Federal Aviation Administration
Aviation Rulemaking Advisory Committee

Transport Airplane and Engine Issue Area
Airworthiness Assurance Working Group

Task 7 – Multiple Complex Supplemental Type Certificate Modification

Task Assignment

[Federal Register: March 22, 2001 (Volume 66, Number 56)]
[Notices]
[Page 16089-16090]
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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee; Transport Airplane and Engine Issues--New Task

AGENCY: Federal Aviation Administration (**FAA**), DOT.

ACTION: Notice of new task assignment for the Aviation Rulemaking Advisory Committee (ARAC).

SUMMARY: The **FAA** assigned the Aviation Rulemaking Advisory Committee a new task to study the effects of multiple complex structural supplemental type certification (STC) modifications installed on transport category airplanes. The ARAC will develop a report with recommendations for a long-term plan addressing the effects of multiple complex STC modifications on the structural integrity and continued safe operations of transport category airplanes. This notice is to inform the public of this ARAC activity.

FOR FURTHER INFORMATION CONTACT: John McGraw, 1601 Lind Ave., Renton, Washington 98055-4056, 425-227-1171, john.mcgraw@**faa**.gov.

SUPPLEMENTARY INFORMATION:

Background

The **FAa** established an Aviation Rulemaking Advisory Committee to provide advice and recommendations to the **FAA** Administrator on the **FAA**'s rulemaking activities with respect to aviation-related issues.

The Task

Study the effects of multiple complex structural STC modifications installed on transport category airplanes. Develop a report with recommendations for a long term plan addressing the effects of multiple complex STC modifications on the structural integrity and continued safe operation of transport category airplanes, and the ability of the operators to accomplish mandatory **FAA** aging fleet programs.

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The report should identify the types of structural modifications considered to be complex STC modifications, and should propose recommended actions to be taken by the **FAA** to address the effects

complex structural STC modifications have on the structural integrity and continued safe operation of modified airplanes.

The report and recommendations should contain the following:

1. A description of **FAA** and industry actions necessary to identify the interaction effects of multiple complex STC modifications,

2. A description of **FAA** and industry actions that will address the effects that complex modifications have on aging aircraft issues, and

3. A description of **FAA** and industry actions necessary to address the effects that complex modifications have on **FAA** mandated airworthiness actions (i.e., airworthiness directives, aging aircraft programs).

Schedule: The report should be completed no later than September 28, 2002.

ARAC Acceptance of Tasks

ARAC accepted the task and assigned the task to the Airworthiness Assurance Working Group, Transport Airplane and Engine Issues. The working group will serve as staff to ARAC and assist in the analysis of the assigned task. ARAC must review and approve the working group's recommendations. If ARAC accepts the working group's recommendations, it will forward them to the **FAA**.

Working Group Activity

the Airworthiness Assurance Working Group is expected to comply with the procedures adopted by ARAC. As part of the procedures, the working group is expected to:

1. Recommend a work plan for completion of the task, including the rationale supporting such a plan for consideration at the next meeting of the ARAC on transport airplane and engine issues held following publication of this notice.

2. Give a detailed conceptual presentation of the proposed recommendations prior to proceeding with the work stated in item 3 below.

3. Draft the appropriate documents and required analyses and/or any other related materials or documents the working group determines to be appropriate.

4. Provide a status report at each meeting of the ARAC held to consider transport airplane and engine issues.

Participation in the Working Group

The Airworthiness Assurance Working Group will be composed of technical experts having an interest in the assigned task. A working group member need not be a representative or a member of the full committee.

An individual who has expertise in the subject matter and wishes to become a member of the working group should write to the person listed under the caption FOR FURTHER INFORMATION CONTACT expressing that desire, describing his or her interest in the task, and stating the expertise he or she would bring to the working group. All requests to participate must be received no later than April 30, 2001. All requests will be reviewed by the assistant chair, the assistant executive director, and the working group chair. Individuals will be advised whether or not the request can be accommodated.

Individuals chosen for membership on the working group will be

expected to represent their aviation community segment and actively participate in the working group (e.g., attend all meetings, provide written comments when requested to do so, etc.). They also will be expected to devote the resources necessary to support the working group in meeting any assigned deadlines. Members are expected to keep their management chain and those they may represent advised of working group activities and decisions to ensure that the agreed technical solutions do not conflict with their sponsoring organization's position when the subject being negotiated is presented to ARAC for approval.

Once the working group has begun deliberations, members will not be added or substituted without the approval of the assistant chair, the assistant executive director, and the working group chair.

The Secretary of Transportation determined that the formation and use of the ARAC is necessary and in the public interest in connection with the performance of duties imposed on the **FAA** by law.

Meetings of the ARAC will be open to the public. Meetings of the Airworthiness Assurance Working Group will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. The **FAA** will make no public announcement of working group meetings.

Issued in Washington, DC, on March 14, 2001.

Anthony F. Fazio,

Executive Director, Aviation Rulemaking Advisory Committee.

[FR Doc. 01-7068 Filed 3-21-01; 8:45 am]

BILLING CODE 4910-13-M

Recommendation Letter

Pratt & Whitney
400 Main Street
East Hartford, CT 06108

September 18, 2003

Federal Aviation Administration
800 Independence Avenue, SW
Washington, D.C. 20591

Attention: Mr. Nicholas Sabatini, Associate Administrator for Regulation and Certification

Subject: ARAC Recommendations, Airworthiness Assurance – Multiple Complex STC's

Reference: ARAC Tasking, Federal Register, dated March 21, 2001

Dear Nick,

The Transport Airplane and Engine Issues Group is pleased to submit the following as a recommendation to the FAA in accordance with the reference tasking. This information has been prepared by the Airworthiness Assurance Working Group.

- Recommendations for Regulatory Action to Enhance Continued Airworthiness of Supplemental Type Certificate

The FAA is asked to note that the Working Group was not tasked to evaluate non-structural (systems) modifications and these types of STC's are not addressed in the report.

Sincerely yours,

Craig R. Bolt

C. R. Bolt
Assistant Chair, TAEIG

Copy: Dionne Krebs – FAA-NWR
Mike Kaszycki – FAA-NWR
Effie Upshaw – FAA-Washington, D.C.
Amos Hoggard - Boeing

Acknowledgement Letter

MAR 8 2004

Mr. Craig Bolt
Assistant Chair, Transport Airplanes and
Engines Issues Area
400 Main Street, MS 162-14
East Hartford, CT 01608

Dear Mr. Bolt,

This letter responds to several letters from the Aviation Rulemaking Advisory Committee (ARAC) on Transport Airplanes and Engines (TAE) during calendar year 2003.

Date of Letter: May 14

Purpose: A request for economic support for a proposed part 25 rulemaking addressing ice protection systems.

FAA Action/Status: Kathy Ishimaru, the Federal Aviation Administration (FAA) representative on the Ice Protection Harmonization Working Group, and George Thurston of the FAA Policy Office indicated that Mr. Thurston has already provided the economic data to the working group. No further action is warranted.

Date of Letter: July 22

Purpose: Transmittal package with opposing views related to the ease of search task from the members of the Design for Security Harmonization Working Group.

FAA Action/Status: At the June TAE ARAC meeting, after learning the working group could not reach consensus, Mr. Kaszycki asked the working group to document its views and forward the package to the FAA through ARAC. The package has since been forwarded to the Transport Airplane Directorate for review and decision.

We may request the working group to help us dispose of substantive comments once the comment period for the notice of proposed rulemaking closes. Hence, we consider the working group to be in existence, but in-active until further notice.

This letter also acknowledges receipt of several recommendation packages:

Date of Letter	Task No.	Description of Recommendation	Working Group
Sep 18 ANM-01-024-A	7	Working group report with a long term plan addressing the effects of multiple complex structural supplemental type certification modifications on the structural integrity and continued safe operations of transport category	Airworthiness Assurance

		airplanes	
Sep 19	11	Working group report that provides language for a requirement to substantiate the operation of the airplane control systems is not adversely affected (jamming, friction, disconnection, damage) by the presence of deflections of the airplane structure due to the separation of pitch, roll, and yaw limit maneuver loads (25.683)	General Structures Harmonization
	9	Working group report that provides harmonized rule language and advisory material for fuel tank access cover impact resistance (§ 25.963(e))	
Oct 21	3, Part 1	Working group report addressing ventilation (heating and humidity), § 25.831(g)	Mechanical Systems Harmonization
Oct 21	3, Part 2	Working group report addressing cabin pressurization, § 25.841(a)	Mechanical Systems Harmonization
Oct 22	5	Working group report that provides harmonized § 25.571 language and accompanying advisory material for damage tolerance and fatigue evaluation of structure	General Structures Harmonization
Oct 22	6	Working group reports on widespread fatigue damage that address training syllabus, multiple element damage, and mandatory modifications	Airworthiness Assurance

I wish to thank ARAC and the working groups for the resources that industry gave to develop these recommendations. Since we consider submittal of the recommendation as completion of the tasks, we have closed the tasks, and placed the recommendations on the ARAC website at http://www1.faa.gov/avr/arm/arac/aracTransportAirplane.cfm?nav=6. The recommendation packages have been forwarded to the Transport Airplane Directorate for review and decision. We will continue to keep you apprised of our efforts on the ARAC recommendation at the regular ARAC meeting.

Sincerely,

Original Signed By
Nicholas A. Sabatini

Nicholas A. Sabatini
Associate Administrator for Regulation
and Certification

ARM-209:Eupshaw;fs:1/9/04; PC Docs #20579
cc: ARM-1/20/200/209; AIR-100; ANM-110
File #ANM-01-024-A; ANM-00-083-A; ANM-98-466-A; ANM-01-111-A; ANM-95-195-A.; ANM-99-969-A
Control Nos. 20032768-0, 20033095-0, 20033096-0, 20033097-0, 20033098-0, 20033099-0

Recommendation

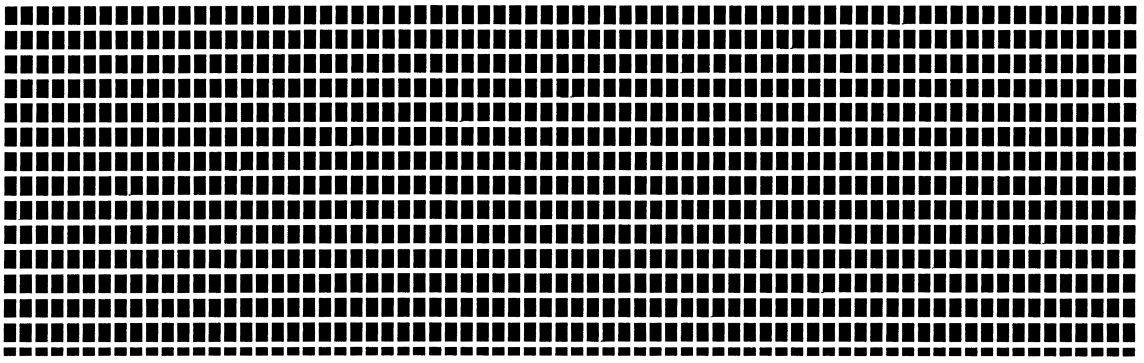
A REPORT OF THE
AIRWORTHINESS ASSURANCE WORKING GROUP

RECOMMENDATIONS FOR REGULATORY ACTION TO ENHANCE CONTINUED AIRWORTHINESS OF SUPPLEMENTAL TYPE CERTIFICATES

FINAL REPORT

January 21, 2003

SIGNED BY

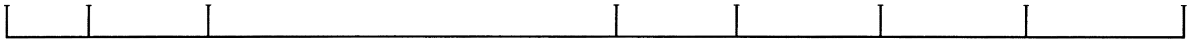


Kyatsandra Gopinath
Co-Chairperson, AAWG
Boeing Commercial Airplanes

Aubrey Carter
Co-Chairperson, AAWG
Delta Air Lines

REVISION PAGE

LTR	DATE	CHANGE	PAGES ADDED	PAGES DELETED	PAGES CHANGED	APPROVED BY



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Abbreviations and Definitions

