

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

Primary Report and Recommendation	AD Compliance Review Team (Task 2), Recommendation 4, (Bullet 1, Part 2) Effective and Efficient AD Process, Later- Approved Parts, and new AWLs/Maintenance
Secondary Report and Recommendation	None
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Links to Other Working Groups	Service Information Working Group
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WORKING GROUP REVIEW OF ISSUE/PROBLEM

This Summary Paper addresses Part 2 of Recommendation 4, Bullet 1, to ensure that the Airworthiness Directive (AD) development process is effective and efficient and results in a compliant product for air carriers. **(Issue 1)**

Note that two additional recommendations are being addressed in this Summary Paper. For clarity, the recommendations will be labeled as Issues 1 (above), 2 and 3 (below), respectively.

In March 2010, the AD Development Working Group (ADWG) was tasked with an additional recommendation by the ARC; namely, “minimize the number of alternative methods of compliance (AMOC) for ADs that require design changes.” **(Issue 2)**

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

On September 15, 2010, the AD Implementation ARC assigned a new task to the ADWG concerning maintenance of design changes that are required by AD. The ARC asked the ADWG to consider including a section in ADs, and possibly the AD Manual, AD Worksheet, and/or AD Template, to address maintenance of mandatory design changes. **(Issue 3)**

Issue 1

The ADWG concluded that all of the improvements to the AD process brought forth through the ARC will contribute to a more effective and efficient AD process.

The recommended AD process improvements, in conjunction with the FAA's Quality Management System (QMS) will help ensure that the AD process is effective and efficient. AVS, the line of business within the FAA responsible for Aviation Safety, is an International Standards Organization (ISO) certified organization. As outlined in FAA Order 8100.5A, "Aircraft Certification Mission, Responsibilities, Relationships, and Programs," the Aircraft Certification (AIR) service within AVS is responsible for the determination and issuance of ADs.

AIR maintains its processes, in this case ADs, under the QMS to comply with ISO requirements. AIR documents processes related to the development of ADs and controls (through an Analysis of Data) those processes to ensure that they are suitable, adequate, and effective. This is accomplished by establishing and monitoring measures and metrics in line with the goals of the agency and objectives of the specific process and by evaluating trends and issues resulting from internal and external audits. The results of the oversight activity are evaluated for continual improvement.

While AD process improvements developed by the ARC will contribute to more effective and efficient AD processes, certain measures that could improve AD processes even further were considered unachievable within the ARC's schedule. The ARC considered multiple industry objectives, weighed them against FAA and industry resources, legal obligations, and many other factors, and ultimately compromised to reach consensus on several issues. For example, the ARC proposes to make service instructions less prescriptive by using the term "required for compliance" (RC) to identify specific steps that are required for AD compliance. This proposal is definitely considered a process improvement; however, some ARC members would prefer fewer RC steps be identified in service information. The criteria for determining RC steps is based on multiple factors, including resources.

Issue 2

The ADWG concluded that the end goal of the ARC's recommendation to minimize the number of AMOCs for ADs that require design changes is to allow use of "later approved parts" without the need for an AMOC. For example, if an AD requires replacement of a -1

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

part with a -2 part, and a -3 part is subsequently approved as an alternative to the -2 part, then the objective would be to develop a method that would permit use of the -3 part without the need of an AMOC.

Issue 3

The issue concerning maintenance of mandatory design changes was identified during FAA Organization-Procedures Working Group (FAAWG) discussions concerning Recommendation 12, involving proposed revisions to 14 Code of Federal Regulations (CFR) sections 39.7 and 39.9. The FAAWG identified 2 main issues in their Summary Paper on this subject:

1. *...the difference in regulatory treatment between an aircraft that has had design changes incorporated during production and an aircraft that has been modified in accordance with an AD to incorporate the same design change. In the first instance, the maintenance program can handle any deviations from the configuration under 14 CFR section 43.13, while in the latter instance, deviations must be handled through the AMOC process.*
2. *There were discussions of whether the product or article could return to the operator's maintenance program (i.e., be maintained or altered under part 43) after a terminating action was accomplished.*

Additional information on this issue can be located in the Summary Paper for Recommendation 12, under the headings, “Design Changes in Production Aircraft versus In-Service Aircraft” and “Maintenance after Terminating Action (“Post-Modification Maintenance”).

