. We disagree with adding the term “error capturing” as discussed in Airbus comment 5 on page 6. However, we agree with incorporating the other part of the requested change and have done so.</p>
9.	<p>Comment on Page 2, Section “Current Regulatory and Advisory Material”:</p> <p>Although Airbus subscribes to FAA’s statement indicating that error capturing checks and tests are “inspections necessary to provide for the continued airworthiness of the airplane”, it is believed that referring to the section H25.3(b)(1) of appendix H to part 25 is misleading and confusing.</p> <p>It is misleading because it gives the impression that the establishment of error capturing checks and/or tests is required only in the context of scheduled maintenance, preventive maintenance, rebuilding, or alteration (matter covered by the section H25.3(b)(1)), and unscheduled maintenance, preventive maintenance, rebuilding, or alteration cannot generate failures, malfunctions, or defects</p>	<p>The following amendments to the paragraph referring to section H25.3(b)(1) are proposed:</p> <p>“<u>ICA are a documentation giving instructions and requirements for the maintenance, preventive maintenance, rebuilding, and/or alteration essential to the continued airworthiness of an aircraft, engine, or propeller. For example, Section H25.3(b)(1) of appendix H requires that</u> “the applicant must include an inspection program that includes the frequency and extent of the <i>inspections necessary to provide for the continued airworthiness of the airplane.</i>” This policy statement is based on the FAA’s conclusion that post-maintenance <u>error capturing</u> checks and tests are <u>essential to/necessary to provide for the continued airworthiness of the airplane.</u> “Inspections necessary to provide</p>	<p>We disagree with Airbus’ statement that referencing section H25.3(b)(1) implies that establishing checks is only necessary for scheduled maintenance. As discussed below, section H25.3(b)(4) also establishes authority for this policy in the context of unscheduled maintenance. The purpose of referencing section H25.3(b)(1) is to emphasize that establishment of such checks should be a routine element of providing instructions for scheduled maintenance. We also disagree with including the term “error capturing,” as discussed in Airbus comment 5 on page 6. We also disagree with rewording that last sentence because we deleted it in response to other comments.</p>

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	<p>endangering the safe operation of an aircraft if performed improperly or if improper materials are used. Experience demonstrates that scheduled and unscheduled tasks should be equally treated.</p> <p>It is confusing because it gives the impression that the other ICA (and therefore, the other sections of the appendix H to part 25) provide for something other than the continued airworthiness of the airplane.</p>	<p>for the continued airworthiness of the airplane.”</p>	
10.	<p>Comment on Page 2, Section “Current Regulatory and Advisory Material”:</p> <p>Although Airbus subscribes to FAA’s statement indicating that some procedural instructions for error capturing checks and tests to ensure that the airplane is airworthy may be found in general procedural instructions defined under section H25.3(b)(4) of appendix H to part 25, it is believed that referring to the section H25.3(b)(4) is misleading and confusing.</p> <p>It is misleading because it gives the impression that procedural instructions for error capturing checks and/or tests can only be of general nature (matter covered by the section H25.3(b)(4)), like procedural</p>	<p>The following amendments to the paragraph referring to section H25.3(b)(4) are proposed:</p> <p>“<u>ICA include procedural instructions. For example, S</u>section H25.3(b)(4) of appendix H requires that maintenance instructions include: “Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.” The FAA interprets these general procedural instructions as including <u>the</u> procedural instructions for post-maintenance <u>error capturing</u> checks and tests to ensure that the airplane is</p>	<p>It appears Airbus misunderstands the reference to “general” instructions in section H25.3(b)(4). The term, “general,” is used in the sense of “affecting or concerning all or most people places or things; widespread.” Contrary to Airbus’ comment, this does not mean that the instructions cannot be specific, as indicated by the examples provided in this section: “including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.” To be useful, each of these procedures must provide specific instructions. Similarly, the post-maintenance checks described in this policy statement should provide specific instructions, but are “general”</p>

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	<p>instructions for inspections to be applied after various tasks, and no procedural instructions for error capturing checks and/or tests specific to a task will ever be established (e.g. testing procedural instructions specific to a modification/repair of a component).</p> <p>It is confusing because it gives the impression that the other ICA (and therefore, the other sections of the appendix H to part 25) provide for specific procedural instructions only, without error capturing checks and/or tests.</p> <p>It is proposed to amend the paragraph referring to section H25.3(b)(4).</p>	airworthy.”	<p>because they would apply to all of an identified fleet of airplanes. To clarify, we now state that “The post-maintenance functional checks and tests discussed in this policy are consistent with the system testing required by section H25.3(b)(4).” However, we have not used the term error capturing as not all maintenance issues result from errors.</p>

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11.	<p>Comment on Page 2, Section “Relevant Past Practice”:</p> <p>It is considered misleading to associate the term “required maintenance tasks” with “the Maintenance Steering Group (MSG-3) process” in the first paragraph. Operators are not required to systematically revise the program established under FAR 121.367 (or equivalent) in accordance with MRBR revisions when such revisions are published.</p> <p>The emphasis put on systems maintenance gives the impression that this Policy Statement does not apply to maintenance, preventive maintenance, rebuilding, or alteration of structure.</p> <p>The statement “the FAA has no direct input on the selection of checks intended to prevent potential hazards” is considered questionable. For example, the FAA approves the Airworthiness Limitations Section that contains some tasks and associated procedures intended to prevent potential hazards (ref. section H25.4 of appendix H to part 25). Should the selection of checks be considered incomplete or inappropriate, Airbus expects the FAA would not approve these documents. CMR documents and the</p>	<p>The following amendments to the first paragraph of “Relevant Past Practice” are proposed:</p> <p>“The FAA has used <u>different rules and processes (e.g. section 25.571, section 25.1309, Advisory Circular (AC) 25-19A, Certification Maintenance Requirements, dated October 3, 2011, and the Maintenance Steering Group (MSG-3) process</u>) to identify required <u>mandatory and recommended</u> maintenance, <u>preventive maintenance, rebuilding, or alteration</u> tasks <u>and associated procedures</u> for transport category airplanes. However, the FAA has no direct input on the selection of <u>error capturing checks and/or tests</u> intended to prevent potential hazards.”</p>	<p>We partially concur. We disagree with using the term “error capturing” as discussed in Airbus comment 5 on page 6. We also disagree with including “different rules and process (e.g. section 25.571 and 25.1309)” as neither of these impacts post-maintenance functional checks or tests. Further, we have not included “preventive maintenance, rebuilding, or alteration” tasks because, in this section, it is not necessary, and it detracts from the main point of how maintenance tasks are selected.</p> <p>Although we have not used the exact wording requested, we have revised the first paragraph to address this and other comments. It now states:</p> <p>“The FAA and industry have used Advisory Circular (AC) <u>25-19A</u>, <i>Certification Maintenance Requirements</i>, dated October 3, 2011; and AC 121-22C, <i>Maintenance Review Boards, Maintenance Type Boards, OEM/TCH Recommended Maintenance Procedures</i>, dated August 27, 2012, which also refers to the <i>ATA MSG-3, Operator/Manufacturer Scheduled Maintenance Development</i> process to identify mandatory and recommended maintenance tasks for transport category airplanes. The FAA aircraft certification office (ACO) has oversight over the process for the development of maintenance activities and</p>

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	Maintenance Review Board Report are also approved by the FAA.		recommendations related to Certification Maintenance Requirements (CMRs) and reviews Maintenance Review Board (MRB) reports. The FAA has no explicit guidance on the selection of post-maintenance checks and/or tests intended to prevent potential hazards resulting from maintenance activity.
12.	<p>Comment on Page 2 , Section “Current Regulatory and Advisory Material” and to Page 2, Section “Relevant Past Practice”</p> <p>Airbus considers it necessary to make the difference between the intended tasks and the error capturing checks and/or tests. Both can be found in the AMM, but also in other ICA. Consistency is then required with Section “Relevant Past Practice.”</p>	<p>The following amendments to the second paragraph of Section “Relevant Past Practice” are proposed:</p> <p>“Selecting <u>error capturing</u> checks and/or tests and including them in airplane maintenance manuals (AMMs) <u>the ICA</u> is not a new practice. [...] These procedures should be followed after a part is replaced <u>a task is performed</u>. However, it does not provide direction on how to select the <u>error capturing</u> checks and/or tests.”</p>	<p>We partially concur. We disagree with using the term “error capturing” as discussed in Airbus comment 5 on page 6. However, we have incorporated the other requested changes.</p>

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13.	<p>Comment on Page 2, Section “Current Regulatory and Advisory Material.” and Section “Relevant Past Practice”</p> <p>For consistency with previous comments it is considered necessary to amend the third paragraph of Section “Relevant Past Practice”, page 2.</p>	<p>The following amendments to the third paragraph of “Relevant Past Practice” are proposed:</p> <p>“The intent of this proposed policy is to clarify that selecting appropriate post-maintenance <u>error capturing</u> checks and/or tests is part of the necessary instructions that should be provided to comply with sections <u>25.1529 and 25.1729 and H25.3(b)(1) and (4) and H25.5 of appendix H to part 25</u>. The existing regulations cited in this proposed policy (i.e., §§ 25.1529 and 25.1729 and sections H25.3(b)(4) and H25.5 appendix H to part 25) do not specifically require applicants to define <u>error capturing</u> checks and/or tests following maintenance. However, after reviewing several cases of unsafe conditions that occurred because maintenance <u>intended</u> tasks were executed incorrectly, the FAA has concluded that, to meet the intent of these part 25 regulations, applicants should identify necessary <u>error capturing</u> checks and/or tests and include if required by the defined process as a means of compliance with <u>appendix H to part 25</u>section H25.3(b)(1) and (4). The applicant should make selections using a process that considers the safety impact of</p>	<p>We partially concur. We disagree with using the term “error capturing” as discussed in Airbus comment 5 on page 6. Also, it is no longer necessary to call out “preventive maintenance, rebuilding, or alternation” because we have included those terms in the definition of “post-maintenance checks or tests.” However, we have incorporated the other requested changes.</p>