AAP	Aging Airplane Program
AAWG	Airworthiness Assurance Working Group
ACO	Airplane Certification Office
AD	Accidental Damage
AD	Airworthiness Directive
AFM	Airplane Flight Manual
AMOC	Alternate method of Compliance
AOI	Applicant/Operator/Installer
ARAC	Aviation Rulemaking Advisory Committee
CAR	Civil Aviation Regulations
CAW	Continued Airworthiness
CFR	Code of Federal Regulations
CG	Center of Gravity
CIC	Corrosion Inhibiting Compound
CPCP	Corrosion Prevention and Control Program
CRI	Certification Review Item
CSTC	Complex Supplemental Type Certificate
DAS	Delegated Authority Station
DDP	Detail Design Point
DDS	DAS/DOA/SFAR
DER	Designated Engineering Representative
DOA	Delegation Option Authorization (FAA)
DOA	Design Organization Approval (JAA)
DSG	Design Service Goal
ED	Environmental Damage
FAA	Federal Aviation Administration
FEA	Finite Element Analysis
FOD	Foreign Object Damage
ICA	Instructions for Continued Airworthiness
ISP	Inspect Start Point
JAA	Joint Airworthiness Authority
JLP	Joint Local Procedures
JMP	Joint Multinational Procedures
LOV	Limit of Validity
MCSTC	Multiple Complex Supplemental Type Certificate
MED	Multiple Element Damage
MIDO	Manufacturing Inspection District Office
MLW	Maximum Landing Weight
MOU	Memorandum of Understanding
MPD	Maintenance Planning Document
MRA	Maintenance Repair and Alteration

MRB	Maintenance Review Board
MSD	Multiple Site Damage
MSG3	Maintenance Steering Group - 3
MTOGW	Maximum Takeoff Gross Weight
MZFW	Maximum Zero Fuel Weight
NAA	National Airworthiness Authority
NDT	Non-destructive Testing
NPRM	Notice of Proposed Rulemaking
ODA	Organization Designation Authorization
ODAR	Organization Designation Authorization Representative
OEM	Original Equipment Manufacturer
OMP	Operators Maintenance Program
OMT	Organization Management Team
PAX	Passenger
PC	Production Certificate
PCA	Primary Certification Authority
PCM	Project Certification Manager
PLR	Production Limitation Record
PMA	Parts Manufacturing Approval
PSE	Principal Structural Element
RAG	Repair Assessment Guidelines
RAP	Repair Assessment Program
SFAR	Special Federal Aviation Regulation
SMP	Structural Modification Point
SSI	Significant Structural Item
SSIP	Structural Supplemental Inspection Program
STC	Supplemental Type Certificate
STG	Structures Task Group
TAD	Transport Airplane Directorate
TAEIG	Transport Airplane and Engine Issues Group
TC	Type Certificate
ULD	Unit Load Device
WFD	Widespread Fatigue Damage

References

FAA Order 8110-4b entitled, "Type Certification", dated April 24, 2000

FAA AC 21-40 entitled, "Application Guide for Obtaining a Supplemental Type Certificate", dated May 6, 1998

FAR 25.1529 entitled, "Instructions for Continued Airworthiness (Amendment 25-54)", Effective October 14, 1980

Section H25.4 entitled, "Airworthiness Limitations section (Amendment 25-102)", Effective June 6, 2001

AC 91-56A entitled, "Continuing Structural Integrity Program for Large Transport Category Airplanes", dated April 29, 1998

Section 1 - Executive Summary

On March 21, 2001, the FAA formally notified the Aviation Rulemaking Advisory Committee (ARAC); Transport Airplane and Engines Group (TAEIG) through the Federal Register (**16089Federal Register / Vol. 66, No. 56 /**) of a new task assignment for action.The FAA requested the Aviation Rulemaking Advisory Committee to study the effects of multiple complex structural supplemental type certification (STC) modifications installed on transport category airplanes. The ARAC will develop a report with recommendations for a long-term plan addressing the effects of multiple complex STC modifications on the structural integrity and continued safe operations of transport category airplanes. This Task was assigned to the Airworthiness Assurance Working Group (AAWG) to complete. This report documents the findings of the Working Group for this Task.

The AAWG met a total of five times to accomplish the work set forth in the Tasking Statement. The AAWG reviewed the process for certification and application of structural STCs to airplanes and reached the following seven conclusions.

1. The AAWG found that subsequent to certification and application of an STC to the first airplane, the application of an approved structural STC to another airplane could be made without a conformal review of that airplane's configuration. Without such a review, there is no guarantee that the certified configuration of the structural STC is compatible with the airplane configuration. There may be other STCs, repairs, service bulletins installed and/or Airworthiness Directives in effect on that airplane that might adversely affect the validity of the proposed structural STC or visa versa.

2. The AAWG found that a new classification of a STC should be introduced known as a Complex Supplemental Type Certificate (CSTC). An STC is considered complex if it:

   a. Alters the design loads (static and/or fatigue) that affect a significant portion of the airplane structure, and/or
   b. Causes a change to the approved instructions for continued airworthiness, the Airplane Flight Manual and/or the Weight and Balance Manual.

   NOTE: A CSTC may or may not physically modify the airplane structure.

3. While the AAWG found that current procedures for certification of an STC are sufficient and do not require modification, there are procedural changes required for STCs classified as CSTCs.

4. The AAWG found that the guidance material defining the responsibility of the STC applicant is lacking in that it did not define the applicant's responsibility for continued airworthiness issues.

5. The AAWG found that the responsibility for configuration control of the airplane is vague and misleading and needs to be strengthened.

6. Considering the findings, the AAWG concluded that additional Special Certification Reviews should be conducted for situations where multiple CSTCs may have been installed to validate that the continued airworthiness programs have been properly updated.

7. The AAWG found differences in the means JAA and FAA administrate the granting and transferring of STCs. While the differences are cultural in nature, it is deemed that the processes are equivalent in intent.

Considering the conclusions reached by the AAWG, the AAWG recommends that the Aviation Rulemaking Advisory Committee (ARAC), Transport Airplane and Engine Issues Group (TAEIG) consider enacting the following five recommendations to ensure proper consideration of how an STC might interact and affect certification, aging airplane and continued airworthiness programs.

A. The existing STC Limitations and Conditions template should be revised. The current wording implies that it is the installer's responsibility to ensure that the incorporated STC does not introduce any adverse effects on the airplane. It is the recommendation of the AAWG that this responsibility be placed with the Operator/STC holder/Installer. This includes configuration control, STC compatibility with actual airplane, and continued airworthiness in regard to the STC design and application. This will require a new 14 CFR 21 rule with a revision to AC 21-40, new operating rules with an advisory circular (AC), and a change to Order 8110.4b.

B. Require a special identification of complex STCs, where the installation may result in interaction effects with other STCs. The recommendation would require the determination of a complex STC by applicants for new STCs. This will require a new 14 CFR 21 rule, revision to Order 8110.4b and AC 21-40.

C. Establish a set of criteria to consider in evaluating interaction effects amongst complex STCs. This recommendation would require the development of an FAA Order and possibly some advisory material.

D. Require all STC applicants to provide information within the Instructions for Continued Airworthiness of the regions and areas affected by the proposed STC. This will require a new part 21 rule, possible revision to §

25.1529, Appendix H, revision to AC 21-40 and Order 8110.4b.

E. The AAWG further recommends that the FAA conduct a Special Certification Review of those items (listed below) categorically classified as CSTCs to determine any additional maintenance actions required as a result of interactions not considered when the CSTC was installed:
   a. Hush kits,
   b. Winglets,
   c. Auxiliary fuel tanks,
   d. Re-engine,
   e. Weight increases,
   f. PAX cargo conversions
   g. Reinforced Flight Deck Doors

F. The AAWG recommends that the FAA and JAA regulations specific to certification and continued airworthiness of STCs and CSTCs be harmonized to the extent possible.

Section 2 - Introduction and Background

Under the provision of Title 14 of the Code of Federal Regulations, Part 21, an applicant who has shown compliance with the other pertinent sections of Title 14, may obtain a Supplemental Type Certificate (STC). The holder of a supplemental type certificate may use the approved engineering data to either physically modify the airplane or modify the way the airplane is flown or both. STCs can effect both the structure and systems of an airplane. This study is limited to structural issues.

The industry has used STCs for weight increases, winglet installations, passenger to cargo conversions, hush-kits, and fuselage fuel tank additions just to name a few. Once approved, the STC holder may apply the STC to any airplane for which type approval was given. The STC is also a commodity that the STC holder may sell or use to derive licensing fees. While there are other means of modifying a type certificate, STCs are the only means studied by this report.

In general, the granting of an STC follows the same path any certification program would follow. The path is described in FAA Order 8110-4b Ref [1]. A rigorous evaluation of the engineering analytical and test data is performed in light of the configuration of the airplane for which the modification is being considered. When compliance is found with all of the applicable rules and regulations, the STC is granted.

In the late 1980's, the FAA began to pass rules that limited the amount of noise produced by airplanes. These new rules limited the usefulness of some commercial airplanes because of the cost of either installing hush-kits or installing new, quieter engines. As a result, a number of airplanes became available that could be economically modified for cargo operation. A few enterprising individuals saw an opportunity to modify these airplanes for cargo operation and developed STCs that were subsequently approved by the FAA. These STCs included the following generic categories:

1) Install Upper deck Cargo Doors
2) Perform Weight Increases
3) Strengthen Floors
4) Install Hush-kits
5) Install winglets for improved performance

Review of these STCs in the late 1990's revealed that several of the STCs did not meet basic CAR 4b standards. In the process of reviewing the impact of this revelation, ADs were issued to insure fleet safety and questions were raised

about the basic certification process. As a result the FAA has amended its procedure for certification of STCs to insure that proper coordination (FAA Order 8110.4b and FAA AC 21-40) is in place to ensure uniform application of the regulations to type design but other questions remained. Principal amongst these was the question of STC interaction where several STCs could be placed on an airplane where independently, they would not be a significant concern but jointly would require additional modifications to the structure and/or amendment to the ICA or other operational documents for safety.

This report examines the STC certification process and makes suggestions as to how that process might be amended to identify STCs that might interact adversely with other STCs. This process would include a requirement that would prevent application of interacting or complex STCs without a thorough review of airplane configuration

Section 3 - ARAC Tasking

On March 21, 2001, the FAA formally notified the Aviation Rulemaking Advisory Committee; Transport Airplane and Engines Group through the Federal Register (**16089 Federal Register / Vol. 66, No. 56 /**) of a new task assignment for action. The FAA requested the Aviation Rulemaking Advisory Committee to study the effects of multiple complex structural supplemental type certification (STC) modifications installed on transport category airplanes. The ARAC will develop a report with recommendations for a long-term plan addressing the effects of multiple complex STC modifications on the structural integrity and continued safe operations of transport category airplanes. The complete text of the Tasking Statement appears in Appendix A. Subsequently, the ARAC, Transport Airplane and Engines Issues Group assigned action to the Airworthiness Assurance Working Group. The Task Assignment involves completion of the following items.

Task Title: Task 7, Multiple Complex Supplemental Type Certificates

Study the effects of multiple complex structural STC modifications installed on transport category airplanes. Develop a report with recommendations for a long term plan addressing the effects of multiple complex STC modifications on the structural integrity and continued safe operation of transport category airplanes, and the ability of the operators to accomplish mandatory FAA aging fleet programs.

The report should identify the types of structural modifications considered to be complex STC modifications, and should propose recommended actions to be taken by the FAA to address the effects complex structural STC modifications have on the structural integrity and continued safe operation of modified airplanes.

The report and recommendations should contain the following:

1. A description of FAA and industry actions necessary to identify the interaction effects of multiple complex STC modifications,

2. A description of FAA and industry actions that will address the effects that complex modifications have on aging airplane issues, and

3. A description of FAA and industry actions necessary to address the effects that complex modifications have on FAA mandated airworthiness actions (i.e., airworthiness directives, aging airplane programs).