Issue 3 is also related to Recommendation 11, which states “Air carriers should develop best practices to address normal maintenance or other actions that could possibly de-modify an AD configuration...”. Addressing maintenance in future ADs, as proposed in Issue 3 of this summary paper, would clarify maintenance requirements for mandatory design changes and improve the ability of air carriers to avoid de-modifying those configurations.

REGULATIONS AND GUIDANCE IDENTIFIED FOR REVIEW

14 CFR sections 39.7, 39.9, and 43.13
AD Manual, FAA-IR-M-8040.1C
AD Worksheets and/or AD Templates
Transport Airplane Directorate's Analysis of Data (AOD) for ADs
Summary Paper for Recommendation 12

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

WORKING GROUP PROPOSAL TO ADDRESS THE RECOMMENDATION(S)/FINDING(S)

Issue 1

The Transport Airplane Directorate (TAD) will continue to review the measures used to evaluate the timeliness of AD processes, including the timeliness of processing AMOCs, and to oversee compliance to the process through regularly scheduled audits or assessments. As it moves towards establishing an internal safety management system (in support of continuous improvement), the TAD will provide increased focus on the required safety controls of the process, the relation of the process to the agency's safety goals and objectives, and control of the potential hazards associated with performing the process.

Issue 2

The ADWG proposes to allow “later approved parts” in the service information. The AD corrective action could then follow the service information and meet AD Friendly guidelines of minimizing differences between the AD and service information. The service information language would allow installation of Design Approval Holder (DAH) parts that are approved after the release date of the service information.

Issue 3

The ADWG **proposes** new AD text to address maintenance of design changes or repairs required by ADs that do not impose post-modification requirements ([such as post-modification repetitive inspections](#)). For these types of ADs, the new AD text is intended to:

- Require any new Airworthiness Limitations (AWL) that are needed to maintain the design change to ensure that the unsafe condition is not reintroduced (note that the SIWG is considering the process for identifying new AWLs).
- Allow certain aspects of the design change to be maintained using normal maintenance activities (i.e., acceptable methods, techniques, and practices).

Proposed new AD text to address these issues is included in Appendix A. This proposal depends on the development of new AWLs to protect safety critical configurations that are mandated by AD. The new AWLs will supplement 14 CFR part 25 Appendix H, *Instructions for Continued Airworthiness*, limitations to address maintenance of design changes required by AD. The new AWLs will apply to airplanes that incorporated the design change in production as well as airplanes that incorporated the design change in-service through AD compliance, which promotes standardization and addresses the FAAWG Issue 1 described above. FAAWG Issue 2 described above is addressed by the proposed new maintenance sections in Options 1 and 2 of Appendix A.

SUMMARY SHEET

Airworthiness Directive Implementation Aviation Rulemaking Committee

AD Development Working Group

AWLs are a subset of Instructions for Continued Airworthiness (ICA), reference 14 CFR 25 Appendix H. Traditional ICAs provide information essential to the continued airworthiness of products, which include methods, techniques and practices for performing maintenance, preventive maintenance and alterations. AWLs provide mandatory requirements and are considered part of the type design (reference 14 CFR section 21.31). Unlike most methods, techniques and practices for performing maintenance, preventive maintenance and alterations, AWLs cannot be changed without FAA approval.

If new AWLs are developed under this proposal and approved by the FAA, they would be mandatory for all operators and maintenance providers and would identify those actions that are required to prevent reintroduction of an unsafe condition addressed by a certain AD. The FAA currently relies on 14 CFR section 39.7 to ensure that configurations mandated by ADs are not changed without an AMOC. Under this proposal (Issue 3), the AWL would control ongoing maintenance, preventive maintenance or alteration activities.

Note: The Service Information Working Group (SIWG) has a related assignment to develop a process for determining appropriate AWLs for design changes required by ADs. The process should identify AWLs that are needed to protect safety-critical features in these designs and minimize the risk of changes to these designs through maintenance activities. The new AWL process should involve DAH proposals for AWLs during certification when AD-related design changes are proposed to the FAA, followed by FAA review and approval of the new AWLs as part of the amended type design.