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		maintenance, <u>preventive maintenance, rebuilding, or alteration</u> (including potential errors) based on data in the FHA and/or SSA, <u>or other equivalent</u> analyses.”	
14.	<p>Comment on Page 3, Section “Background” and on Page 5, Section “Policy,” Para 2 “Best Practice”:</p> <p>It is stated that the “NTSB identified several problems with maintenance on a critical system that might have been prevented if checks and/or tests had been in place.”</p> <p>Organizations holding a Design Approval are not the only organizations developing maintenance, preventive maintenance, rebuilding, or alteration (e.g., FAR 121 operators may develop some repairs or alterations) that may require error capturing checks and/or tests. This raises the question on how ICA can uniformly inform operators and maintenance providers on critical attributes of systems and structure, including critical components.</p> <p>Although the appendix H to part 25 does not explicitly require the publication of such specific data, these items would help operators and maintenance providers in their respective activities to prevent an</p>	<p>Airbus proposes to add the following step in the Policy paragraph 2 Best practice:</p> <p>“<u>2.4 Publish the critical attributes of systems and structure, including the list of critical components.</u>”</p>	<p>We do not concur and have not changed the policy. This suggestions falls in line with key safety information (KSI) to alert whoever is performing maintenance of the system, subassembly, component, or part of its critical nature. KSI is being addressed by Commercial Aviation Safety Team (CAST) and others. We disagree with this comment because the requested change is outside the scope of this document. Providing guidelines for what constitutes criticality is still being discussed. Rather, we propose the use of the SSA process and information to determine where tests or checks should be included.</p>

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	<p>airplane from being returned to service in an unsafe condition, to report in-service occurrences, etc. They could also not be missed or disregarded by design service providers during the classification and the approval process of changes to type design.</p> <p>The application of an advanced, holistic, and structured approach would probably address many issues. The one developed in FAR 33.70(a) to (c) and detailed in the AC 33-70-1 implements a set of plans (engineering, manufacturing, in-service management) connected to each other: with regard to the service management plan, it defines processes for in-service maintenance (in a broad sense) such that the attributes required by the engineering plan will be maintained. These processes become part of the ICA.</p> <p>Critical attributes of a system or the structure could be defined as inherent characteristics that determine the capability of a system or the structure to achieve the airworthiness objectives set in the certification basis for failures, which could be major or more severe for systems, or catastrophic for structure.</p>		

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15.	<p>Comment on Page 3, Section “Background”:</p> <p>To ensure consistency with previous comments, Airbus would consider it necessary to amend Section “Background.”</p>	<p>The following amendments to the Background are proposed:</p> <p>“There have been several cases of unsafe conditions occurring because of maintenance issues. Some of these could have been detected by appropriate post-maintenance <u>error capturing</u> checks and/or tests.</p> <p>The FAA concluded that only specific <u>error capturing</u> checks and/or tests are necessary to ensure that maintenance, <u>preventive maintenance, rebuilding, or alteration</u> is performed correctly and that maintenance, <u>preventive maintenance, rebuilding, or alteration</u> has no detrimental effect on adjacent systems <u>or the structure</u>.</p> <p>In the interest of safety management, this proposed policy describes how applicants can develop specific processes for selecting <u>error capturing</u> checks and/or tests. [...] It does not describe specific <u>error capturing</u> checks and/or tests. [...] However, the criteria ensure that this process will involve safety data and applicant personnel who are knowledgeable in airplane-level system safety. [...] By following their processes, applicants will address maintenance errors and issues, and the FAA will ensure compliance with §§ 25.1529 and 25.1729</p>	<p>We partially concur. We agree with replacing “AMM” with “ICA” and adding the term “other equivalent analyses” in reference to SSAs. We also agree with replacing “airplane-level system safety” with “airplane safety.”</p> <p>However, we disagree with using the term “error capturing” as discussed in Airbus comment 5 on page 6. We also have not added “structures” because they are not directly addressed by this policy. See Airbus comment 6 on page 7.</p> <p>Also, it is no longer necessary to call out “preventive maintenance, rebuilding, or alternation” because we have included those terms in the definition of “post-maintenance checks or tests.”</p>

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		<p>and sections H25.3(b)(4) and H25.5 of appendix H <u>to part 25</u>.</p> <p>Several applicants currently have processes to select <u>error capturing</u> checks and/or tests that they include in their AMMs <u>ICA</u>. [...] Furthermore, some applicants do not use SSAs <u>or other equivalent analyses</u> for selecting <u>error capturing</u> tests or checks after maintenance, <u>preventive maintenance, rebuilding, or alteration</u> and all existing <u>error capturing</u> checks and tests may not adequately address all the safety issues that can result from a maintenance error.”</p>	

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16.	<p>Comment on Page 5, Section “Policy”: Airbus would consider it necessary to amend the Policy for consistency with previous comments.</p> <p>Further, Airbus believes that staying at airplane level to identify error capturing checks and/or tests is not enough. Some errors may be detected at component level (shop maintenance) but not once the component is fitted to the airplane: e.g., the incorrect installation of a u-joint in a high lift system gearbox may be detected before gearbox close-up. However, once the gearbox is fitted to the airplane, the on-wing checks/tests may in some cases not detect the defect. Such a defect will be detected at the next gearbox shop visit or at the time of failure (a contributor to the possibility of asymmetrical lift at take-off/landing).</p>	<p>The following amendments to the Policy are proposed:</p> <p>“This policy statement provides guidance for developing a process to establish post-maintenance <u>error capturing</u> checks and tests and include them in AMMs <u>ICA</u>.</p> <p>1 Process Development. As one means of complying with sections <u>25.1529 and 25.1729, and H25.3(b)(1) and (4)</u> of appendix H <u>to part 25</u>, each applicant should develop a process to identify appropriate airplane <u>or component</u> level checks and/or tests that verify the <u>structure /system/ component is in condition</u> to performs its intended function correctly after maintenance, <u>preventive maintenance, rebuilding, or alteration</u> (such as <u>modification/repair of the structure, rigging of flight controls, or removal and replacement of system components</u>). Each applicant should use this process and include the identified airplane level <u>error capturing</u> checks and/or tests in the ICA. The post maintenance <u>error capturing</u> test/check should:</p> <p>1.1 Ensure that the maintenance, <u>preventive maintenance, rebuilding, or</u></p>	<p>We partially concur. We agree with revising the policy as follows:</p> <ul style="list-style-type: none"> • Replacing “AMM” with “ICA” in the first referenced sentence. • Replacing “H25.3(b)(1) and (4)” with “appendix H to part 25” in the first sentence of paragraph 1. • Deleting “airplane-level” from paragraph 1. • Deleting “system” from paragraph 1.1. • Adding “preventive maintenance, rebuilding, or alteration” to paragraph 1. <p>However, we disagree with calling out “preventive maintenance, rebuilding, or alternation” in paragraph 1.1. It is no longer necessary because we added those terms to paragraph 1.</p> <p>We also disagree with using the term “error capturing” as discussed in Airbus comment 5 on page 6. Further, we disagree with adding “structures” to paragraph 1 because they are not directly addressed by this policy. See Airbus comment 6 on page 7.</p> <p>We have not incorporated “component” maintenance as requested. Requiring that this policy be applied to component shop</p>

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		<p><u>alteration</u> task would not inadvertently result in an unsafe system operating condition.</p> <p>1.2 Ensure that adjacent systems <u>or the structure</u> are not inadvertently affected.”</p>	<p>maintenance would be beyond the intended scope of this policy. This policy is intended to be used to show compliance with part 25 to support airplane certification. With respect to parts, components, subassemblies, or pre-installation assemblies, design approval holders (DAHs) provide drawing, performance, design, and interface specifications. Upon completion of the build or repair process, such equipment is subjected to acceptance test procedures that verify their performance, dimensions, and interfaces. Errors in manufacture or repair should be detected by these procedures. Indeed, the acceptance test procedures provide proof of the important characteristics for components, and only after these practices are components installed. Errors in the component or installation that impact safety should be detected during the post-maintenance checks or tests specified at the airplane level.</p> <p>The purpose of this policy is to detect airplane maintenance issues, not component/vendor manufacture issues. Additionally, repair shops or component manufacturers may not know which functions are critical to safety on an airplane.</p>

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17.	<p>Comment on Page 5, Section “Policy”: Airbus would consider it necessary to amend the Policy for consistency with previous comments.</p>	<p>The following amendments to the Policy paragraph 2 “Best practice” and paragraph 3 “Process Submission” are proposed:</p> <p>“2 Best Practice. The process should include the following steps:</p> <p>2.1 Identify any potential maintenance issues and errors that might result in a major or greater hazard <u>for systems or in a catastrophic hazard for structure</u> according to <u>the definitions given in AC 25.1309-1A</u> (or latest revision). The process should address any adjacent system(s) <u>and the structure</u> that might be affected by causing a functional failure of major or worse <u>for systems or catastrophic for structure</u>. For example, if the avionics wiring is disconnected to facilitate servicing the hydraulic system, a check and/or test may be required to ensure the avionics system functions properly after the hydraulic service.</p> <p>2.2 For these maintenance, <u>preventive maintenance, rebuilding, or alteration</u> tasks, include appropriate post-maintenance <u>error capturing</u> checks and/or tests to detect any of these issues and errors, including those that might</p>	<p>We partially concur. We agree with adding “the definitions given in” to paragraph 2.1.</p> <p>However, we disagree with making any other changes. See Airbus comment 5 on page 6 regarding “error capturing” and Airbus comment 6 on page 7 regarding “structure.” Also, because we did not include “structure” in this policy, we did not add the hazard category of “catastrophic for structure.” Further, calling out “preventive maintenance, rebuilding, or alternation” in paragraph 2.2 is not necessary because we added those terms to paragraph 1 of the policy.</p>