Schedule: The report should be completed no later than September 28, 2002.

As a result of the completion of the tasking, the FAA expects a task report detailing the investigations conducted along with recommendations for further FAA Action. While the recommendations may include a requirement to develop regulatory action, the actual writing of that requirement will be reserved to the FAA or assigned as an additional ARAC Tasking.

This report comprises the recommendations from the AAWG on the task assignment from ARAC.

Section 4 - Purpose of Report

This report identifies the types of structural modifications considered to be complex STC modifications, and recommends actions to be taken by the FAA to address the effects complex structural STC modifications have on the structural integrity and continued safe operation of modified airplanes including Airworthiness Directives and aging airplane programs.

Definitions of complex STC's are established in the context of structural effects on the airplane.

From this investigation, recommendations and criteria are defined for evaluating STC's and their interaction with other installed STCs. Means to define and control the configuration of the airplane are also established.

The report is limited to structural STC's only.

Section 5 - Case History and Lessons Learned – PAX to Cargo Modification

The driving force behind the MCSTC tasking originated from the FAA investigation of the PAX to Cargo Conversions. As such, the information gathered and lessons learned through that investigation are relevant and contribute to the purpose of this report. The following is a list of the most significant lessons learned from that investigation.

a. Case History PAX to Cargo Conversion

Investigations into some PAX to Cargo STCs have shown that certain STCs were granted with minimal DER review and FAA ACO involvement. As a result. The process to do PAX to Cargo conversions has been standardized. It is recognized that a common approach to such complex STCs by both the applicant and regulator is beneficial to all parties. The following summarizes the most significant lessons learned from this case history:

b. Lessons Learned

1) Some STCs did not have all of the critical load cases for the structure being modified evaluated in their data packages.

- Example: Installation of a upper deck cargo liner could change rapid decompression analysis. In some of the data packages for PAX to Cargo STCs, this analysis was missing.
- Example: Critical load case for some 727 PAX to Cargo floor beams was upload with a unit load device (ULD) 10% center of gravity (CG) offset. This load case was missing in some 727 PAX to Cargo data packages.

2) Some applicants did not provide design data with adequate detail, assembly, and installation definition and did not account for airplane configuration.

3) Applicant/operator/Installer (AOI) did not have knowledge and/or control of the configuration of the airplane being modified. Examples of where this occurred:

- Example: Installation of a 727 airplane upper deck 9G barrier system installation. The 727-200 airplane has a galley door installed immediately aft of the barrier while the 727-100 has none. In other words, a STCs should not be installed on an airplane whose configuration does not match that of the original first article inspection.

- Example: A large antenna installation STC is sold to an operator who plans to install it on an airplane that already has other complex STCs (such as a cargo conversion) installed. In other words, a STCs should not be installed on airplane until the existing airplane configuration has been evaluated.

4) Data packages did not contain evaluation of STC impact to existing aging airplane programs, mandatory modifications programs, ADs, or other major STCs for subsequent applications of the specified STC.

Section 6 - Complex and Multiple Complex STC's

This report is limited to the discussion of STC's or those portions of STC's that affect airplane structure. The effect that such STC modifications may have on electrical, environmental, avionics, fuel, propulsion systems are not considered.

a. Definitions

An STC is considered complex if it:

- Alters the design loads (static and/or fatigue) that affect a significant portion of the airplane structure, and/or
- Causes a change to the approved instructions for continued airworthiness, the Airplane Flight Manual and/or the Weight and Balance Manual, and

NOTE: A CSTC may or may not modify the airplane structure.

The engineering data of a complex STC (CSTC) addresses and documents the effects on the structure modified by the STC, as well as unaltered structure or structure modified by prior installed STC's or Airworthiness Directives away from the STC installation. Such effects include structural strength, damage tolerance and fatigue properties, and failure modes.

In addition to the structure itself, the CSTC's data package includes new or revised documentation associated with airplane's operation and maintenance programs. Included are (1) Instructions for Continued Airworthiness (ICA), (2) Aging Airplane Programs, (3) Operators' Maintenance Programs, (4) Other FAA mandated programs, and (5) the FAA Approved Airplane Flight Manual and Weight and Balance Manual.

A CSTC does not necessarily modify the structure. An example of this is a weight increase accomplished by restricting the C. G. of the airplane. This operation raises both the external and internal loads for certain areas of the structure that will need to be assessed for static strength and accompanying margins of safety, as well as for damage tolerance,. The results of that investigation may lead to changes in the ICA together with changes to the AFM and Weight and Balance Manual.

Multiple Complex STC's are simply two or more CSTC's that interact with one another. That is, when a later installed STC affects the structure or the

maintenance programs modified by one or more earlier installed STC's, the combined STC's are multiple complex.

b. Criteria for Identifying a CSTC

A CSTC measurably affects one or more of the following items:

1) Weight and/or cg of the airplane.

Significant changes in weight/cg can have a widespread affect on the airplane structure. The magnitude and/or distribution of external loads on fuselage, wing, empennage, control surfaces, and landing gear may be affected. These loads must be evaluated for their significance upon the new as well as the original structure as modified by STCs and repairs, The effect on existing airworthiness programs also need to be evaluated.

2) Aeroelastic properties of major structural components.

Changes in aeroelastic properties include changes to stiffness, major load paths, as well as changes in dynamic response characteristics of the structure. Such changes affect the internal load distributions within the structure. Large cutouts, the addition of heavy mass items, added material, or replacement of one material for another are examples affecting aeroelastic properties.

3) Critical flight or ground external loads.

Changes in critical external loads can have a wide influence, affecting loads on all major structural components. Critical conditions include:

(a) Basic Design Conditions – taxi, take-off, landing, steady and abrupt maneuvers, gust and turbulence, flutter and vibration; sonic fatigue; dynamic landing,

(b) Special Conditions, such as rapid decompression , engine seizure, and special conditions imposed by the regulator for a unique design,

(c) Operational loads on doors, latches, and hinges. Such conditions must be identified and considered in the assessment of the airplane structural integrity, and the possible interaction effects on multiple complex STC's.

4) Internal load distribution near and away from the site of the complex STC's (MCSTC's).

The changes in internal load distribution caused by the STC modification must be evaluated to determine the extent of the structure affected. As discussed above changes in aeroelastic properties and/or external loads cause changes to the

internal loads. Interaction of redistributed internal loads caused by MCSTC's must be evaluated for increased internal stresses and reduced margins of safety (both static and fatigue). To thoroughly evaluate the combined effect of MCSTC's, the effects of existing STC's already on the airplane need to be accounted for and included in the substantiating analysis.

5) Critical Margins of Safety near and away from the site of the complex STC's (CSTC's).

The margins of safety associated with prior installed STC's must be evaluated for possible effects from installation of the new STC.

6) Damage Tolerance Issues

New Inspection items, and intervals may be required, or existing ones revised. See "Effects on Aging Airplane Issues and FAA Mandated Programs" below for further discussion.

c. Examples of CSTC's

Given the above definitions and criteria, several examples of Complex STC's are given below.

1) Passenger-to-Freighter Conversions

Typically such a conversion requires a large cutout in the forward fuselage area, to accommodate the installation of a large cargo door. Floor structure strengthening may also be required. The fuselage structure surrounding the cargo door installation is directly affected as well as the floor beams supporting structure. Fuselage internal load distribution is dramatically altered due to the change in structural stiffness and modified load paths. The floor running loads for a freighter are affected by cg offset and height of the cargo. Additionally, other structural components may also be affected. The airplane c.g. and design speeds envelopes may need to be modified to accommodate the cargo payload. Also, aileron deflections (and loads) must increase to balance the increase in lateral cg offset of payload. This increase results in increased wing bending moment. Another factor is the increased floor running load may input increased loads into the center wing structure. Modifications in the fuel management may also be required to compensate for the center wing load increase. This will require a modification to the Airplane Flight Manual (AFM) and Weight and Balance Manuals The modifications and potential weight increases will affect the continued airworthiness program and will require a assessment of inspections.

2) Operating Weight Increases (MTOGW, MZFW, MLW)

Weight increases have a widespread effect on the airplane. Typically wing loads (shear, torque, moment) are increased. Balancing tail loads are increased, which also affect fuselage structure. Landing gear loads are also affected which can have an adverse affect on Safe-Life limits.

3) Re-engining and Hushkits

In addition to the engine and pylon structure directly affected, such modifications typically add weight to the airplane – affecting c.g. and wing loads, along with horizontal tail and fuselage loads and various parts which might be life-limited(e.g. Safe-Life Parts). Also hushkits may impart sonic vibration to the structure, potentially causing metal fatigue in some thin-skinned components (such as the rudder surfaces) and would effect the ICA. Engine weight increases may affect flutter margins and need evaluation. There may be AFM and Weight and Balance Manual changes to achieve the necessary noise reductions for the hushkits.

4) Winglets

Winglets effectively increase the wingspan, creating increased lift and bending moment at the wingtips. As a result, the center of pressure on the wing shifts outboard toward the wingtip. Overall wing bending moment is increased, even though the operating weight of the airplane remains unchanged. Airplane c.g. and balancing tail loads are also affected. Winglets may also affect flutter margins. These changes may affect the ICA, AFM, and Weight and Balance Manuals.

5) Auxiliary Wing Tip Fuel Tanks

The added weight from the fuel tanks, effectively reduces wing loads for critical up-load conditions. However, critical down loads may increase, such as dynamic landing conditions. Increased aerodynamic drag load also affects wing loading. Airplane cg and balance may also be measurably affected. Auxiliary Wing Tip Tanks may also affect flutter margins. These changes may affect the ICA, AFM, and Weight and Balance Manuals.

6) Auxiliary Fuel Tanks Installed in the Fuselage

The installation causes a significant change in weight distribution in the fuselage structure. The overall airplane weight, c.g., and balance are affected. Like a freighter conversion, the c.g. and design speeds envelopes may be have to be adjusted to maintain acceptable overall balance and loading on the airplane. Structural modification to the local fuselage is required to mount the tanks. These changes may affect the ICA, AFM, and Weight and Balance Manuals.

7) External Door Installation in a Pressurized Fuselage

The cutout in the fuselage affects the structural stiffness and load paths. Consequently, the internal load distribution in the fuselage is affected both near and away from the site of the installation. The installation of a cargo door for a passenger-to-freighter conversion is an example. See "Passenger to Freighter Conversions" above.

The changes of external and internal loads may have a significant effect on the safety margins for static strength, the safe life limits and/or the fatigue and damage tolerance behavior including the WFD parameters of airplane structure. These changes may affect the ICA.

8) Other STCs that may be complex depending on situation

(a) Antenna Installations

Installations of one large or a number of small antennas on an airplane may affect the damage tolerance characteristics. Antennas can create significant aerodynamic loads as well as added weight. The result is the overall c.g., balance, and external loads are affected. Installation of the antenna may create increased inspection requirements (e.g. hidden structure and/or new PSEs) for continued airworthiness. These changes may affect the ICA, AFM, and Weight and Balance Manuals.

(b) Reinforced Flight Deck Doors

While a Reinforced Flight Deck Door does not strictly meet the definition requirement for a CSTC, the sensitivity of this particular STC to the Decompression requirements is deemed sufficient to qualify it as a CSTC. Typically a reinforced flight deck door is considerably heavier than the original OEM door. The rapid decompression venting capability is likely to be altered significantly from the original OEM design. Consequentially the applied loads to the surrounding structure will be altered and may, on occasion, require local structural reinforcement. The doors are typically supported by an adjacent galley, lavatory or other interior item which may have been installed or modified by a STC. Also the altered decompression loads affects the entire fuselage pressurized shell as well as the main deck floor structure.

d. Effects of CSTC Interactions on Aging Airplane Issues and FAA Mandated Programs

On June 1988, FAA sponsored the international conference on aging airplanes where the Airworthiness Assurance Task Force (AATF) was formed. This Task Force, now known as the Airworthiness Assurance Working Group (AAWG), defined recommended corrective actions to assure the continued airworthiness of the structure. This program included specific action in the six areas.