ALTERNATIVES CONSIDERED

Two different alternatives, described below, were considered for Issue 2 (minimizing AMOCs for ADs requiring equipment or software replacement). No alternatives were considered for the other two issues.

The ADWG considered an option to limit the AD applicability to airplanes with the unsafe equipment or software installed. For example, the AD applicability would be Model xxx series airplanes with the -1 part installed. The AD would require replacement of the -1 part with a -2 part.

The ADWG did not recommend this option because the objective of the AD is, not only to have the unsafe part removed from airplanes on which it is currently installed, but also to prevent its installation on any other airplane where the part is eligible for installation. The FAA typically includes a “Parts Installation” paragraph in transport ADs (those that require parts replacements) to ensure that the unsafe part is not reintroduced in service. The applicability of the “Parts Installation” paragraph cannot be greater than the applicability of

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

the AD. Therefore, for the “Parts Installation” paragraph to have its intended effect, the applicability of the AD must cover all airplanes on which the parts are eligible for installation per the type design.

In the absence of a “Parts Installation” paragraph in an AD with broad applicability, no **process can guarantee with certainty** that the unsafe parts are not reintroduced in service. For the AD applicability proposed above (Model xxx with unsafe part yyy installed), the working group recognizes that if unsafe part yyy is installed on an airplane sometime after the effective date of the AD, the AD will apply to that airplane and the part must be removed per AD requirements. However, the issue involves visibility of the AD. Operators that do not have unsafe part yyy installed on the airplane on the effective date of the AD may treat the AD as not applicable.

Another alternative considered was to remove the unsafe part without any corrective action. The AD would require that the unsafe part is removed and replaced with a new or serviceable part. The new part would not be identified. The ADWG did not recommend this option because the AD would not include adequate information to ensure that the unsafe condition was not reintroduced. Also, without corrective action, any approved part could be installed including PMA and owner/operator produced parts. Note that the ADWG did agree that in certain situations this alternative may be acceptable. The example provided is when the unsafe part is related to a quality control problem that is well understood.

IMPLEMENTATION PLAN

Issue 1

A more efficient and effective AD process will result from the implementation of the recommendations set forth by the AD Compliance Review Team (AD CRT) by all of the working groups, and continued monitoring and oversight of the measures used to evaluate the timeliness and compliance with the AD process, including AMOC processes. Therefore, no additional implementation plans are anticipated for this issue.

Issue 2

The ADWG proposes transferring implementation of the “later approved parts” language in the service information to the SIWG with the following considerations:

- The decision whether “later approved parts” are acceptable without an AMOC should be considered on a case-by-case basis.
- Because operators may not have easy access to information concerning the date a part is approved, the ADWG recommends that the service information for the “later approved

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

parts” include some type of recognition that the part complies with the applicable AD. This will ensure operators know which parts are acceptable for installation per the AD.

- Recommend that service information include the following definition of “later approved parts:”

Design Approval Holder (DAH) design changes approved after the original issue or revision [X] of the service bulletin.

Issue 3

The ADWG and SIWG plan to issue an Advisory Circular focused on ARC DAH activities, with a section explaining the new AWL process (if accepted by the SIWG) and the proposed AD revisions regarding maintenance. The ADWG also plans to incorporate information on this subject in the AD worksheets and/or templates. This information will be taken from the 3 options provided in Appendix A. Due to the late assignment (Issue 3 was assigned to the ADWG and SIWG in September 2010) and ongoing SIWG activities associated with this issue, completion of these deliverables before June 30, 2011 may not be possible.

ASSUMPTIONS/CONSTRAINTS

Issue 1

While AD process improvements developed by the ARC will contribute to more effective and efficient AD processes, certain measures that could improve AD processes even further were considered unachievable within the ARC’s schedule. The ARC considered multiple industry objectives, weighed them against FAA and industry resources, legal obligations, and many other factors, and ultimately compromised to reach consensus on several issues. For example, the ARC proposes to make service instructions less prescriptive by using the term “required for compliance” (RC) to identify specific steps that are required for AD compliance. This proposal is definitely considered a process improvement; however, some ARC members would prefer fewer RC steps be identified in service information. The criteria for determining RC steps is based on multiple factors, including resources.