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		<p>affect adjacent systems.</p> <p>[...]</p> <p>3 Process Submission. During airplane certification, each applicant should obtain FAA concurrence with the process(es) used to identify appropriate post-maintenance error capturing checks and/or tests in demonstrating compliance with §§ 25.1529 and 25.1729.”</p>	
18.	<p>Comment on Page 5, Section “Policy”: By experience, for a given maintenance, preventive maintenance, rebuilding, or alteration task, more than one error capturing method can be implemented to detect failures, malfunctions, or defects. But sometimes, only one is reliable enough.</p> <p>Operators and maintenance providers should be notified when they can use alternative error capturing checks and/or tests, and when only one is appropriate. This is justified on the basis of the lessons learned advertised on FAA website indicate that “Certain key maintenance tasks should be identified, and emphasized in a manner that ensures required tasks are consistently and correctly accomplished”.</p>	<p>The following step in the Policy paragraph 2 Best practice is proposed: “<u>2.5 Indicate when some alternative error capturing checks and/or tests may be acceptable.</u>”</p>	<p>We do not concur and have not changed the policy. This policy requires a process that will determine where post-maintenance checks or tests should be included. It requires identification of appropriate tests or checks to detect such issues and errors. If there are alternatives, the DAH may include them as alternatives. This policy does not prohibit that.</p>

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	Airbus considers it necessary to amend and complement the Section “Policy”, “Best practice”.		
19.	Comment to Page 6, Section ”Conclusion”: For consistency with previous comments, amending Section “Conclusion” is considered necessary.	The following amendments to the “Conclusion” are proposed: “The FAA has concluded that it is necessary to provide guidance on procedures for post-maintenance error capturing <u>error capturing</u> checks and/or tests. This policy statement provides new guidance on the recommended steps to establish a process for identifying post-maintenance error capturing <u>error capturing</u> checks and/or tests and ensuring that they could be incorporated into the operator’s program. If other data were to be presented that demonstrated otherwise, the FAA might reconsider the intent and content of this policy.”	We do not concur and have not changed the policy as requested. As discussed in previous comments, we have not adopted the use of “error capturing.” See Airbus comment 5 on page 6.

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1.	<p>Page: 2, Section: Current Regulatory and Advisory Material, 4th paragraph</p> <p>The proposed text states:</p> <p><i>“Section H25.3(b)(1) of appendix H requires that ‘the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the airplane.’ This policy statement is based on the FAA’s conclusion that post-maintenance checks and tests are ‘inspections necessary to provide for the continued airworthiness of the airplane.’”</i> [highlight added]</p> <p>This statement is in conflict with recent approval received from the FAA’s Transport Airplane Directorate related to Critical Design Configuration Control Limitations (CDCCL) in fuel system Airworthiness Limitations (AWLs). The FAA concurred that the “return to service” checks were not required to be identified as CDCCLs. The maintenance steps of putting together the airplane were deemed sufficient to address the critical nature of the installations.</p> <p>If FAA elects not to delete the statement, then we ask that this policy specifically state that it does not invalidate previously approved means of compliance.</p>	<p>We request that the last sentence of the paragraph be deleted.</p>	<p>For reasons stated in response to Airbus’ comment on this paragraph, we do not concur and have not changed the policy. The highlighted statement does not conflict with any recent findings by the FAA that “return to service” checks were not required to be identified as a CDCCLs. It is important to note that CDCCLs are one specific type of fuel tank system Airworthiness Limitation intended to protect safety-critical design features. They are located in the Airworthiness Limitations section of the Instructions for Continued Airworthiness. As specified in section H25.4(a)(2), other types of fuel tank system Airworthiness Limitations include mandatory replacement times, inspection intervals and related inspection procedures. A “return to service check” related to a CDCCL would be a “related inspection procedure” type of fuel tank system airworthiness limitation.</p>

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2.	<p>Page: 3, Section: Relevant Past Practice, 3rd paragraph</p> <p>The proposed text states:</p> <p><i>“The intent of this proposed policy is to clarify that selecting appropriate post-maintenance checks and/or tests is part of the necessary instructions that should be provided to comply with sections H25.3(b)(1) and (4) and H25.5 of appendix H. The existing regulations cited in this proposed policy (i.e., §§ 25.1529 and 25.1729 and sections H25.3(b)(4) and H25.5) do not specifically require applicants to define checks and/or tests following maintenance. However, after reviewing several cases of unsafe conditions that occurred because maintenance tasks were executed incorrectly, the FAA has concluded that, to meet the intent of these part 25 regulations, applicants should identify necessary checks and/or tests and include if required by the defined process as a means of compliance with section H25.3(b)(1) and (4).”</i></p> <p>As originally written, the proposed text clearly appears to be changing the regulations by expanding the “intent” of §§25.1529, 25.1729, H25.3(b)(4), and H25.5. As we understand it, and as stated in the proposed policy itself, the purpose of policy statements is neither to expand the intent of regulations nor to levy</p>	<p>We recommend revising the paragraph to read as follows:</p> <p><i>“The intent of this proposed policy is to clarify that selecting appropriate post-maintenance checks and/or tests is part of the necessary <u>for the safe operation of aircraft instructions that should be provided to comply with sections H25.3(b)(1) and (4) and H25.5 of appendix H. The existing regulations cited in this proposed policy (i.e., §§ 25.1529 and 25.1729 and sections H25.3(b)(4) and H25.5) do not specifically require applicants to define checks and/or tests following maintenance. However, a</u>After reviewing several cases of unsafe conditions that occurred because maintenance tasks were executed incorrectly, the FAA has concluded that, to meet the intent of these part 25 regulations, applicants should identify necessary checks and/or tests and include if required by the defined process as a means of compliance with section H25.3(b)(1) and (4). <u>through a process that considers system safety assessment (SSA) and functional hazard assessment (FHA) analyses, and that these checks and/or tests be performed prior to return</u></i></p>	<p>We disagree that this policy circumvents the rulemaking process and have not changed the policy as requested. Boeing is incorrect that this policy is “expanding the ‘intent’” of current regulations. A review of the regulatory history of these regulations demonstrates that the FAA’s intent in adopting them was to ensure that operators were provided with “comprehensive” instructions for maintaining their aircraft:</p> <p>...the FAA has found that the recommended maintenance procedures made available under current regulations are frequently inadequate in scope and content, and often do not provide a sound basis for the operator/owner to maintain the airworthiness of the aircraft.... those required to establish a [continuous airworthiness] program will benefit from the more detailed and comprehensive instructions made available to them under Sec. 21.50(b).</p> <p>To the extent the DAHs in the past have not provided adequate instructions for post-maintenance tests and checks, they have not fulfilled the intent of these requirements. The objective of this policy is to remedy these deficiencies in the future.</p>

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	<p>new compliance requirements on applicants; that should be done only through the normal rulemaking process. New interpretations of regulations within original general rule intent should only be applied after public notice and procedure. We therefore request that FAA reconsider issuing this policy statement and, instead, use the rulemaking process to mandate any new requirements.</p> <p>Our concern is that FAA this policy can become <i>de facto</i> regulation that circumvents the rulemaking process, and is imposed on the industry without a safety justification or cost v. benefit analysis. This is, of course, in spite of explicit statements that policy is only one means of complying with the regulations, only provides guidance, and does not constitute a new regulation.</p>	<p><u>to service.</u></p>	<p>We have not included the words “for the safe operation of aircraft” as this section discusses the relevant past practice of complying with current rules, not the rationale behind them.</p> <p>Because these rules and appendix already contain requirements for this information, there is no need for new rulemaking. This policy standardizes a means to select post-maintenance functional checks or tests.</p> <p>Also, we agree to delete the phrase “if required by the defined process as a means of compliance with section H25.3(b)(1) and (4).” A more general reference to the applicable regulations is sufficient.</p>

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3.	<p>Page: 4, Section: Background, 7th paragraph</p> <p>The proposed text states:</p> <p><i>“... The only oversight action for aircraft certification offices (ACOs) is to ensure that the processes meet high-level safety criteria. ...”</i></p> <p>There is no definition provided as to what the mechanism for the ACO oversight would be. If a process does not <i>“meet high-level safety criteria,”</i> then what recourse does the FAA have? What recourse does that applicant have?</p> <p>Policy statements serve to give guidance or acceptable practices on how to find compliance with a specific regulation; they are explanatory and not mandated. However, the proposed policy would require that applicants develop a new process. Unless it is mandated elsewhere by regulation, we question the appropriateness of this requirement via a policy statement. If it <u>is</u> mandated by regulation, then we ask that FAA provide references to the documentation that requires this process.</p>	<p>We recommend deleting this sentence.</p>	<p>As discussed previously, we disagree with Boeing’s assertion that there is no regulatory basis for this policy. This policy statement provides guidance on means of compliance with §§ 25.1529 and 25.1729 and appendix H to part 25, as referenced in the policy statement. The ACO’s role is to determine, with the assistance of AEG, that an applicant’s proposed ICA contain comprehensive instructions, including those provided for post-maintenance tests and checks. However, since the purpose of this policy statement is to provide guidance to the public, we have deleted this sentence.</p>