- Update on a regular basis the Supplemental Structural Inspection Program (SSIP)
- Implement a Corrosion Prevention and Control Program (CPCP) taking into account the fleet experience
- Develop a Repair Assessment Program (RAP) to classify and determine appropriate maintenance actions for repairs in the fuselage pressurized shell.
- Review of existing Service Bulletins to define the need of mandatory modifications taking in account the fleet experience
- Develop maintenance recommendations for aging airplanes
- Define actions to avoid Widespread Fatigue Damage (WFD) occurrence for as long as the airplane remains in service

A CSTC will have an effect on these aging airplane issues because it, by definition, has an affect on several important parameters (geometry, load, and stress). While these effects have been considered on the first application, subsequent application of the STC to airplanes of potentially different configuration must be considered. In addition, in case of multiple complex STC installations, combined effects must be considered.

1) Supplemental Structural Inspection Program (SSIP)

The purpose of the SSIP is to ensure continuous structural airworthiness of the airplane. It is developed in accordance with AC 91-56. It is based on a damage tolerance analysis of the PSEs, using stress data, mission profiles and experience from fatigue tests and other applicable experience.

A CSTC could create or modify a PSE requiring a new fatigue and damage tolerance assessment to account for:

- Change of the loads and stresses, including new load spectra for fatigue justification.
- Modification of the inspection conditions (i.e. access, NDT method applicability)
- Creation of a new Detail Design Point within an existing PSE.
- Creation of a new PSE

In the case of multiple complex STC, a PSE can be affected by several changes. The cumulative effect should be defined by a new analysis taking into account the modified structure.

2) Corrosion Prevention and Control Program (CPCP)

The CPCP is intended to control the corrosion conditions of the airplane.

The structural task group (STG) of each airplane model reviews the CPCP contents on a regular basis. The STGs are groups comprised of industry experts on particular airplane models, representing both the manufacturer and operators, that were formed to provide advice to the manufacturers on aging structural issues. The corrosion tasks are defined first with an MSG3 analysis taking into account environmental condition, material and usage and they are possibly updated with the in-service experience.

A complex STC can affect this program for the following reasons:

- Use or change of materials with different corrosion sensitivity
- Modification to the protection scheme.
- Mixing new material with existing one that affects the galvanic corrosion conditions
- Change to the access conditions.
- Change of the usage of the airplane (i.e. Pax to freighter conversion) that modify operational parameters, leading to a review of the environmental analysis.

In the case of multiple complex STC affecting the same zone a new maintenance requirement should be defined by a new analysis. For example, installing an interior modification involving a lavatory and a galley directly above a STC installed aux fuel tank creates a condition where both accessibility and environment are compromised.

3) Repair Assessment Program (RAP)

Since May 2001, Repair Assessment program is a requirement of the FAR 91-140 and 121-370. It requires assessing any repairs in the fuselage pressurized shell in order to classify each repair as either permanent or temporary. Secondly, the program defines the necessary supplemental inspection program for the repair. The categorization and inspection definition is based on guidelines taking into account damage tolerance analyses.

If a CSTC affects the loads and stresses of the pressurized shell, new analysis must be performed for the repairs in the affected areas. The STC ICA is also changed and approved by the authority. Each CSTC should define these affected areas.

The new analysis has the potential of changing the repair classification (permanent with or without inspections, temporary) and/or the associated inspection program.

In case of more than one CSTC affecting a given area, the cumulative effect should be defined by a new analysis.

4) Mandatory Modifications Program

Each Structure Task Group (STG) reviews existing Service Bulletins (SBs) in order to collect in-service experience and propose, if necessary, mandatory corrective actions. Each operator within the STG rates the SBs based on their service experience. From this and other OEM data a decision is made on whether or not to propose the SBs to the FAA for mandatory modification or inspection programs.

A CSTC changes conditions (loads, stresses, access...) in an area therefore the original STG conclusions need to be reassessed (i.e. revised threshold...)

The concern exists however, that the STC Holder is not part of the STG process and sharing of in service findings is generally limited to the FAA. It is up to the STC Holder and the Operator to insure that the threshold for any future mandatory modification is assessed and adjusted appropriately.

Obviously, the situation is worst in case of Multiple Complex STCs because the number of possibly involved STC holders.

5) Develop Maintenance Recommendations for Aging Airplanes

In examining the issues surrounding the 1988 Aloha accident, the industry discovered that there was little guidance available for maintenance programs for an operator who was trying to maintain an ageing aircraft. The AAWG authorized the production of a document with the help of the ATA, AIA, and FAA that provides the necessary guidance. This document is available from the ATA as ATA Report 51-93-01

6) Widespread Fatigue Damage (WFD) / Limit of validity (LOV)

Widespread Fatigue Damage rulemaking activity is currently ongoing but is not yet completed. Draft Advisory Circular AC91-56B is prepared. The proposed WFD rule would require that analysis be performed for any structural detail prone to multiple site damage (MSD)/multiple element damage (MED). The analysis will define the maintenance program necessary for safe operation (i.e. an Inspection Starting Point (ISP) and/or the Structure Modification Point (SMP)).

A CSTC may affect the WFD analysis in the following ways:

- A CSTC can introduce new structural details susceptible to MSD/MED

(e.g. new large joint). A new WFD analysis should be done to define the maintenance program requirements within the defined LOV of the existing maintenance program.

- Where existing structure is affected by the CSTC, the MSD/MED prone areas must be reviewed to ensure that their maintenance programs are still valid for the defined LOV (e.g the circumferential fuselage splices near the wing will require a reassessment because of higher loads caused by a gross weight increase).

7) Effect on other Airworthiness Directives

Other ADs, not included in the above paragraphs are usually due to in-service problems that have been analyzed with specific conditions (experience, load, and configuration...). The concern here is that an AD in effect on an airplane at the time a CSTC is installed following initial certification, may not be properly addressed. The evaluation of the effects of the CSTC must be accounted for in the instructions for continued airworthiness with an AMOC.

Any complex STC which affects any applicability conditions (access, NDT method feasibility...) of an AD or the load/stress of its area should lead to a new analysis of this AD requirements.

e. Effects on Airplane Configuration of CSTC Installation

The main parties involved in STCs (applicant, installer and FAA) currently assume or in some cases ensure an airplane's configuration is understood and assessed for impact with a proposed new STC. The current amount of evaluation and assessment can range from comprehensive to non-existent.

The regulatory requirement for this type of evaluation and assessment is contained in FAA Order 8110-4B, Section 4-2.e.1. Per this section of the FAA Order, the STC applicant for first article installations is generally required to determine the configuration of the affected airplane being modified. Configuration means type certificate basis, any STCs or service bulletin previously applied, any major repairs, and any ADs in effect for the particular airplane being considered. If interactions are discovered between the existing configuration and the proposed STC, the applicant generally includes requirements in the Instructions for Continued Airworthiness (ICAW) to address the interactions as part of the engineering package for certification.

Actual experience shows that STC applicants try to understand and take into account configurations but do not always know the extent of previous modifications or their interactions with their proposed STC.

Installers are typically the least prepared to conduct a thorough evaluation and analysis of the interaction effects between the existing configurations and the proposed STC. They may know the configuration, but lack the means for understanding how it interacts with the STC. However, current STCs have boilerplate statements that the *installer* is responsible to ensure it does not adversely impact airworthiness of the airplane (FAA Order 8110-4b Section 4-4.f.2). Since the installer does not possess the engineering data that defines the configuration and how it interacts with the STC being installed, the installer generally only evaluates fit, form and function. This leaves another loophole for inadequate interaction evaluations.

Another problem is understanding and addressing airplane configuration on subsequent airplanes being modified per a previously approved STC. There are no requirements placed on the STC holder or the type certificate holder for these follow-on installations. Current STC paperwork shows to which airplane type the modification applies, but not to specific factory serial numbers. It does not, as a matter of common practice, state applicability down to the airplane serial number. Airplane within a fleet model and series can vary significantly from tail number to tail number.

f. Effects of Interactions on operator approved maintenance programs.

The current requirements of the FAR require the development of structural maintenance programs that prevent catastrophic failure of the airplane due to accidental, environmental, and fatigue damage. One means of accomplishing this is by implementing an MSG-3 process to develop the structural maintenance program. If the applicant desires to use this approach then the accidental damage, environmental damage and fatigue damage programs need to be reevaluated.

Section 7 - Potential Effect on Operators

The installation of new CSTCs will have the following effects on operators:

a. *Installation Requirements*

Operators would be required to determine, document and record configuration differences and interaction effects on each airplane incorporating multiple complex STCs vs. current requirement for conformity inspection on only the first airplane accomplished. In order to accomplish this the operator, installer and STC holder would need to establish responsibilities in the STC installation process. Cooperation would be require between the operator, installer and STC Holder to determine the current configuration, that would allow the STC holder to assess the effect the new STC will have on the current configuration. One process might be as follows:

1) Preparation For STC Installation

Prior to installation of a STC, the operator is responsible for providing information to the installer concerning the current configuration of the aircraft. This information shall be based on aircraft maintenance and modification data in the hands of the operator.

2) Airplane Survey

Using data supplied by the operator, the installer would inspect the aircraft to confirm the configuration prior to installation and/or provide information to the operator concerning undocumented Repairs/Alterations/Modifications (RAMs).

3) STC Revalidation

Based on information provided by the installer, the operator shall reassess the aircraft configuration, if necessary, and provide this data to the STC holder for evaluation for STC validation for the specific airplane configuration.

b. Continued Airworthiness Requirements

Operators would be required to develop and incorporate Instructions for Continued Airworthiness (ICA) for each STC addressing interaction effects with the following programs:

- Aging Airplane Programs (S/B Modifications, CPCP, SSIP, RAG, WFD)
- Airworthiness Directives (and record of equivalent level of safety technical data) for changed structure
- MPD, MSG-3 maintenance program changes (see Section 6f)

Section 8 - Regulatory Options

a. Discussion of current STC Practice/Regulations and Significant Issues

1) FAA Regulations and Procedures

(a) Background.

The FAA has been issuing STCs since 1955. The first STC issued by the FAA was SA4-1, which was issued on December 12, 1955. The FAA has a long history of supporting STCs as a means of modification in the commercial fleet. The requirements to obtain an STC are defined in part 21 of 14 CFR.

Per § 21.113, any person may apply for an STC and must apply by the appropriate form (8110-12). The STC by definition is a major type design change.

§ 21.115 describes the applicable requirements that the applicant must meet to obtain an STC

- § 21.101 - Certification Basis
- § 21.93(b) - Classification of changes in type design (Part 36 Noise)
- § 21.93(c) - Part 34 fuel venting and exhaust
- § 21.33 - Inspection and test
- § 21.53 - Statement of conformity

Note: The items above, for example, §21.93(c), would not necessarily apply to all STCs.

Per § 21.117, If applicant meets the requirements of § 21.113 and § 21.115 then they are entitled to an STC.

Per § 21.119, the STC Holder can obtain airworthiness certificates, obtain approval of the installation and obtain a Production Manufacturing Approval to produce multiple copies of the STC item.

Per § 21.50, the STC Holder is responsible to provide Instructions for Continued Airworthiness (ICA) per § 25.1529.

STC Transferability is described in § 21.47. The responsibilities and data retention for STC transfers is described in FAA Order 8110-4b, page 35

Per Order 8110.4B, an STC is effective until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator. The procedures for surrender, suspension, or revocation of an STC are identical to the respective procedures for a TC (§ 21.51)

(b) Delegated Authority Station (DAS)

A DAS is an FAA delegated organization that has been delegated to issue STCs with minimal FAA involvement. Within the DAS FAA delegation, specific limits are defined that limit the scope of work. Normally the FAA will define the certification requirements for the project being accomplished. Beyond that the DAS may develop the data for certification including the ICA, install the STC and release the airplane back into service. As part of the delegation, every DAS has a Quality Procedures Manual that is approved by FAA ACO. The DAS is audited by the cognizant ACO yearly.