Issue 2

Unique provisions may be necessary in the service information for “later approved parts.” This will be determined by the FAA and DAH engineering on a case-by case basis.

Also, the proposal does not provide for parts associated with a supplemental type certificate (STC), Parts Manufacturer Approval (PMA), or owner/operator produced parts to be installed without an AMOC.

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

Issue 3

The process for developing new AWLs for AD-related design changes will be voluntary for DAHs. A significant limitation to the potential value of this process is that DAHs may not agree to develop new AWLs for these design changes (i.e., limitations related to the AD configuration that are not specifically addressed in 14 CFR part 25 Appendix H). In this case, the FAA will use Option 3 in Appendix A. Further, this process would have no effect on previously issued ADs.

FAA AND INDUSTRY TRAINING IDENTIFIED

N/A

ISSUES FOR WORKING GROUP CONSIDERATION

N/A

ISSUES FOR ARC CONSIDERATION

N/A

FINDING No. 4

The Team found systemic problems in the AD process as follows:

- Multiple ADs affecting airworthiness in the same area of the airplane resulting in overlapping and confusing mandates for air carriers. This can lead to inadvertent noncompliance or reversal of previous AD actions.
- Occasionally, the OEM's service instructions are not available when the AD NPRM is issued. In addition, copies of service instructions are not included in the Government's electronic regulatory docket system. In either case, this prevents air carriers from having the full comment period to comment on the specifics of the service document.
- ADs generally have an aggressive installation timeline. Because of the urgent nature of AD tasks and the need for planning to minimize aircraft out-of-service time, air carriers frequently accomplish service instructions ahead of the AD issuance date. This creates an exposure to noncompliance when there are changes in the final AD that differ from the originally released service document.

The Team noted that as part of a process improvement effort, in 2006 the FAA signed a working agreement with Boeing Commercial Airplanes on Agreed Principles and Practices for AD-friendly service bulletins related to the Boeing transport fleet. The agreement was

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

developed as part of a joint effort by the FAA and an OEM to identify and implement improvements to the format and quality of service instructions and ADs. The Team acknowledged that the joint effort is a major step in improving the FAA's AD process, provided that certain recommendations in section 2.2.2 regarding service instructions are incorporated to simplify air carrier implementation.

RECOMMENDATION NO. 4, (BULLET 1, PART 2)

The overarching goal is to ensure that the Airworthiness Directive (AD) development process is effective and efficient and results in a compliant product for air carriers.

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

APPENDIXES

Appendix A:

Sample text to address maintenance of modifications and repairs required in ADs that do not impose post-modification requirements ([such as post-modification repetitive inspections](#)).

Note that “maintain,” “repair,” and “alter” are used below in accordance with 14 CFR part 1 definitions.

Option 1: If AWLs are needed to prevent reintroduction of unsafe condition

(g) Required Modification or Repair

Maintenance

(h) Before or concurrently with doing the actions required by paragraph (g) of this AD: Revise the maintenance/inspection program by incorporating new airworthiness limitations (AWL) XXX, dated XXX. The inspection interval, if any, for these new AWLs starts on the date the replacement required by paragraph (g) of this AD is done.

(i) After accomplishing the actions required by paragraph (g), an AMOC approval is not required to maintain or alter the affected area as long as the AWLs required by paragraph (h) are followed.

Alternative Methods of Compliance (AMOCs)

(j) Standard paragraph on AMOCs

Option 2: If AWLs are not needed to prevent reintroduction of the unsafe condition

(g) Required Modification or Repair

Maintenance

(h) After accomplishing the actions required by paragraph (g), an AMOC approval is not required to maintain or alter the affected area.

Alternative Methods of Compliance (AMOCs)

(i) Standard paragraph on AMOCs

SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
AD Development Working Group

Option 3: If AWLs are needed to prevent reintroduction of the unsafe condition, and these limitations have not been approved by the FAA:

(g) Required Modification or Repair

Maintenance

Note: After accomplishing the actions required by paragraph (g), maintenance and/or preventive maintenance under 14 CFR part 43 is permitted provided the maintenance does not result in changing the AD-mandated configuration (reference 14 CFR 39.7).