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4.	<p>Page: 4, Section: Background, 7th paragraph</p> <p>The proposed text states:</p> <p><i>“... By following their processes, applicants will address maintenance errors and issues, and the FAA will ensure compliance with §§ 25.1529 and 25.1729 and sections H25.3(b)(4) and H25.5 of appendix H.”</i></p> <p>We agree that, in certain situations, post-maintenance checks and/or tests are advantageous and will detect maintenance errors and issues. We do not agree with the use of an FAA policy statement to alter the intent of the regulations or levy new compliance requirements, as the proposed policy would undoubtedly do.</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“... By following their processes, applicants will <u>be better equipped to detect and address</u> maintenance errors and issues, and the FAA will ensure compliance with §§ 25.1529 and 25.1729 and sections H25.3(b)(4) and H25.5 of appendix H.”</i></p>	<p>We do not concur and have not changed the policy as requested. See Boeing comment 2 starting on page 25.</p>

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5.	<p>Page: 5, Section: Policy, Paragraph: 2.1</p> <p>The proposed text states:</p> <p><i>“2.1. Identify any potential maintenance issues and errors that might result in a major or greater hazard ...”</i></p> <p>There are many potential issues in attempting to implement the FAA’s proposed request to account for <i>“any potential maintenance issues and errors”</i>:</p> <ul style="list-style-type: none"> • Applicants do not share among themselves the data that would allow quantifiable analysis of maintenance errors. • Applicants who produce Aircraft Maintenance Manuals (AMM) would need substantially more information about maintenance tasks and the possible maintenance errors prior to designing the parts, which, in general, is done before the maintenance tasks are written. • Changing an OEM’s design of product and design of support processes will require a substantial amount of effort and resources. It is not something that would be easily or quickly done. It would take a significant effort – in terms of research, personnel, work hours, and other 	<p>We request that FAA delete entirely the requirement to have the applicants include within their maintenance recommendations an evaluation of the potential errors caused by operators or their airplane maintenance technicians.</p>	<p>We partially concur and have revised paragraph 2.1. Rather than focusing on potential errors that could cause problems, the policy addresses functional failures of systems that could be hazardous, regardless of cause. So only a system functional hazard assessment is necessary, and major failures are no longer covered. This also addresses concerns about the amount of effort and resources required. If Boeing were to change a maintenance procedure, under this policy, they might have to reanalyze the potential failures that might result. However, that is consistent with the purpose of this policy, which is to ensure that necessary post-maintenance tests and checks are provided. In most cases, any maintenance changes will have a small effect on required post maintenance checks.</p>

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	<p>resources -- to continue to show that <u>any</u> potential maintenance issues and errors are accounted for with each change to a task.</p> <ul style="list-style-type: none"> As an example, in Boeing's specific case, if the proposed policy is put in place and the requirement is now levied on Boeing to supply proof through the ICA process that any change to a task in the airplane maintenance data has undergone a SSA or FHA, then every major system on each airplane model would need to be reanalyzed and to a greater detail than is currently done. We would need to contact, or have in-house, personnel trained and capable of performing those tasks for every system on the airplane. The personnel would also need to understand how mechanics, operators, repair facilities, and aviation maintenance organizations use the maintenance documentation. Organizations that use the Boeing maintenance data are not required to report all maintenance issues and mechanic errors to either Boeing or the FAA. Without that data, Boeing would have to guess or analyze to the worst case scenario, taking into account all possible combinations that would produce the 		

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	<p>failure conditions specified. This process would be overly burdensome, untenable, and impracticable.</p> <ul style="list-style-type: none"> • AMMs are written to a certain level of mechanic knowledge. Neither the mechanic nor the quality inspector noted in the example used in the proposed policy statement exhibited that level of knowledge and yet they continued to perform maintenance. AMMs written to account for all levels of mechanics would be unusable to the majority of the mechanics. Personal and professional ethics must play a role in aviation maintenance. <p>In light of this, we request that FAA delete this requirement as stated in the proposed policy.</p>		

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6.	<p>Page: 5, Section: Policy, Paragraph: 3. The proposed text states:</p> <p><i>“3. Process Submission. During airplane certification, each applicant should obtain FAA concurrence with the process(es) used to identify appropriate post-maintenance checks and/or tests in demonstrating compliance with §§ 25.1529 and 25.1729.”</i></p> <p>As we understand it, and as stated in the proposal itself, a policy statement does not constitute a new regulation. Applicants currently have no regulatory requirement to create or submit a post-maintenance analysis process to the FAA for concurrence. On page 4, of the proposed policy (7th paragraph in the Background section), the proposed text states:</p> <p><i>“The only oversight action for aircraft certification offices (ACOs) is to ensure that the processes meet high-level safety criteria.”</i></p> <p>It is not clear which FAA office would provide concurrence or how the review/concurrence process would take place. Further, what recourse does the applicant have (or does FAA have) if FAA does not provide concurrence? We request that this be clarified.</p>	<p>We recommend either deleting this paragraph or changing it to be clearer as to its intent.</p>	<p>We concur with clarifying the intent of the paragraph. We have changed the policy to state that the applicant should submit the process to, and obtain concurrence from, the applicable ACO, or other appropriate delegated oversight office.</p> <p>This policy provides a means of compliance. We agree that there is nothing in the regulations requiring an applicant to submit this process to the FAA, just as there is no regulatory requirement to submit certification plans generally. However, the lack of uniformity and standardization to comply with the regulatory basis is not only a standardization issue, it is also a safety issue. The FAA believes that if a manufacturer creates and uses its own process to address the issue, it will be the most efficient and least burdensome way to address compliance.</p> <p>Submission of the process should be coordinated with the certification oversight office. The process will be evaluated against the policy contained in this policy statement. The ACO, or other appropriate certification oversight office, will review the process and, if acceptable, provide concurrence. If the FAA does not concur with the process submitted, it will provide feedback to the applicant and work with them to resolve the</p>

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			identified concerns. This would be similar to the approach used to resolve FAA concerns with certification plans or certification data submitted by an applicant.
7.	<p>Page: 3, Section: Background, 2nd paragraph</p> <p>The proposed text states:</p> <p><i>“The NTSB identified several problems with maintenance on a critical system that might have been prevented if checks and/or tests had been in place. ...”</i></p> <p>The proposed text gives the impression that there was no check of the system after rigging. However, the procedure did have a check (step u.), but the mechanic and the quality inspector chose to skip that step.</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“The NTSB identified several problems with maintenance on a critical system that might have been prevented if <u>steps were not skipped and more detailed checks and/or tests had been in place.</u>” ...</i></p>	<p>We concur and have added the suggested wording. In addition, we have added text to the document to more fully characterize the situation. We also added another example to more fully illustrate the need for appropriate post-maintenance functional checks or tests.</p>
8.	<p>Page: 3, Section: Background, 5th paragraph</p> <p>The proposed text states:</p> <p><i>“The maintenance crew did not follow the rigging procedure as written, and they missed a critical step that would have likely resulted in detecting the incorrect rigging and preventing the accident.”</i></p> <p>In accordance with the NTSB aircraft accident report, the maintenance crew did not <u>miss</u> the step; they chose to <u>skip</u> the step. Since the stated intent of the proposed policy is to</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“The maintenance crew did not follow the rigging procedure as written, and they missed <u>skipped</u> a critical step that would have likely resulted in detecting the incorrect rigging and preventing the accident.”</i></p>	<p>We concur. We have changed the wording as suggested and rewritten the section to more clearly characterize what happened. Additionally, embedded tests and checks are acceptable if they achieve this policy’s objectives.</p>

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	explain why post-maintenance checks and/or tests must be included, a more specific description of errors and omissions made in the field is appropriate. If the FAA is asking for separate, stand-alone post-maintenance checks, as opposed to embedded checks, then we request that it must be made clear why the embedded checks and/or tests are not acceptable.		
9.	<p>Page: 4, Section: Background, 6th paragraph</p> <p>The proposed text states:</p> <p><i>“... However, the FAA also determined that complete system functional tests are not necessary after every maintenance task. The FAA concluded that only specific checks and/or tests are necessary to ensure that maintenance is performed correctly and that maintenance has no detrimental effect on adjacent systems.”</i></p> <p>In theory, the FAA position is correct. In practice, however, it would be difficult to define an airplane-level system check and/or test for every maintenance task the airlines could perform that would take into account any possible maintenance issue or error. We currently reference Adjustment/Test tasks in some installation tasks to check for correct installation. The referenced task can contain</p>	<p>If the FAA has already determined the checks and/or tests that are needed, then we request they list them.</p>	<p>We partially concur. We disagree with listing the checks/tests because the FAA has not determined all checks and tests that are needed after a specific maintenance task. Rather, we have shown the need for post-maintenance checks and tests and provided a way for the DAH to create a process to select them. Post-maintenance checks and tests are dependent on the airplane design and will be different for each airplane. Further, post-maintenance checks and tests should be established for each system on the airplane.</p> <p>However, we have revised paragraph 2.3 of the policy to clarify that the manufacturer has the flexibility to require a complete set of post-maintenance functional checks and tests after any task or subtask, rather than providing only a required subset of checks and tests. The DAH is still responsible for</p>

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	<p>several tests or a test where the mechanic must go to the appropriate section of the test. It is difficult to write tests and checks to account for all situations that would occur during any task.</p> <p>If all airlines only did the scheduled maintenance, the post-maintenance functional checks could be created and bundled to address the work done during the maintenance interval. It will be difficult to create airplane-level functional checks that are specific to only the unscheduled maintenance being performed, especially if the airline is only performing one task at a time.</p> <p>The complexity of relating specific parts of the functional tests or targeted checks to each maintenance task could inadvertently increase non-compliance among those trying to follow the tasks.</p>		<p>ensuring that the complete set of checks or tests meet this policy for every system. For example, after adjusting the cable tension, re-rigging the flight data recorder (FDR) sensor might not be necessary. However, even though it might be adequate to verify full nose up and nose down elevator are available using a column sweep, the manufacturer may state that all system post-maintenance checks or tests should be performed (including re-rigging the FDR sensor). The manufacturer is still responsible for ensuring the adequacy of the complete functional checks and tests for each system. Note, requiring a complete functional test is part of the NTSB recommendation A-04-007.</p> <p>The comment addressed difficulty in addressing unscheduled maintenance. Relative to unscheduled maintenance, if the manufacturer believes it cannot adequately address all situations, then it might need to refer to a complete functional test or a large segment. We do not believe this should lead to non-compliance.</p>