The DAS submits an application to the cognizant ACO that describes the certification basis and applicable requirements that will be followed to substantiate the STC. If the application is acceptable the ACO approves the project.

(c) Proposed Organizational Designation Authorization (ODA)

The objective of the ODA is to create a comprehensive, systematic approach for delegating airplane certification, maintenance, and operational functions while maintaining safety. The ODA rule will expand functions which may be delegated and will be available to all organizations. Another objective of the ODA is to ensure compatibility with other Civilian Aviation Systems.

The ODA rule will consolidate all the FAA delegation authorization into FAR Part 183. The ODA is a new subpart D to part 183. The ODA rule will terminate the current delegated organizations after three years: Delegation Option Authorization (DOA) (part 21, subpart J), DAS (part 21, subpart M), SFAR 36 and Organizational Delegation Authorization Representative (ODAR). The ODA rule will also standardize renewal requirements for individual designees.

The ODA rule will expand eligibility for delegations (FAR 183.47). The eligibility for delegation will include anyone having significant and appropriate experience in performing the functions for which the ODA is sought. Those seeking delegation as an ODA could include Repair Stations, Operators, Manufacturers and consultant type organizations. The ODA is for organizations and not for individuals.

The personnel requirements per § 183.51 include the necessity for a qualified ODA Administrator and a staff of engineering, flight test, inspection, maintenance or operations personnel.

The limitations of the ODA are delineated in § 183.55. The ODA may only perform functions as defined in the procedures manual. The ODA may not perform an authorized function if there has been any change that may affect the performance of that function. The ODA may not issue certificate or approval

which requires a finding by the Administrator until the Administrator makes the finding.

The FAA reserves and does not delegate inherently governmental functions such as determining original certification basis, rulemaking, special conditions, equivalent level of safety, surveillance and oversight. The FAA will issue original certificates (e.g. TC, PC, and Repair Stations).

There are various ODA authorized functions:

- TC ODA – Type Certification Functions
- PC ODA – Production Certification Functions
- STC ODA – Supplemental Type Certification (STC) Functions
- Technical Services ODA – Technical Services Functions
- MRA ODA – Requirements for Maintenance, Major Repairs and Major Alterations Functions
- GA ODA – Requirements for General Aviation Functions
- PMA ODA – Requirements for Parts Manufacturer Approval (PMA) Functions

The ODA authorized functions that would be related to CSTCs are the following:

<u>STC ODA Functions</u>

- Repair station/operator/manufacturer
- Approve data/find compliance
- Approve manuals/supplements
- Establish conformity requirements/determine conformity
- Perform compliance inspections
- Issue airworthiness certificates
- Issue STCs

<u>Technical Services ODA</u>
An organization may be granted ODA authorization to function as a "Consultant" type of organization not affiliated with Repair Station, Operator, Manufacturer, etc.

- Issue STCs
- Approve data for major alterations/repairs
- Approve data/find compliance
- Issue airworthiness certificates

The DDS (DAS/DOA/SFAR 36) Order 8110.9 was issued on August 7, 2002. Implementation and experience with DDS is critical to successful implementation of ODA. The priority will be given to transition of existing DAS/DOA/SFAR 26. Experience must be must gained with ODA system before widespread implementation is accomplished

Although the rule sets the regulatory framework to allow increased delegation, most functions are already delegated to organizations and individuals. There will be very few qualified applicants who are not already DAS/DOA/SFAR/ODAR. The major impact will be delegation to PMA holders. The priority in first three years will be transition of existing delegation holders. Existing DAS/DOA/SFAR/ODAR organizations will be managed under the same principals currently in place. ODA adds to increased accountability imposed by DDS Order on the delegated organization. The FAA project management and participation will be the same as it has been for previous designees.

Status of ODA.
The FAA/Industry team working on developing final ODA Order requirements (Draft 8100.ODA) reached final team concurrence Jun 02 and the NPRM is in the process of being released for comment.

2) JAA Regulations and Procedures - Proposed Part 21 JA/JC(NPA)

The underlying principle of a JAA issued STC is, that it is mutually acceptable by all JAA full member Authorities, providing the original product has been certificated or validated by JAA procedures. JAA-STC procedures can be used on non - JAA certificated or validated products but those STCs are not automatically accepted, validation by the individual JAA national authority will be necessary.

(a) Application for an STC

Application for an STC shall be made to the National Authority (NAA) of the applicant.

The NAA will investigate the aspects of Design Organization Approval (DOA) approval under JAR21 Subpart E. The JAA will only accept applications submitted for an STC from an appropriate Design Organization approved under Subpart JA or JC (NPA). If the applicant has no DOA, a DOA investigation is undertaken. If the applicant already holds a DOA, the DOA team leader must evaluate the capabilities of the organization and if necessary update the terms of approval to include novel or specific aspects of the STC.

- Design Organization Approval (DOA)
  - Subpart JA/JC (Cannot get JA-DOA due to size, can only do JAR-22, VLA,Basic Part 23, and JAP-P)
    - Applicant must demonstrate need for approval
    - Must have a Design Assurance system
    - Company exposition

- Terms of approval defining the scope and work definition
- Sufficient Staff and experience
- Adequate facilities and equipment
- Frequent Authority audits
- DOA is not transferable

(b) Classification of an STC

The STC will be classified by the JAA as Category 1 STC, or Category 2 STC

- CAT 1 STC

  Is a major design change, which necessitates a change to Type Certification Basis. In this case the JAA procedure used in the certification/validation of the product is the JMP or JLP process, which in principle is the same as a post-TC procedures for a Major Design Change. The PCM in consultation with the certification authority will decide which disciplines and how many specialists are required to carry out the investigation and approval process.

- CAT 2 STC

  A major type design change that does not necessitate a change to Type Certification basis. For this category STC the approval process will be carried out following the JLP principles by one of the NAA, on behalf of all the other NAAs.

(c) STC Approval

Where the design change involved in the Category 1 STC, is "Significant", the JAA Certification Director will issue a JAA recommendation letter to all NAAs .The following documents will be attached to the JAA recommendation letter for STC approval

- Statement of compliance signed by the Applicant
- Statement of compliance signed by the PCM or PCA -STC
- The STC granted by the NAA of the STC applicant, or the NAA to which the application is made (normally the First Customer Authority) in the case of JAA Validation.

For JAA Validation, other conditions may be defined in the Arrangement made in accordance with JAR 21.N5

(d) STC Supporting Documentation

The authority determines whether STC supporting data can be based on applicant's own resources or through data or support obtained in an arrangement with the TC holder. If an arrangement with the TC holder was used to develop the data, this arrangement must be demonstrated to the authority.
Documents to identify all part of the Type Design and approved Manuals affected by the change. STC definition document, description of changes, drawings, diagrams and schematics should also be included.

- CRIs defining applicable requirements
- Certification program/plan
- Compliance checklist identifying the requirements with which the change has been designed to comply. List of affected Type Design requirements for which a new demonstration of compliance is necessary, supported by analysis or test
- Compliance documents reviewed and approved by the compliance verification experts with the applicant.
- Supplements to manuals or documents required by applicable requirements.
- Accomplishment instructions are part of the STC documentation. They should be prepared by the STC holder and distributed as approved data. Approval of the instructions may be granted directly by the Authority or through the DOA if that privilege has been granted.
- Liaison with production. The STC holder should identify in the STC supporting documentation, the production organization(s) that will receive approved data and assistance in order to permit production of airworthy parts eligible for installation as part of the STC.

(e) Certificate

When the investigation has been completed and compliance has been found, the investigating authority issues a STC certificate.

(f) Mutual Recognition of STC

This is archived by publishing in the JAA Administrative and Guidance Material information on the STCs approved by the NAAs

(g) Post STC Activities

The following activities need to be examined to determine appropriate actions:

- Major Changes

  With the exception noted below and in accordance with JAR 21.117(b) and N117(b) , each major change to that part of a product covered by an

STC must be approved as a separate STC. Except for major changes originating from an STC holder who is also the Type Certificate Holder in which case JC/VP Chapters M/12 or L/12 can be used

- Minor Changes

  Minor changes to that part of a product covered by an STC will be approved in accordance with JAR 21.117(a), by the NAA, or under the DOA of the STC Holder, or under another DOA having the appropriate Terms of Approval. These changes will be accepted automatically by all NAAs. Minor changes to that part of a product covered by a JAA validated STC will be approved in accordance with JAR 21N117(a). These changes will be automatically accepted by the NAAs, in accordance with the Arrangement under JAR-21N5

- Continued Airworthiness

  The STC holder must have a system for collecting, investigating, and analyzing in-service difficulties. Informing operators and reporting to the Authority. The NAA of the STC Holder, or Exporting Authority is responsible for generating and transmitting to the operating States corrective actions relative to STC in-service problems, in accordance with ICAO Annex 8.

(h) STC Transferability

This may only be made to an organization that can satisfy the following:

0. The organization has appropriate DOA approval
0. The STC holder must have a system for collecting, investigating, and analyzing in-service difficulties. Informing operators and reporting to the Authority
0. All relevant STC records (design, drawings, test reports, inspections, changes to product) shall be held by the STC holder and must be at the disposal of the Authority.
0. The holder shall maintain and update manuals
0. Continued Airworthiness of product must be maintained.

(i) Duration of an STC

Effective until surrendered, suspended, revoked, or a termination date is established by the Authority.

b. Summary of Differences in Regulatory Approach FAR/JAR

1) Application

FARs allow any person to apply for an STC.

JARs require JAA to only accept STC applications submitted from an appropriate Design Organization approved under Subpart JA or JC. Persons not covered by a DOA may make application for a Local NAA STC.

2) STC Transferability

FARs allows an STC to be transferred to any person regardless of capability. The new holder is responsible for 21.3 – reporting of failures.

JARs require that an STC may only be transferred to an organization that can satisfy the following:

- The organization has appropriate DOA approval
- The STC holder must have a system for collecting, investigating, and analyzing in-service difficulties. Informing operators and reporting to the Authority
- All relevant STC records (design, drawings, test reports, inspections, changes to product) shall be held by the STC holder and must be at the disposal of the Authority.
- The holder shall maintain and update manuals
- Continued Airworthiness of product must be maintained.

3) STC Supporting Data

FARs do not require that an applicant distinguish where the source of the STC supporting data came from

JARs – The STC supporting data can be based on the applicant's own resource if the Authority deems it acceptable, or it could insist on the TC Holder involvement.

4) Authorized Organizations

FAA – Designated Alteration Stations are approved organizations to issue STCs, modify the airplane and release it back to service. The DAS can only work within their limitations which are agreed to by the local ACO. An applicant does not need to be a DAS to receive an STC from the ACO. The FAA is moving towards ODA.

JAA – Approval of the organization capable to carry out STC work, and

necessary requirements needs to be demonstrated to the National Authority before such approval is granted and subsequently maintained.

c. Regulatory Options to Improve Airworthiness

The discussions that occurred during the meetings revealed five areas where the current regulations and procedures could be improved to clarify responsibilities of both the STC applicant and the FAA in certifying STC. Modifications to existing rules, advisory circulars and FAA Orders are proposed along with new rules and advisory material, including Special Certification Reviews of certain classes of STCs. Existing rules, ACs and FAA Orders include:

- 14 CFR 25.1529
- AC 21-40
- FAA Order 8110.4b

New rules and Advisory Material are proposed for 14 CFR 21 and also include changes to some to-be-determined Operational Rules.

There were several regulatory objectives considered in the process of defining the necessary changes to the rules and procedures. These objectives were obtained from a review of the current regulations and how they were applied in the certification of certain airplanes converted from passenger to cargo operations and the resulting lessons learned.

The first objective was the need to establish configuration control at the airplane level. It was determined that little if any review occurred on application of STCs following the initial installation and certification of an STC. This could mean that interacting STC might be installed on an airplane that could have an adverse affect on the continued airworthiness of the airplane because that interaction was never taken into account.

The second objective was to set in place a mechanism to determine if an STC is complex. This would most likely be the responsibility of the applicant and it is the first step in identifying situations that may require additional certification type activity on subsequent STC installations.

The third objective was to define the responsibilities of the STC holder in respects to continued airworthiness. While this objective is difficult to enact, it was felt by the AAWG to be an essential part of assignment of responsibilities and a mechanism whereby the FAA could establish STC ownership requirements.

The fourth objective was like the first but makes a broader statement as to who owns the responsibility for configuration control and STC compatibility of the proposed modification. This objective changes the responsibility from the installer to the Certificate Holder /STC Holder / Applicant.

The fifth objective will institute a review and amendment (as necessary) of all continued airworthiness programs following and STC installation to assure that those programs contain the necessary changes to account for the installation. This would include accounting for the effects of any other STC installed on the airplane.

The last objective would be to require STC applicants to include information in the ICA that defines the regions structurally affected (loads, stress distributions etc) by the STC.

Section 9 - Conclusions

The AAWG reviewed the certification and application of STC to airplanes and found the following issues.

1. The AAWG found that subsequent to certification and application to the first airplane, the application of an approved structural STC to another airplane could be made without a conformal review of that airplane's configuration. Without such a review, there is no guarantee that the certified configuration of the structural STC is compatible with the airplane configuration. There may be other STCs, repairs, service bulletins installed and/or Airworthiness Directives in effect on that airplane that might adversely affect the validity of the proposed structural STC or visa versa.

2. The AAWG found that a new classification of a STC should be introduced known as a Complex Supplemental Type Certificate. An STC is considered complex if it:

a. Alters the design loads (static and/or fatigue) that affect a significant portion of the airplane structure, and/or
b. Causes a change to the approved instructions for continued airworthiness, the Airplane Flight Manual and/or the Weight and Balance Manual, and

Note: A CSTC May or may not physically modify the airplane structure.

3. While the AAWG found that current procedures for certification of an STC are sufficient and do not require modification, there are procedural changes required for STCs classified as CSTCs.

4. The AAWG found that the guidance material defining the responsibility of the STC applicant is lacking in that it did not define the applicant's responsibility for continued airworthiness issues.

5. The AAWG found that the responsibility for configuration control of the airplane is vague and misleading and needs to be strengthened.

6. Considering the findings, the AAWG concluded that additional Special Certification Reviews should be conducted for situations where multiple CSTCs may have been installed to validate that the continued airworthiness programs have been properly updated.

7. The AAWG found differences in the means JAA and FAA administrate the granting and transferring of STCs. While the differences are cultural in nature, it is deemed that the process was equivalent in intent.

Section 10 – Recommendations

Considering the regulatory objectives contained in Section 8(c), the AAWG recommends that the Aviation Rulemaking Advisory Committee (ARAC), Transport Airplane and Engine Issues Group (TAEIG) consider enacting the following changes to ensure proper consideration of how an STC might interact and affect aging airplane and continued airworthiness programs.

A. The existing STC Limitations and Conditions template should be revised. The current wording implies that it is the installer's responsibility to ensure that the incorporated STC does not introduce any adverse effects on the airplane. It is the recommendation of the AAWG that this responsibility be placed with the Operator/STC holder/Installer. This includes configuration control, STC compatibility with actual airplane, and continued airworthiness in regard to the STC design and application. This will require a new 14 CFR 21 rule with a revision to AC 21-40, new operating rules with an advisory circular (AC), and a change to Order 8110.4b.

B. Require a special identification of complex STCs, where the installation may result in interaction effects with other complex STCs. The recommendation would require the determination of a complex STC by applicants for new STCs. This will require a new 14 CFR 21 rule, revision to Order 8110.4b and AC 21-40.

C. Establish a set of criteria to consider in evaluating interaction effects amongst complex STCs. This recommendation would require the development of an FAA Order and possibly some advisory material.

D. Require all STC applicants to provide information within the Instructions for Continued Airworthiness of the regions and areas affected by the proposed STC. This will require a new part 21 rule, possible revision to § 25.1529, Appendix H, revision to AC 21-40 and Order 8110.4b.

E. The AAWG further recommends that the FAA conduct a Special Certification Review of those items (listed below) categorically classified as CSTCs to determine any additional maintenance actions required as a result of interactions not considered when the CSTC was installed:
   a. Hush kits,
   b. Winglets,
   c. Auxiliary fuel tanks,
   d. Re-engine,
   e. Weight increases,
   f. PAX cargo conversions
   g. Reinforced Flight Deck Doors

F. The AAWG recommends that the FAA and JAA regulations specific to

certification and continued airworthiness of STCs and CSTCs be harmonized to the extent possible.

Appendix A – ARAC Tasking Statement

16089 Federal Register / Vol. 66, No. 56 / Thursday, March 22, 2001 / Notice

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration Aviation Rulemaking Advisory Committee; Transport Airplane and Engine Issues—New Task AGENCY: Federal Aviation Administration (FAA), DOT. ACTION: Notice of new task assignment for the Aviation Rulemaking Advisory Committee (ARAC). SUMMARY: The FAA assigned the Aviation Rulemaking Advisory Committee a new task to study the effects of multiple complex structural supplemental type certification (STC) modifications installed on transport category airplanes. The ARAC will develop a report with recommendations for a long-term plan addressing the effects of multiple complex STC modifications on the structural integrity and continued safe operations of transport category airplanes. This notice is to inform the public of this ARAC activity.

FOR FURTHER INFORMATION CONTACT: John McGraw, 1601 Lind Ave., Renton, Washington 98055–4056, 425–227– 1171, john.mcgraw@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA established an Aviation Rulemaking Advisory Committee to provide advice and recommendations to the FAA Administrator on the FAA's rulemaking activities with respect to aviation-related issues.

The Task

Study the effects of multiple complex structural STC modifications installed on transport category airplanes. Develop a report with recommendations for a long term plan addressing the effects of multiple complex STC modifications on the structural integrity and continued safe operation of transport category airplanes, and the ability of the operators to accomplish mandatory FAA aging fleet programs.

The report should identify the types of structural modifications considered to be complex STC modifications, and should propose recommended actions to be taken by the FAA to address the effects complex structural STC modifications have on the structural integrity and continued safe operation of modified airplanes.

The report and recommendations should contain the following:

1. A description of FAA and industry actions necessary to identify the interaction effects of multiple complex STC modifications,

2. A description of FAA and industry actions that will address the effects that complex modifications have on aging aircraft issues, and

3. A description of FAA and industry actions necessary to address the effects that complex modifications have on FAA mandated airworthiness actions (i.e., airworthiness directives, aging aircraft programs).

Schedule: The report should be completed no later than September 28, 2002.

ARAC Acceptance of Tasks

ARAC accepted the task and assigned the task to the Airworthiness Assurance Working Group, Transport Airplane and Engine Issues. The working group will serve as staff to ARAC and assist in the analysis of the assigned task. ARAC must review and approve the working group's recommendations. If ARAC accepts the working group's recommendations, it will forward them to the FAA.

Working Group Activity

The Airworthiness Assurance Working Group is expected to comply with the procedures adopted by ARAC. As part of the procedures, the working group is expected to:

1. Recommend a work plan for completion of the task, including the rationale supporting such a plan for consideration at the next meeting of the ARAC on transport airplane and engine issues held following publication of this notice.

2. Give a detailed conceptual presentation of the proposed recommendations prior to proceeding with the work stated in item 3 below.

3. Draft the appropriate documents and required analyses and/or any other related materials or documents the working group determines to be appropriate.

4. Provide a status report at each meeting of the ARAC held to consider transport airplane and engine issues. Participation in the Working Group The Airworthiness Assurance Working Group will be composed of technical experts having an interest in the assigned task. A working group member need not be a representative or a member of the full committee.

An individual who has expertise in the subject matter and wishes to become a member of the working group should write to the person listed under the caption FOR FURTHER INFORMATION CONTACT expressing that desire, describing his or her interest in the task, and stating the expertise he or she would bring to the working group. All requests to participate must be received no later than April 30, 2001. All requests will be reviewed by the assistant chair, the assistant executive director, and the working group chair. Individuals will be advised whether or not the request can be accommodated. Individuals chosen for membership on the working group will be expected to represent their aviation community segment and actively participate in the working group (e.g., attend all meetings, provide written comments when requested to do so, etc.). They also will be expected to devote the resources necessary to support the working group in meeting any assigned deadlines. Members are expected to keep their management chain and those they may represent advised of working group activities and decisions to ensure that the agreed technical solutions do not conflict with their sponsoring organization's position when the subject being negotiated is presented to ARAC for approval.

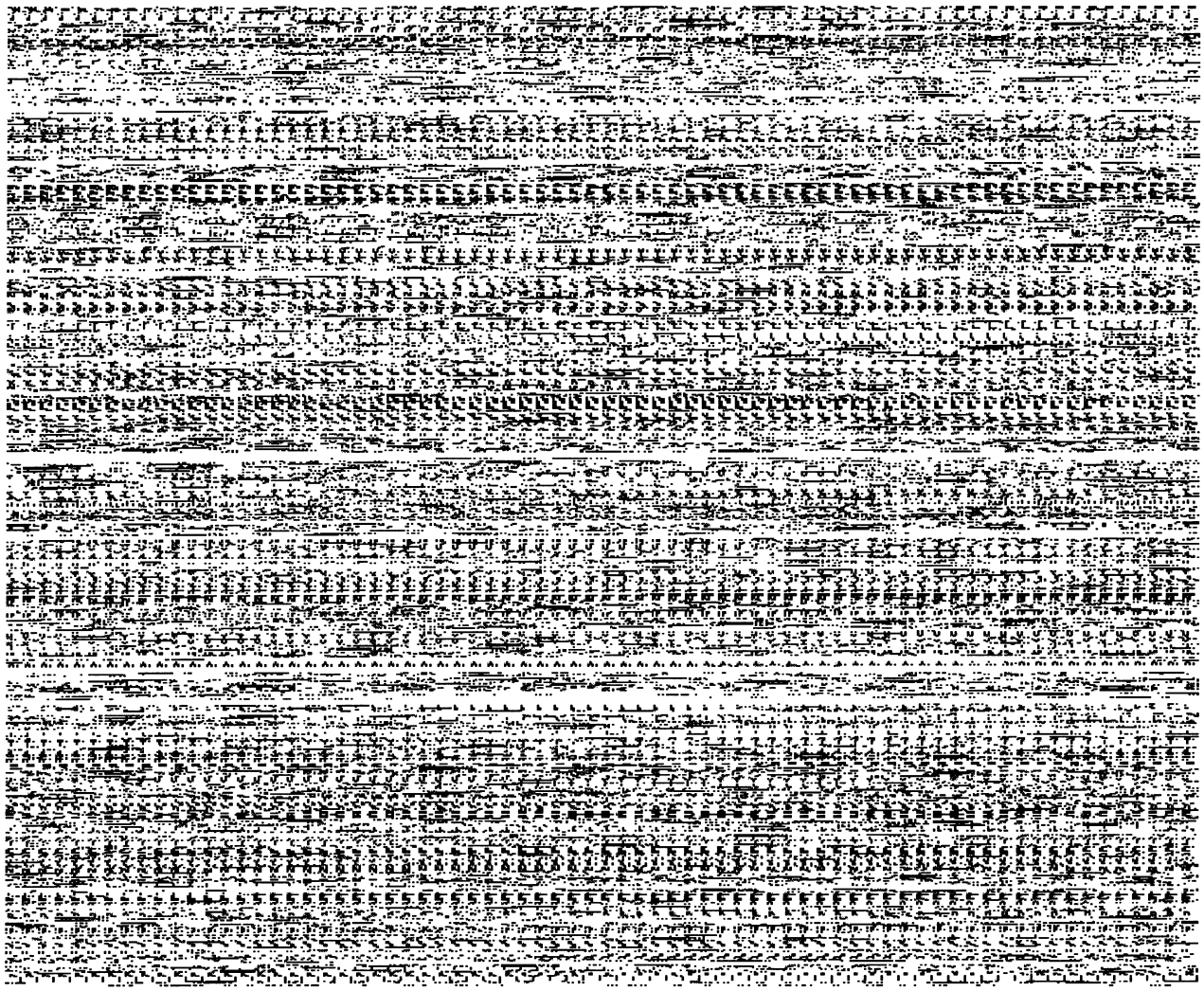
Once the working group has begun deliberations, members will not be added or substituted without the approval of the assistant chair, the assistant executive director, and the working group chair.