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10.	<p>Page: 4, Section: Background, 7th paragraph</p> <p>The proposed text states:</p> <p><i>“In the interest of safety management, this proposed policy describes how applicants can develop specific processes for selecting checks and/or tests. It does not give applicants specific processes or identify specific systems. It does not describe specific checks and/or tests. It only provides high-level safety criteria that should be included in the processes that the applicants develop. However, the criteria ensure that this process will involve safety data and applicant personnel who are knowledgeable in airplane-level system safety.”</i></p> <p>Giving a set of criteria is different from describing how to develop a process. There is nothing in the proposed policy statement that describes how to develop the process, only what questions must be answered or what objective evidence must be provided.</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“<u>In the interest of safety management, this proposed policy describes how applicants can develop specific processes for selecting checks and/or tests criteria for a process to select appropriate post-maintenance checks and/or tests that will be included in the applicants’ Instructions for Continued Airworthiness (ICA). This policy does not describe how applicants can develop specific processes for selecting checks and/or tests. It does not give applicants specific processes, or identify nor does it identify specific systems or It does not describe specific checks and/or tests. It only provides high level safety criteria that should be included in the processes that the applicants develop. However, These criteria ensure that this-the applicants’ process will involve both safety data and applicant personnel who are knowledgeable in airplane-level system safety.</u>”</i></p>	<p>We do not concur. Instead, we deleted this section based on other comments.</p>

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11.	<p>Page: 5, Section: Policy, Paragraph: 1</p> <p>The proposed text states:</p> <p><i>“1. Process Development. As one means of complying with section H25.3(b)(1) and (4) of appendix H, each applicant should develop a process to identify appropriate airplane-level checks and/or tests that verify the system performs its intended function correctly after maintenance (such as rigging of flight controls, or removal and replacement of system components).”</i></p> <p>Our suggested addition of the phrase <i>“which uses SSA and FSA methods and data,”</i> clearly states what the rest of the policy states.</p> <p>However, there is currently no FAA oversight requirement that necessitates such a process; this would require a change to the regulations.</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“1. Process Development. As one means of complying with section H25.3(b)(1) and (4) of appendix H, <u>Each applicant should develop a process, which uses SSA and FSA methods and data,</u> to identify appropriate airplane-level checks and/or tests that verify the system performs its intended function correctly after maintenance (such as rigging of flight controls, or removal and replacement of system components).”</i></p>	<p>We partially concur. We disagree with deleting regulatory references because, as stated earlier, we have concluded that there is a regulatory basis to this policy. However, we have replaced the reference to “section H25.3(b)(1) and (4)” with “§§ 25.1529 and 25.1729 and appendix H to part 25.” We agree that adding the statement like “using data from the SSA” will improve the policy. Please note that we omitted reference to “FSA” methods and data because they are part of the SSA.</p>

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12.	<p>Page: 5, Section: Policy, Paragraph: 2.3</p> <p>The proposed text states:</p> <p><i>“Ensure that these selected checks and/or tests reliably detect incorrect system operation that can result in a major or worse hazard to the airplane.”</i></p> <p>Advisory Circular (AC) 25.1309-1A, <i>System Design and Analysis</i>, dated June 21, 1988, defines three failure conditions. AC 25-19A, <i>Certification Maintenance Requirements</i>, dated October 3, 2011, expands those to four. CMRs are created for safety-significant latent failures that would, in combination with one or more other specific failures or events, result in a hazardous or catastrophic failure condition. The work statement associated with CMR analysis is significant. Expanding that work statement to look at all maintenance tasks and to analyze those tasks to greater level of safety than the CMRs would be substantial in terms of efforts and resources.</p> <p>To do an airplane-level analysis of each system in order to find all failure conditions, major or worse, related to an improperly functioning system, subsystem, unit, or component, and mis-installation, incorrect execution of maintenance instruction, etc., would take tremendous amounts of resources</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“Ensure that these selected checks and/or tests reliably detect incorrect system operation that can result in a major <u>[as defined by AC 25.1309-1A (or latest version applicable), paragraph 6.h.(2)(ii)]</u> or worse hazard to the airplane.”</i></p>	<p>We disagree because we have deleted that sentence in response to another comment.</p>

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	(time and personnel) on the part of both the manufacturers and the airlines. Design Approval Holders would require information from the airlines that they have (rightly so) not been willing to supply.		
13.	<p>Page: 1, Section: Definition of Key Terms, 1st paragraph</p> <p>The proposed text states:</p> <p><i>“As used in this proposed policy, ‘check’ and ‘tests’ are generic terms for the tests and/or checks that should be conducted after performing maintenance procedures.”</i></p> <p>For consistency throughout the document, the terminology in this paragraph should reflect <i>“checks and/or tests,”</i> in lieu of “tests and/or checks.”</p>	<p>Revise the text to read as follows:</p> <p><i>“As used in this proposed policy, ‘checks’ and ‘tests’ are generic terms for the tests and/or checks checks and/or tests that should be conducted after performing maintenance procedures.”</i></p>	<p>We concur with the comment, but did not make the requested change because this sentence was deleted in response to another commenter.</p>

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14.	<p>Page: 2, Section: Current Regulatory and Advisory Material, 5th paragraph</p> <p>The proposed text states:</p> <p><i>“... Additionally, the FAA released Order 8110.54A, Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents, October 23, 2010, that includes instructions to include appropriate tests after maintenance.”</i></p> <p>Order 8110.54A, page 15, Chapter 4, paragraph 4.a.(6), implies “checks and/or tests” in the statement that reads:</p> <p><i>“Descriptions of how to adjust and test the systems; including flight control systems functional checkout procedures after maintenance, and any required equipment and precautions to be taken; ...”</i></p>	<p>We recommend that the text be revised to read as follows:</p> <p><i>“... Additionally, the FAA released Order 8110.54A, Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents, October 23, 2010, that includes instructions to include appropriate <u>checks and/or tests</u> after maintenance.”</i></p>	<p>We partially concur. Instead, we revised it to state “...appropriate checks and tests...”</p>

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15.	<p>Page: 2, Section: Relevant Past Practice, 1st paragraph</p> <p>The proposed text states:</p> <p><i>“The FAA has used Advisory Circular (AC) 25-19A, Certification Maintenance Requirements, dated October 3, 2011, and the Maintenance Steering Group (MSG-3) process to identify required maintenance tasks for transport category airplanes. However, the FAA has no direct input on the selection of checks intended to prevent potential hazards.”</i></p> <p>Our first suggested added sentence clarifies the existing role of the FAA in the process of defining required maintenance. They oversee the process and approve the resulting documents, but do not dictate which maintenance tasks are required to support the continued airworthiness of the aircraft.</p> <p>We maintain that the focus of CMR required by AC 25-19A is on tasks, not just checks. The sentence should be changed to increase readability of the policy and to clarify that the tasks required by CMRs may be more than inspections, checks, or tests.</p> <p>Changing the last sentence to include the role of the Authorized Representatives (AR) provides recognition that the FAA does have input into the selection of the check through</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“The FAA has used Advisory Circular (AC) 25 19A, Certification Maintenance Requirements, dated October 3, 2011, and the Maintenance Steering Group (MSG-3) process to identify required maintenance tasks for transport category airplanes. <u>The FAA (ACO) has oversight over the process for the development of maintenance activities and recommendations related to Certification Maintenance Requirements (CMR) and the Maintenance Review Board (MRB) reports. However, the FAA has no direct input on the selection of checks intended to prevent potential hazards. The only direct input that the FAA has into the selection of tasks (including checks and/or tests) to prevent potential hazards is through Authorized Representatives.</u>”</i></p>	<p>We do not concur with requested change. We revised this section based on other comments to more accurately characterize relevant past practices than the commenter’s proposed language.</p>

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	the ARs.		
16.	<p>Page: 4, Section: Background, 8th paragraph</p> <p>The proposed text states:</p> <p><i>“Furthermore, some applicants do not use SSAs for selecting tests or checks after maintenance, and all existing checks and tests may not adequately address all the safety issues that can result from a maintenance error.”</i></p> <p>Change the phrase to “<i>checks and/or tests</i>” to be consistent with the rest of the document.</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“Furthermore, some applicants do not use SSAs for selecting <u>checks and/or tests</u> or checks after maintenance, and all existing checks and/or tests may not adequately detect all the safety issues that can result from a maintenance error.</i></p>	<p>We concur and have changed the policy to “...checks and tests...”</p>

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17.	<p>Page: 4, Section: Background, 9th paragraph</p> <p>The proposed text states:</p> <p><i>“While the Flight Standards Service conducts certification and surveillance of aircraft maintenance and operational functions, the Aircraft Certification Service addresses maintenance functions as part of maintaining type design and ensuring the intent of associated certification requirements is met. It is important to analyze the impact of part, component, assembly, and system failures during the design and certification process. Aircraft Certification Service personnel perform airplane and system safety analyses and evaluate the safety impact of failures during the certification process.”</i></p> <p>The proposed paragraph implies that the Aircraft Certification Service personnel will be performing the analysis process. The rest of the policy states that the applicant will develop a process to do the analysis. To lay out responsibilities consistently in the document, our suggested rearrangement of the text is appropriate.</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“While the Flight Standards Service conducts certification and surveillance of aircraft maintenance and operational functions, the Aircraft Certification Service addresses maintenance functions as part of maintaining type design and ensuring the intent of associated certification requirements is met. It is important to analyze the impact of part, component, assembly, and system failures during the design and certification process. Aircraft Certification Service personnel perform airplane and system safety analyses and evaluate the safety impact of failures during the certification process. <u>It is important for applicants to analyze the impact of part, component, assembly, and system failures post-maintenance during the design and certification process</u>”</i></p>	<p>We partially concur. We rearranged the sentence as requested, except we replaced “...failures post-maintenance...” with “failures after maintenance.” We believe this phrase is clearer than the requested phrase.</p>