The Secretary of Transportation determined that the formation and use of the ARAC is necessary and in the public interest in connection with the performance of duties imposed on the FAA by law.

Meetings of the ARAC will be open to the public. Meetings of the Airworthiness Assurance Working Group will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. The FAA will make no public announcement of working group meetings.

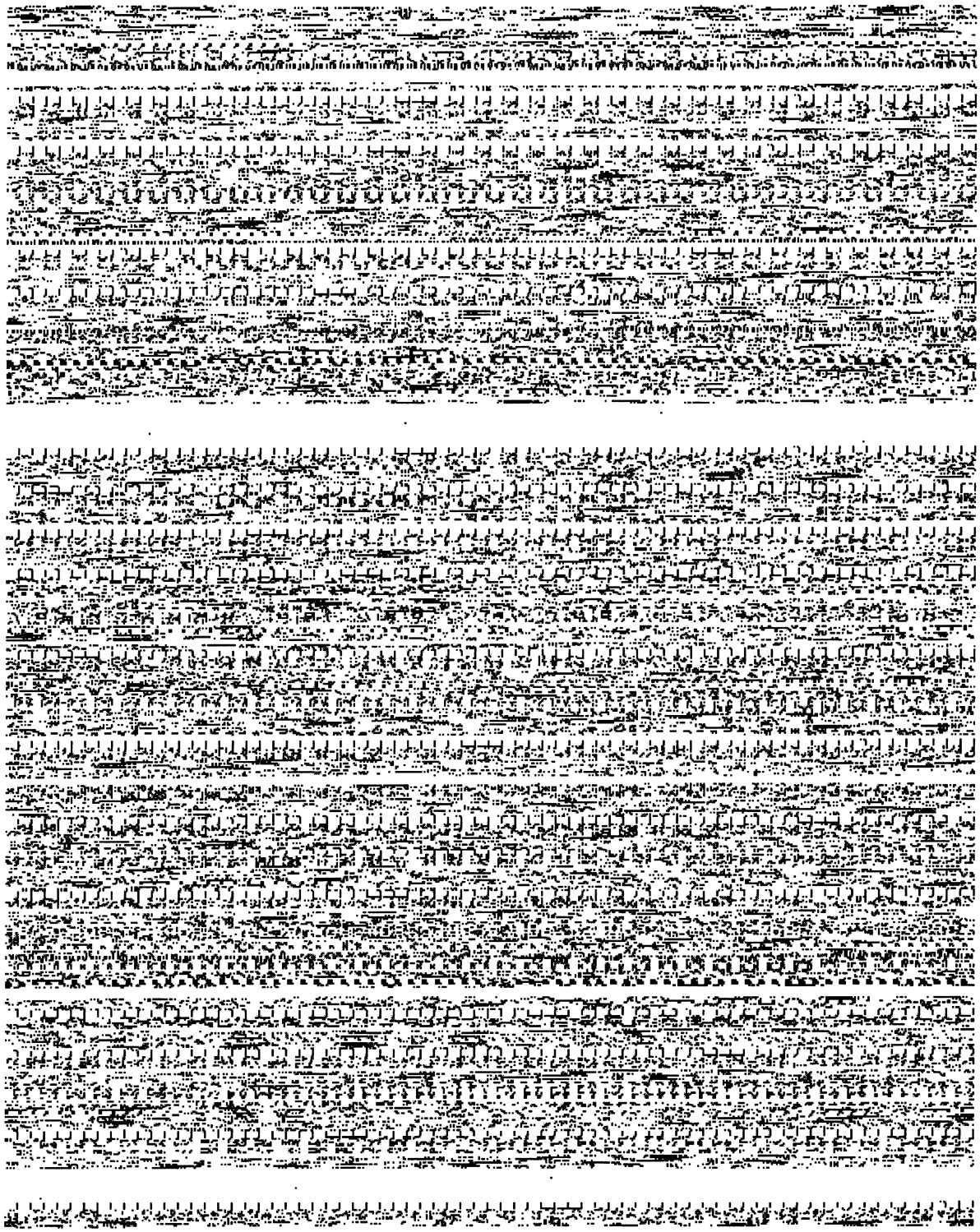
Issued in Washington, DC, on March 14, 2001.
Anthony F. Fazio,
Executive Director, Aviation Rulemaking Advisory Committee.
[FR Doc. 01–7068 Filed 3–21–01; 8:45 am]
BILLING CODE 4910–13–M

Appendix B - AAWG Task Group Make-up



Appendix C - Meeting Venues

Appendix D – Meeting Attendance



the FDA review and approval of a New Animal Drug Application or New Drug Application.

(g)–(z) [Reserved]

Dated: December 5, 2007.

Lloyd C. Day,

Administrator, Agricultural Marketing Service.

[FR Doc. E7–23915 Filed 12–11–07; 8:45 am]

BILLING CODE 3410–02–P

FEDERAL RESERVE SYSTEM

12 CFR Part 220

[Regulation T; Docket No. R–1301]

Credit by Brokers and Dealers

AGENCY: Board of Governors of the Federal Reserve System.

ACTION: Final rule; correcting amendment.

SUMMARY: The Board of Governors of the Federal Reserve System (Board) is amending Regulation T (Credit by Brokers and Dealers) to correct a cross-reference in one of its interpretations.

DATES: *Effective Date:* December 12, 2007.

FOR FURTHER INFORMATION CONTACT: Scott Holz, Senior Counsel, Legal Division (202–452–2966). For users of the Telecommunications Device (TDD) only, please call 202–263–4869.

SUPPLEMENTARY INFORMATION: The National Securities Markets Improvement Act of 1996 (NSMIA). (Pub. L. 104–290, 110 Stat. 3416) amended section 7 of the Securities Exchange of 1934 (15 U.S.C. 78g) to limit the Board's authority to impose restrictions on credit extended, maintained, or arranged to or for a member of a national securities exchange or a registered broker or dealer, a substantial portion of whose business consists of transactions with persons other than brokers or dealers, or to finance its activities as a market maker or an underwriter. Restrictions on these types of credit were found at that time in Regulations G, T and U (12 CFR Parts 207, 220, and 221, respectively).

NSMIA gave the Board the authority to maintain or adopt restrictions on these types of credit if it determines that such action is necessary or appropriate in the public interest or for the protection of investors. In November 1996, the Board adopted an interpretation of its margin regulations (1996 interpretation), indicating that the Board had not made such a finding (61 FR 60166, November 26, 1996). The 1996 interpretation stated the Board's belief that the restrictions on these types of credit found in the Regulations G, T and U had been superseded by NSMIA.

NSMIA also repealed section 8(a) of the Securities Exchange Act of 1934, dealing with extensions of credit to brokers and dealers collateralized with exchange-traded securities. The Board's 1996 interpretation indicated that the provisions in Regulations G, T and U adopted to implement section 8(a) of the Securities Exchange Act of 1934 were without effect in light of NSMIA.

The text of the 1996 interpretation was published as part of Regulation G, and Regulations T and U were amended with interpretations that referred to the text of the 1996 interpretation appearing in Regulation G.

In 1998, the Board adopted regulatory amendments to remove the restrictions that conflicted with NSMIA (63 FR 2806, January 16, 1998). As part of this process, the Board amended the 1996 interpretation to delete references to the conflict between the regulations and NSMIA. The remaining provisions of Regulation G, including the amended 1996 interpretation, were incorporated into Regulation U. However, the reference in Regulation T to the text of the 1996 interpretation was inadvertently not changed to reflect the elimination of Regulation G. Today's action will correct this cross-reference by amending Regulation T to reflect the fact that the text of the amended 1996 interpretation now appears in Regulation U.

List of Subjects in 12 CFR Part 220

Banks, banking, Brokers, Credit, Federal Reserve System, Margin, Margin requirements, Reporting and recordkeeping requirements, Securities.

■ For the reasons set forth in the preamble, part 220 is amended to read as follows:

PART 220—CREDIT BY BROKERS AND DEALERS (REGULATION T)

■ 1. The authority citation for part 220 continues to read as follows:

Authority: 15 U.S.C. 78c, 78g, 78q, and 78w.

§ 220.132 [Amended]

■ 2. In § 220.132, introductory paragraph, replace the phrase ''§ 207.114'' with ''§ 221.125.''

By order of the Secretary of the Board, acting pursuant to delegated authority for the Board of Governors of the Federal Reserve System, December 7, 2007.

Jennifer J. Johnson,

Secretary of the Board.

[FR Doc. E7–24052 Filed 12–11–07; 8:45 am]

BILLING CODE 6210–01–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 26, 121, and 129

[Docket No. FAA–2005–21693; Amendment Nos. 26–1, 121–337, 129–44]

RIN 2120–AI32

Damage Tolerance Data for Repairs and Alterations

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This final rule requires holders of design approvals to make available to operators damage tolerance data for repairs and alterations to fatigue critical airplane structure. This rule will support operator compliance with the Aging Airplane Safety final rule with respect to the requirement to incorporate into the maintenance program, a means for addressing the adverse effects repairs and alterations may have on fatigue critical structure. The intent of this final rule is to ensure the continued airworthiness of fatigue critical airplane structure by requiring design approval holders to support operator compliance with specified damage tolerance requirements.

DATES: These amendments become effective January 11, 2008.

FOR FURTHER INFORMATION CONTACT: If you have technical questions about this action, contact Greg Schneider, ANM–115, Airframe and Cabin Safety, Federal Aviation Administration, 1601 Lind Avenue, SW., Renton, Washington 98057–3356, telephone: (425–227–2116); facsimile (425–227–1232); e-mail *greg.schneider@faa.gov.* Direct any legal questions to Doug Anderson, ANM–7, Office of Regional Counsel, Federal Aviation Administration, 1601 Lind Avenue, SW., Renton, WA 98057–3356; telephone (425) 227–2166; facsimile (425) 227–1007; e-mail *Douglas.Anderson@faa.gov.*

SUPPLEMENTARY INFORMATION:

Authority for This Rulemaking

The FAA's authority to issue rules regarding aviation safety is found in Title 49 of the United States Code. Subtitle I, Section 106 describes the

authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency's authority.

This rulemaking is promulgated under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, ''General requirements.'' Under that section, the FAA is charged with promoting safe flight of civil aircraft in air commerce by prescribing minimum standards required in the interest of safety for the design and performance of aircraft; regulations and minimum standards in the interest of safety for inspecting, servicing, and overhauling aircraft; and regulations for other practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it prescribes—

- New safety standards for the design of transport category airplanes, and
- New requirements necessary for safety for the design, production, operation, and maintenance of those airplanes, and for other practices, methods, and procedures relating to those airplanes.

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I. Executive Summary

Fatigue cracking has been a major aviation safety concern for many years. Unless detected and repaired, fatigue cracks can grow to the point of catastrophic failure. Since 1978 the FAA has required new types of airplanes to meet damage tolerance [1] (DT) requirements to ensure their continued airworthiness. Industry has also used this method successfully to develop inspection programs for older airplanes. Since the 1980s, the FAA has mandated that operators of most large transport airplanes carry out these programs.