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Commenter: Boeing			
18.	<p>Page: 5, Section: Policy, 1st paragraph</p> <p>The proposed text states:</p> <p><i>“This policy statement provides guidance for developing a process to establish post-maintenance checks and tests and include them in AMMs.”</i></p> <p>Change the phrase to <i>“checks and/or tests”</i> to provide consistency with the rest of the document.</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“This policy statement provides guidance for developing a process to establish post-maintenance checks and/or tests and include them in AMMs.”</i></p>	<p>We partially concur. Instead, we have changed the policy to state “...to establish post-maintenance checks and test, as applicable, and....”</p>
19.	<p>Page: 5, Section: Policy, Paragraph: 2.1.</p> <p>The proposed text states:</p> <p><i>“... according to AC 25.1309-1A (or latest revision). ...”</i></p> <p>Different applicants and programs use different revisions of the AC. (Note: The Boeing Model 787 uses the “Arsenal” version of AC 25.1309.)</p>	<p>We recommend revising the text to read as follows:</p> <p><i>“...according to AC 25.1309-1A (or latest revision <u>in use for the application in question</u>).”</i></p>	<p>We do not concur because we deleted that sentence in response to another comment.</p>
20.	<p>Page: 5, Section: Policy, Paragraph: 2.1</p> <p>The proposed text states:</p> <p><i>“... The process should address any adjacent system(s) that might be affected by causing a functional failure of major or worse. ...”</i></p> <p>Paragraph 2.3 contains the wording that defines the level of failures, so it is not necessary in this paragraph.</p>	<p>We recommend the text be revised to read as follows:</p> <p><i>“... The process should address any adjacent system(s) that might be affected by causing a functional failure of major or worse <u>disturbed by maintenance</u>”</i></p>	<p>We do not concur because we deleted that sentence in response to another comment.</p>

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Commenter: Bombardier Aerospace			
1.	<p>The proposed Summary includes the following text:</p> <p><i>This policy describes the use of system safety assessment (SSA) and functional hazard assessment (FHA) data developed to show compliance with Title 14, Code of Federal Regulations (14 CFR) part 25 system certification rules to help determine where appropriate checks and/or tests are needed.</i></p> <p>The proposed policy intends to address any potential maintenance issue and errors that might result in a hazard level of major or higher. However, the proposed policy doesn't actually describe the use of SSA/FHA to determine the needed post-maintenance checks/tests.</p>	<p>Change text to:</p> <p><i>This policy describes recommends the use of system safety assessment (SSA) and functional hazard assessment (FHA) data...</i></p>	<p>We partially concur. We disagree making the requested change. However, we agree that the sentence should be clarified. We revised it to state:</p> <p>“This policy specifies that applicants should use system safety assessment (SSA) data developed....”</p>
2.	<p>The proposed Summary includes the following text:</p> <p><i>This proposed policy would provide criteria for determining when these checks and/or tests are appropriate.</i></p> <p>See previous comment. The proposed policy doesn't provide any criteria for determining if the check/test is appropriate.</p>	<p>Additional clarification and/or rework of the policy is needed to address check/test evaluation</p>	<p>We partially concur. We agree that there are no criteria for determining if the check/test is appropriate. That should be defined in the process developed by the applicant. However, the criteria for determining if checks and tests are needed are whether the maintenance error or issue could result in a functional failure having a hazard assessment of hazardous or catastrophic as defined in AC 25.1309-1A. This is discussed in the “Best Practices” section of the policy.</p> <p>We also agree that the sentence should be</p>

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			clarified. We revised it to state: “This policy provides criteria for determining when these checks and tests are appropriate (i.e., failure to perform them could result in hazard categories of hazardous or catastrophic as defined by AC 22.1309-1A).”
3.	In the section on ‘Relevant Past Practice’ it is stated that the FAA has no direct input on the selection of checks intended to prevent potential hazards. This statement is misleading since the FAA participates in the CMCC process, where it has an input in all CCMR-related discussions. In addition, the FAA approves the report that summarizes the disposition of all CCMRs.	Clarify to describe FAA involvement in CMCC process.	We concur. We clarified this point as requested. See Boeing comment 15 on page 41.
4.	Paragraph 2.1: <i>Identify any potential maintenance issues and errors that might result in a major or greater hazard according to AC 25.1309-1A (or latest revision).</i> Applicability of the policy should be limited to “major-severe.” This modification will remove from applicability of this Policy all “major” cases and will substantially decrease the number of potential post-maintenance tasks to be analyzed without jeopardizing aircraft safety.	Change text to: <i>Identify any potential maintenance issues and error that might result in a <u>major - severe</u> or greater catastrophic hazard according to AC 25.1309-1A (or latest revision). <u>This is equivalent to Hazardous or Catastrophic failure conditions according to the 25.1309 Arsenal Draft advisory material.</u></i>	We partially concur and have changed the policy to address hazardous or catastrophic failures as defined in 25.1309-1A. Note the industry terms hazardous and hazardous/severe-major represent the same hazard level.

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5.	<p>Paragraph 2.1:</p> <p><i>The process should address any adjacent system(s) that might be affected by causing a functional failure of major or worse.</i></p> <p>See previous comment on “major-severe.”</p>	<p>Change text to:</p> <p><i>The process should address any adjacent system(s) that might be affected by causing a functional failure of <u>major-severe</u> or worse <u>catastrophic (hazardous or catastrophic).</u></i></p>	<p>We do not concur and have not changed the policy as requested. See response to Bombardier comment 4 above.</p>
6.	<p>Paragraph 2.3:</p> <p><i>Ensure that these selected checks and/or tests reliably detect incorrect system operation that can result in a major or worse hazard to the airplane.</i></p> <p>See previous comment on “major-severe.”</p>	<p>Change text to:</p> <p><i>Ensure that these selected checks and/or tests reliably detect incorrect system operation that can result in a <u>major-severe</u> or worse <u>catastrophic hazard (hazardous or catastrophic hazard) to the airplane.</u></i></p>	<p>We disagree because we have deleted this sentence in response to other comments. Also, see response to Bombardier comment 4.</p>

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Commenter: General Aviation Manufacturers Association (GAMA)			
1.	<p><u>General Comments:</u></p> <p>GAMA agrees that the results of the system safety analysis process should be considered when developing the post maintenance checks and functional return to service testing. However, GAMA opposes the use of a policy change to introduce new interpretation of the requirements, as per FAA Order 8100.16, paragraph 2.2 a. Policy statements must not create or change the regulatory requirement as stated in the excerpt from the proposed policy - the excerpt from the proposed policy does just that:</p> <p><i>“The existing regulations cited in this proposed policy (i.e., §§ 25.1529 and 25.1729 and sections H25.3 (b) (4) and H25.5) do not specifically require applicants to define checks and/or tests following maintenance.”</i></p> <p>Therefore, GAMA recommends that the proposed policy be rescinded.</p>		<p>We do not concur and have not rescinded the proposed policy based on this comment. The FAA concludes that the regulatory basis cited in no way violates the FAA Order 8110.16. It does not create or change the regulatory requirement. It clarifies that these particular paragraphs have always covered return-to-service testing. However, the FAA is only now releasing policy on how this should be done.</p>

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Commenter: General Aviation Manufacturers Association (GAMA)			
	<p><u>Specific Comments:</u></p> <p>Further, GAMA question the overall application and intent of this policy and request clarification on the following specific issues:</p>		
2.	<p>Page 2, Paragraph 4: The FAA statement: <i>“This policy statement is based on the FAA’s conclusion that post-maintenance checks and tests are “inspections necessary to provide for the continued airworthiness of the airplane.”</i></p> <p>This implies that all previously FAA approved maintenance and inspection programs are no longer valid because if they did not include this new process, then the existing maintenance and inspection instructions do not provide for the required continued airworthiness for the airplane.</p>	<p>Further explanation is required regarding applicability of the proposed policy.</p>	<p>We do not concur and have not changed the policy as requested. The referenced statement does not imply that older programs are not valid. Rather, it states the FAA’s justification for concluding that post-maintenance checks/test should be in the ICA. The policy provides a standardized methodology to ensure compliance with respect to post-maintenance tests and checks. It also ensures the ICA for future airplanes will address the impact of maintenance errors to ensure airworthiness when returned to service.</p>

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3.	<p>Page 2, Paragraph 5: The FAA statement: <i>“Additionally, the FAA released Order 8110.54A, Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents, October 23, 2010, that includes instructions to include appropriate tests after maintenance”</i> is not applicable to Industry – Orders are intended for the instruction of FAA staff and inspectors.</p>	<p>Please remove or revise accordingly.</p>	<p>We do not concur and have not changed the policy as requested. We agree FAA orders are written for FAA, including FAA designees and delegated organizations; however, FAA policy is written for both industry and the FAA. In particular, Order 8110.54A tells FAA staff that airplane maintenance manuals should include, among other things, “Descriptions of how to adjust and test the systems; including flight control systems functional checkout procedures after maintenance, and any required equipment and precautions.” Though intended for the FAA, it is relevant advisory material; it contains material the FAA requires when reviewing maintenance instruction.</p>

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No.	Comment	Requested Change	Disposition
Commenter: General Aviation Manufacturers Association (GAMA)			
4.	<p>Page 3, Background: The FAA statement: <i>“There have been several cases of unsafe conditions occurring because of maintenance issues. Some of these could have been detected by appropriate post-maintenance checks and/or tests. For example, the Air Midwest Flight 5481 accident on January 8, 2003, is one. The National Transportation Safety Board (NTSB) determined that the probable cause of the accident was the airplane’s loss of pitch control during takeoff. The loss of pitch control resulted from multiple causes, including incorrect rigging of the elevator control system, as well as incorrect center of gravity.”</i></p> <p>The introduction of a new policy guidance will not prevent or cure poor adherence to and execution of existing maintenance procedures and policy for independent quality / safety inspection.</p>	<p>Please clarify the expectation of the proposed policy to reduce maintenance induced errors.</p> <p>If the FAA’s intent is to request Industry to develop or adopt a best practice standard for the implementation of Safety Risk Management (SRM), or similar process to be applied during the development of post-maintenance checks and tests to return an aircraft to service, then this should be executed using the appropriate forum or venue not via a policy.</p> <p>GAMA requests the FAA provide additional information on the development of the proposed new process, including sufficient guidance on the depth, content, and scope of said process to reduce the potential for ambiguity and variation during the review and audit process by FAA Inspectors.</p>	<p>We do not concur with adding additional guidance on developing the proposed process, including sufficient guidance on the depth, content, and scope of the process. The FAA believes that the policy provides adequate guidance. The applicant has the flexibility to develop the process as is suitable for its organization.</p> <p>The FAA has found that, to show compliance with § 25.1529 and appendix H to part 25, manufacturers must include post-maintenance functional tests based on safety analysis. The policy does not attempt to implement safety risk management. The FAA recognizes maintenance is often broken into tasks that may be done separately from a larger task or procedures. In this case, the manufacturer may include information for operators that requires a complete set of post-maintenance functional tests, or the manufacturer can identify for each task smaller sets of tests or checks that may be performed to ensure the airplane is returned to service in an airworthy condition. Therefore, performing post-maintenance checks and/or tests will not be at the mechanic’s discretion, but explicitly cited. Following this policy will ensure that the appropriate tests/checks are provided after each task. This policy may support a service repair manual, but that was not its purpose.</p>

DISPOSITION OF PUBLIC COMMENTS

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Prepared by [Robert C. Jones](#), ANM-112

No.	Comment	Requested Change	Disposition
Commenter: General Aviation Manufacturers Association (GAMA)			
5.	<p>Page 6, Implementation:</p> <p>This paragraph raises a number of questions regarding how the FAA foresees the application of the proposed process to follow-on retrofit installations (e.g., STCs performed by applicants other than the original aircraft OEM) and how the proposed policy is to be applied retrospectively to existing maintenance programs i.e. to be used to validate existing procedures and potentially update or modify them. This could potentially be an additional burden to the existing certification process.</p>	<p>Therefore, the FAA should clarify how this new process will be overseen; how adherence be verified, and by whom; and what would need to be documented as objective evidence by the applicant.</p>	<p>We do not concur. Paragraph 3 of the policy contains this information, which was clarified based on other comments. As provided in the Implementation paragraph, STC and amended TC applicants are expected to provide post-maintenance tests and checks using the guidelines in this policy for those areas that are significantly changed due to an STC or amended TC modification.</p>

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No.	Comment	Requested Change	Disposition
Commenter: Garmin			
1.	<p>General comment:</p> <p>Garmin agrees that the results of the safety analysis process should be considered when developing the post maintenance checks and functional return to service testing. However, the intent of this policy to formalize that process is potentially problematic. The policy does not provide sufficient guidance on the depth, content, and scope of the process thus leaving the applicant subject to potentially significant variations in what a FAA reviewer finds acceptable.</p>	<p>Provide sufficient guidance on the desired depth, content and scope of the process such that both the applicant and the FAA can expect consistent results.</p>	<p>We do not concur that additional guidance is necessary. This policy provides criteria that the DAH should include in its process. If the information provided to the oversight office meets these criteria, then concurrence may be found. The information provided to the FAA should be of such a nature to ensure that all airplane systems will be addressed by this policy.</p>
2.	<p>Policy paragraph 3 states that the process should be developed during the airplane certification and FAA concurrence should be obtained. It is not clear who in the FAA this refers to.</p>	<p>Clarify the intended FAA organization(s) (e.g., ACO, AEG, etc.) that are expected to provide concurrence.</p>	<p>We concur. We have changed paragraph 3 to state that the process should be provided to the appropriate aircraft certification office, or other appropriate delegated oversight office.</p>
3.	<p>The Policy seems to imply that this process would be created and concurred with during the initial aircraft certification. How does the FAA foresee this working for follow-on retrofit installations (e.g., STCs performed by applicants other than the original aircraft OEM)? Would this process be made available by the aircraft OEM? What about existing airplanes with existing maintenance programs; would this be required to be created to validate existing procedures or to</p>	<p>Clarify the intended application of this policy to situations other than the initial aircraft certification.</p>	<p>We do not concur. As stated in the Implementation paragraph, this policy also applies to amended TC and STC applicants. The FAA recognizes the concern in the comment about the need for this process from the OEM during an STC program. However, such direction is outside the scope of this document. The STC applicant may coordinate with the OEM or provide an independent process that address the STC post-maintenance checks and/or test</p>

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	Commenter: Garmin		
	modify them? That seems like an extremely expensive direction for existing airplanes.		selection.
4.	<p>The Policy requires the creation of a process; consequently, there is an implied requirement for the process to be followed. How will process adherence be verified and by whom? What would need to be documented as objective evidence by the applicant? Again, this seems like a very costly and time consuming process.</p> <p>It is Garmin’s opinion that guidance material outlining what should be considered during the creation of the maintenance checks and tests would have much more benefit to the industry as a whole without the added cost, complexity and oversight of a formal process.</p>	<p>It is Garmin’s recommendation that this policy should not be promulgated. Instead, new or improved guidance material should be created that outlines what should be considered during the creation of the maintenance checks and tests.</p>	<p>We do not concur. See Boeing comment 2 starting on page 25 for the regulatory basis for this policy. In the event that the FAA audits a DAH processes, the DAH should have adequate evidence to indicate they use the process. As processes may be different, FAA is not in a position to provide details as to what documentation should be retained.</p>

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No.	Comment	Requested Change	Disposition
Commenter: Gulfstream			
1.	<p>Current Regulatory and Advisory Material Section, Paragraph 4:</p> <p>“This policy statement is based on the FAA’s conclusion that post-maintenance checks and tests are “inspections necessary to provide for the continued airworthiness of the airplane.”</p> <p>– While this conclusion would seem to be warranted by the cited text in isolation, if taken in context of the full section of appendix H25.3(b)(1), the section clearly shows that this is not the intent of the rule.</p> <p>Section H25.3(b)(1) in its entirety is related to the determination of when maintenance is required to preserve airworthiness. The understanding of Gulfstream is that this section is not in any way related to post-maintenance actions, or even related to the content of the maintenance actions themselves.</p> <p>Furthermore, the text immediately preceding the quoted section states “... the frequency and extent of the inspections...”, which are not related to post-maintenance inspections, as these type inspections do not have a ‘frequency’ since they are performed every time the maintenance task is performed.</p>	<p>Gulfstream recommends revisiting the intent of Section H25.3(b)(1) with regard to post-maintenance checks and tests.</p> <p>The policy statement consists of new rulemaking, as the FAA “conclusion” referenced in the policy statement is not supported by the current rules as written.</p> <p>A policy statement is not the appropriate method to impose these changes.</p> <p>While the FAA's intent is clear and understood as provided in the Relevant Past Practice section, the cited sections of Appendix H do not in fact require any post-maintenance inspections or documentation of such.</p> <p>Gulfstream recommends the FAA initiate rulemaking activity to address this issue, and apply appropriate Special Condition Issue Papers where required until regulatory action is completed.</p>	<p>We do not concur. Gulfstream is correct that section H25.3(b)(1) addresses scheduled maintenance. One of the objectives of this policy statement is to emphasize that post-maintenance tests and checks are an essential element of scheduled maintenance and, in the context of scheduled maintenance, are “necessary to provide for the continued airworthiness of the airplane.” We disagree with the other parts of the comment. See Boeing comment 2 starting on page 25.</p>

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Commenter: Gulfstream			
2.	<p>Current Regulatory and Advisory Material Section, Paragraph 5:</p> <p>“Section H25.3(b)(4)...The FAA interprets these general procedural instructions as including procedural instructions for post-maintenance checks and tests to ensure that the airplane is airworthy”</p> <p>– Gulfstream notes after review of the cited text that this rule applies to general procedures that are used for a variety of maintenance activities such as those specifically cited as examples in the quoted H25.3(b)(4) text. This rule does not apply to specific post-maintenance inspections that may be used after specific maintenance activities have been performed.</p>	<p>Gulfstream recommends revisiting the intent of Section H25.3(b)(4) with regard to post-maintenance checks and tests.</p> <p>The policy statement consists of new rulemaking, as the FAA “interpretation” is not supported by the current rule as written.</p> <p>A policy statement is not the appropriate method to impose these changes.</p> <p>While the FAA’s intent is clear and understood as provided in the Relevant Past Practice section, the cited sections of Appendix H do not in fact require any post-maintenance inspections or documentation of such.</p> <p>Gulfstream recommends the FAA initiate rulemaking activity to address this issue, and apply appropriate Special Condition Issue Papers where required until regulatory action is completed.</p>	<p>We do not concur. We have not changed the policy as requested. See Airbus comment 10 on page 10 and Boeing comment 2 starting on page 25.</p>

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3.	<p>Current Regulatory and Advisory Material Section, Paragraph 5:</p> <p>“Additionally, the FAA released Order 8110.54A, <i>Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents</i>, October 23, 2010, that includes instructions to include appropriate tests after maintenance.”</p> <p>– Gulfstream would like to draw attention to FAA Order 8110.54A, which includes the following text in paragraph 4.a.(6):</p> <p>“4. Airplane / Rotorcraft Maintenance Instructions.</p> <p>a. These manuals and sections must include:</p> <p>(6) Descriptions of how to adjust and test the systems; including flight control systems functional checkout procedures after maintenance, and any required equipment and precautions;”</p> <p>FAA Orders are not regulatory in nature, and cannot be used as a basis to impose requirements on aircraft manufacturers.</p>	<p>The content of this policy statement consists in new rulemaking, therefore, a policy statement is not the appropriate method to make these changes.</p> <p>While the FAA's intent is clear and understood as provided in the Relevant Past Practice section, the cited sections of Appendix H do not in fact require any post-maintenance inspections or documentation of such.</p> <p>Gulfstream recommends the FAA initiate rulemaking activity to address this issue, and apply appropriate Special Condition Issue Papers where required until regulatory action is completed.</p>	<p>We do not concur. We have not changed the policy as requested. See Airbus comment 10 on page 10 and Boeing comment 2 starting on page 25. In addition, orders are not regulatory in nature. However, they have regulatory basis. The order is not the basis for this policy but is consistent with it.</p>

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4.	<p>Relevant Past Practice, Paragraph 4:</p> <p>“Note: Maintenance tasks may actually affect adjacent systems not being serviced (e.g., through gaining access). Another example, airplane washing has affected air data systems, which resulted in several accidents. Therefore, applicants may need to specify checks and/or tests for various tasks to ensure that safe operations of adjacent systems are not adversely affected.”</p> <p>– Gulfstream would like to point out that the existing safety assessment process should identify this type of issue when assessing maintenance error as a common cause factor for system failure.</p> <p>A complete zonal analysis would include such interference with nearby systems when assessing maintenance error.</p>		<p>We concur with the statement. We have provided this comment to FAA safety assessment branch. However, we have not changed the policy based on this comment because it is out of the scope of this policy and is related to other policy/guidance documents.</p>

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No.	Comment	Requested Change	Disposition
Commenter: Textron Aviation			
1.	<p>Page 2.</p> <p>While Cessna appreciates the intent of this policy in terms of addressing what is seen as a potential safety concern, we do have some comments on the specifics.</p> <p>“Section H25.3(b)(1) of appendix H requires that “the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the airplane.” This policy statement is based on the FAA’s conclusion that post-maintenance checks and tests are “inspections necessary to provide for the continued airworthiness of the airplane.”</p> <p>To arrive at the FAA’s conclusion (see highlighted text above) requires a completely new and different understanding of what the term “inspections” has meant for many years in the aviation industry. It is hard to follow the need or logic for such a change versus common usage of a term. Is there current FAA guidance defining “inspection” as including post-maintenance checks and tests?</p>	<p>Delete the claim that H25.3(b)(1) refers to post-maintenance checks and tests.</p>	<p>We do not concur. See Airbus comment 10 on page 10.</p>

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2.	<p>Page 3.</p> <p>“The maintenance crew did not follow the rigging procedure as written, and they missed a critical step that would have likely resulted in detecting the incorrect rigging and preventing the accident.”</p> <p>Is the claim here that an additional post-maintenance check or test would have detected what the maintenance crew missed in performing the action? In this particular case, it would seem ICA was adequate and met the intent of the rule but an individual failed to follow the instructions. Does an additional test really address this other than the simple math of redundancy (2x the instructions to miss or ignore?)? If this ICA was accepted under this amendment of the rule, can the FAA impose significant new requirements without rulemaking?</p>	<p>Please clarify how this policy is not, in effect, changing the rule?</p>	<p>We do not concur. We have not changed the policy as requested. We do not agree that this policy is in effect changing the rule. See Boeing comment 2 starting on page 25.</p> <p>Regarding Textron’s questions, we found that maintenance personnel were doing a partial procedure, and that this is a common practice. There was no specific set of checks or tests listed for cable tensioning. The mechanics used discretion in choosing the tests. We learned that, in some cases for subtasks, mechanics do not believe they are required to do all post-maintenance checks and tests. If the tests had been formally called out in the maintenance manual, the maintenance personnel might have performed these tests/checks with the rigor necessary to detect the incorrect rigging. The FAA interviewed a customer service engineer at a major aircraft manufacturer that explained they never expect a test/check after cable tensioning only. Maintenance is sometimes divided into segmented or distributed maintenance often on a night-by-night basis. There is a need to know which tests should follow each task including during out of sequence, troubleshooting, rebuilding, and alteration tasks.</p>

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3.	<p>Paragraph 1.1.</p> <p>“Ensure that the maintenance task would not inadvertently result in an unsafe system operating condition”</p> <p>Correctly performed maintenance task? One probable error? Two likely errors? Only those errors that would not be obvious at the conclusion of the task? What about mistakes obvious to the flight crew on normal preflight, start, and taxi?</p> <p>There has been much debate about the precise definition of “unsafe system operating condition” with regard to the system safety process. If the goal is to connect it to the current SSA type safety process, a direct, precise connection to failure condition hazard classification would be appreciated.</p>	<p>Clarify what bounds the endless human error spectrum for when to require checks and tests. We would suggest some possible criteria would be:</p> <ol style="list-style-type: none"> 1. If it is obvious in the normal course of completing the task (e.g. access panel cannot fit with the item installed the wrong way) that something is wrong, no check required. 2. If the flight crew should detect it using normal AFM procedures before takeoff (taking the runway for takeoff to be precise), no check required. 	<p>We concur. We have changed the policy as requested. To clarify the expectation, we have changed the policy to reflect that if maintenance can result in functional failures that result in hazardous or catastrophic conditions, then post-maintenance functional tests and checks should be selected. This new terminology should eliminate the notion that every possible human error must be considered and assessed.</p> <p>We understand that judgment is required in this process. For this reason, the policy provides flexibility to the manufacturer to define a process to meet the needs of their organization. The purpose of the policy is to detect issues and errors that might impact safety prior to returning the airplane to service. The policy addresses only checks and tests required to detect such failures after maintenance. If maintenance is done for only a small portion of the system, then either complete functional tests should be called out or appropriate tests should be specified based on this policy.</p>

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Commenter: Textron Aviation			
4.	<p>Paragraph 1.1.</p> <p>“Ensure that the maintenance task would not inadvertently result in an unsafe system operating condition”</p> <p>There has been much debate about the precise definition of “unsafe system operating condition” with regard to the system safety process. If the goal is to connect it to the current SSA type safety process, a direct, precise connection to failure condition hazard classification would be appreciated.</p>	<p>Please define the requirement in terms of what the system safety process outputs such as: if the result of the undetected maintenance error results in hazardous or catastrophic effects, there must be a post maintenance check or test.</p>	<p>We do not concur. We have not changed the policy as requested because the “Best Practice” section of the policy already provides this information.</p>
5.	<p>Paragraph 1.2.</p> <p>“Ensure that adjacent systems are not inadvertently affected.”</p> <p>While this seems straight forward, I am not sure it is clear what is intended. Is this simply referring to the literal adjacent system in terms of physical location? Or any system that could have been affected in the course of the maintenance action?</p>		<p>We do not agree that this needs to be clarified in paragraph 1.2. The applicant will be expected to assess any system that may be disturbed during maintenance. The text of the policy cites examples that illustrate the type of assessment that might be needed when an adjacent system is disturbed.</p>

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No.	Comment	Requested Change	Disposition
Commenter: Qantas			
1.		We believe Paragraph 2.1 of the Policy should be extended to cover emergency related systems and equipment because a SSA might not necessarily produce a major or greater hazard according to AC 25.1309-1A.	<p>We do not concur with expanding the scope of the policy to include emergency related systems and equipment. We have not changed the policy as requested.</p> <p>We considered this. However, latent failures are considered during the safety assessment process. If they are significant, then per transport airplane certification standards, they will be extremely improbable, and either monitored or periodically tested to ensure their proper function. Therefore, requiring a post-maintenance functional check for these types of maintenance issues is already addressed.</p>
2.	<p>Qantas notes the comments under “Effect of Policy” and “Implementation” that this does not constitute a regulation and would only be applicable to new applications for TCs, amended TCs, STCs and amended STCs.</p> <p>We believe that the intent of the policy is so important that it should be a regulation, perhaps under 25.1529, and that some amount of retrospectivity should be required.</p>		<p>We concur. Although, no change to this policy is necessary. After issuing this policy, we will consider the need and mechanism for addressing the existing fleet of transport airplanes. This policy is based on our determination that applicants have not always fully complied with the intent of § 25.1529 in the past. As with other non-compliance with airworthiness standards, if we determine that non-compliance results in an unsafe condition, our normal practice is to address such non-compliance through issuance of airworthiness directives.</p>

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3.	<p>If the application of the policy is limited to new applications for TCs, amended TCs, STCs and amended STCs on or after the effective date of the final policy then the policy will have little or no effect on aviation safety to help prevent accidents like the example of Flight 5481 cited in the Background section, until many years into the future.</p> <p>Particularly for emergency equipment, but also for any other potential maintenance issues and errors that might result in a major or greater hazard, Qantas believes that aviation safety would benefit significantly from enforcement of this proposed policy on holders of existing TCs and STCs and other design approval holders to the greatest extent possible.</p>		<p>We do not concur and did not revise the policy. This policy applies to future airplane certification programs only.</p>