While these programs have been largely effective, industry has not carried out DT methods comprehensively. In particular, while these programs apply to the airplane ''baseline'' structure (the airplane structure as originally manufactured), they often do not apply to repairs and alterations.[2] This omission is important because airplanes are subject to many repairs and alterations throughout their operational lives. If fatigue cracking occurs in a repaired or altered area, the results can be just as catastrophic as if it had occurred in the baseline structure.

The FAA adopted the Aging Airplane Safety final rule (AASFR) [3] in early 2005. Among other things, the AASFR requires airline operators of certain large transport category airplanes [4] to implement DT-based inspection programs for airplane structure; that is, structure susceptible to fatigue cracking that could contribute to a catastrophic failure. In this final rule, we refer to this structure as ''fatigue critical structure.'' Most importantly for this rule, the AASFR requires these inspection programs to ''take into account the adverse effects repairs, alterations, and modifications may have on fatigue cracking and the inspection of this airplane structure.''

With the AASFR, we now have in place the regulatory means to provide for comprehensive implementation of DT methods on all large transport airplanes used by air carriers. To carry out these requirements fully, however, it is necessary to place corresponding requirements on the holders of FAA design approvals for these airplanes. Otherwise, the operators may not be able to obtain the data and documents they need to comply with the AASFR. As the owners of the data for these airplanes, the design approval holders [5] (DAHs) are in the best position to identify the fatigue critical structure and the methods and frequency of inspections that may be needed. Therefore, this final rule requires DAHs to develop and make available to operators the data and documents they need to support compliance with the DT requirements of the AASFR.

Specifically, this final rule requires DAHs to develop and make available the following four types of documents to operators:

(1) Lists of fatigue critical structure (to aid operators in identifying repairs and alterations that need to be addressed for DT).

(2) Damage tolerance inspections to provide operators with the necessary inspection times and methods for the following:

- Repair data published by type certificate (TC) holders.[6]
- TC holder's future repair data not published for general use.[7]
- Repair data developed by supplemental type certificate (STC) holders.
- Alteration data developed by TC and STC holders.

(3) Damage tolerance evaluation guidelines for all other repairs (to enable operators to obtain the necessary damage tolerance inspections).

(4) Implementation schedules (to define the necessary timing for performing damage tolerance

[1] Damage tolerance (DT) is a method used to evaluate the crack growth and residual strength characteristics of structure. Based on the results, inspections or other procedures are established as necessary to prevent catastrophic failures due to fatigue. Most commonly, the maintenance actions developed are directed inspections for fatigue cracking.

[2] Various segments of industry use the term ''modification'' to define a design change. We consider this term to be synonymous with the term ''alteration.'' We use both terms in this rule to mean a design change that is made to an airplane.

[3] 70 FR 5518; February 2, 2005.

[4] The rule applies to turbine powered airplane models with a maximum type certificated passenger seating capacity of 30 or more, or a maximum payload capacity of 7,500 pounds or more.

[5] For purposes of this rule, design approval holders (DAHs) are holders of type certificates (TCs) or supplemental type certificates (STCs) issued under 14 CFR part 21.

[6] Published repair data are instructions for accomplishing repairs, which are published for general use in structural repair manuals (SRMs) and service bulletins. These data are approved for general application to a particular airplane model or airplane configuration.

[7] This includes repairs that are developed for individual airplanes at the request of an operator. These repairs are often complex or unique to a particular airplane or group of airplanes experiencing similar damage conditions.

evaluations and developing damage tolerance inspections and for incorporating the DT data into the operator's maintenance program).

This final rule transfers the responsibility for developing DT-based data from operators to DAHs and, therefore, has minimal to no societal costs. The aviation industry as a whole would also benefit because DAHs could amortize their development costs for DT data over a larger fleet.

II. Background

A. Summary of the NPRM

1. The Proposed Rule

On April 21, 2006, the FAA published in the **Federal Register** the Notice of proposed rulemaking (NPRM) entitled, Damage Tolerance Data for Repairs and Alterations (DAH DT Data NPRM),[8] which is the basis of this final rule.

In the DAH DT Data NPRM, the FAA proposed to require DAHs to develop and make available to operators certain damage tolerance (DT) data that address the adverse effects repairs, alterations, and modifications may have on fatigue critical structure. These data are necessary to support operator compliance with the Aging Airplane Safety Final Rule (AASFR).[9] Specifically, we proposed to require DAHs to develop and make available to operators the following: (1) Lists of fatigue critical structure for baseline and alteration structure; (2) Damage tolerance inspections (DTIs) for existing published repair and alteration data; (3) DTIs for future repair and alteration data; (4) Repair evaluation guidelines (REGs) that include a process for conducting airplane surveys, a process for establishing DT Data, and implementation schedules for the above actions. In addition, we proposed to require DAHs to develop a compliance plan for meeting these four requirements and to obtain FAA approval of the plan.

The NPRM contains the background and rationale for this rulemaking and, except where we have made revisions in this final rule, you should refer to it for that information.

2. Related Activities

In July 2004, we published the Fuel Tank Safety Compliance Extension (Final Rule) and Aging Airplane Program Update (Request for Comments),[10] where we informed the public of our intent to propose DAH airworthiness requirements to support certain operational rules. We requested comments on our proposal.

In December 2002, we published the Aging Airplane Safety Interim final rule; request for comments.[11] In February 2005, we adopted the AASFR in which we responded to the comments from the interim rule and made some changes to that rule. The February 2005 AASFR requires affected operators to include certain damage tolerance inspections and procedures in their maintenance programs by December 20, 2010. Today's final rule is directly related to the AASFR in that it provides a means for operators to get the data and documents they need to comply with the AASFR.

In July 2005, we published a disposition of comments document,[12] in which we responded to comments to the July 2004 action. Also in July 2005, we published a policy statement, Safety—A Shared Responsibility—New Direction for Addressing Airworthiness Issues for Transport Airplanes,[13] that explains our criteria for adopting DAH requirements like those described in this final rule.

On April 21, 2006,[14] along with the NPRM for this rulemaking, we published a Notice of Availability (NOA) and request for comments on draft AC 120–XX[15] (Damage Tolerance Inspections for Repairs). This AC included guidance related to repairs, which the Aviation Rulemaking Advisory Committee's (ARAC) Airworthiness Assurance Working Group (AAWG)[16] developed.

On July 7, 2006, we published a notice[17] that granted industry a 90-day extension to comment on the NPRM; and on February 27, 2007, we published a NOA[18] and request for comments on revised AC 120–XX,[19] which includes guidance from the AAWG on both repairs and alterations.

B. Differences Between the NPRM and the Final Rule

1. New Part 26 for Design Approval Holders' Airworthiness Requirements

In the NPRM (and other Aging Airplane Program rules), we placed the DAH airworthiness requirements in part 25, subpart I. As we explained in the recently adopted Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety final rule (EAPAS/FTS),[20] we have placed these requirements in new part 26, and we have moved the enabling regulations into part 21.[21] We determined that this was the best course of action because it keeps part 25 as strictly airworthiness standards for transport category airplanes, thus maintaining harmonization and compatibility among the United States, Canada, and the European Union regulatory systems. Providing references to part 26 in part 21 clarifies how the part 26 requirements will address existing and future design approvals.

In creating new part 26, we renumbered the proposed sections of part 25, subpart I and we incorporated the changes discussed in this preamble. A table of this renumbering is shown below.

TABLE 1.—RELATIONSHIP OF PROPOSED PART 25 SUBPART I TO PART 26 FINAL RULES

Part 26 final rules	Proposed part 25
Subpart E—Aging Airplane Safety—Damage Tolerance Data for Repairs and Alterations.	Subpart I—Continued Airworthiness.
§ 26.5 Applicability table.	New.[22]
§ 26.41 Definitions	New.[23]
§ 26.43 Holders of and applicants for type certificates—Repairs.	§ 25.1823 Holders of type certificates—Repairs.
§ 26.45 Holders of type certificates—Alterations and repairs to alterations.	§ 25.1825 Holders of type certificates—Alterations and repairs to alterations.
§ 26.47 Holders of and applicants for a supplemental type certificate—Alterations and repairs to alterations.	§ 25.1827 Holders of and applicants for a supplemental type certificate—Alterations and repairs to alterations.

[8] 71 FR 20574.

[9] AASFR: 70 FR 5518; February 2, 2005. See also 70 FR 23935; May 6, 2005: Aging Airplane Safety; Correcting Amendment.

[10] 69 FR 45936; July 30, 2004.

[11] 67 FR 72726; December 6, 2002.

[12] 70 FR 40168; July 12, 2005: Fuel Tank Safety Compliance Extension (Final Rule) and Aging Airplane Program Update (Request for Comments).

[13] 70 FR 40166, July 12, 2005 (PS–ANM110–7–12–2005).

[14] 71 FR 20750.

[15] Issued as AC 120–93.

[16] AAWG Member Organizations: Boeing Commercial Airplanes, Federal Express (FedEx), Airbus, Air Transport Association (ATA), American Airlines, British Airways, Continental Airlines, Japan Airlines, Northwest Airlines, United Airlines, United Parcel Service (UPS), Airborne Express, U.S. Airways, Federal Aviation Administration (FAA), and European Aviation Safety Agency (EASA).

[17] 71 FR 38541.

[18] 72 FR 8834.

[19] Issued as AC 120–93.

[20] 72 FR 63364; November 8, 2007.

[21] Certification Procedures for Products and Parts.

[22] This section, which includes an applicability table for part 26, was adopted as part of the EAPAS final rule.

[23] These definitions were proposed in § 25.1823(b).

TABLE 1.—RELATIONSHIP OF PROPOSED PART 25 SUBPART I TO PART 26 FINAL RULES—Continued

Part 26 final rules	Proposed part 25
§ 26.49 Compliance Plan.	§ 25.1829 Compliance Plan.

2. New Subparts for Airworthiness Operational Rules

We discussed in the preamble to the proposed rule that we would establish new subparts for airworthiness-related operational rules. Since there were several other aging airplane proposals (e.g., EAPAS) published around the same time, each proposal contained language that established the new subparts and redesignated certain sections of those rules. We said when any one of those proposals became a final rule, we would remove the duplicative provisions that established the new subparts and redesignated sections from the other aging airplane rules. In the DAH DT Data proposal, we included regulatory text to add subparts AA and B (Continued Airworthiness and Safety Improvements) to include the airworthiness requirements from parts 121 and 129, respectively. We also included regulatory language to redesignate the section numbers in parts 121 and 129 that were moved to the new subparts. However, since the EAPAS final rule was the first to be codified, that final rule adopted subparts AA and B and redesignated appropriate sections of parts 121 and 129. Therefore, we have removed the duplicative regulatory text from this final rule.

To aid understanding of our discussion about the DAH DT Data rule as it relates to the AASFR, we have indicated below the prior and redesignated sections of parts 121 and 129 of the AASFR that include DT-related requirements.

Prior sections	Redesignated sections
§ 121.370a	§ 121.1109
§ 129.16	§ 129.109

3. Minor Conforming Changes to the Aging Airplane Safety Final Rule

During the rulemaking process for the DAH DT Data rule, the FAA determined that minor changes to the AASFR were needed to ensure clarity of the two rules. The original wording in §§ 121.370a and 129.16 (redesignated as §§ 121.1109 and 129.109, respectively) required that changes to the certificate holder's maintenance program (i.e., inclusion of DT-based inspections and procedures and any revisions to them) be approved by the Aircraft Certification Office (ACO) [24] or office of the Transport Airplane Directorate with oversight responsibility for the relevant type certificate or supplemental type certificate, as determined by the Administrator.

Although the ACO will approve the documentation that the DAH DT Data final rule requires DAHs to submit to the FAA, the DT inspections and procedures resulting from this documentation, which certificate holders must incorporate into their maintenance programs, should be approved by their Principal Maintenance Inspector (PMI). Therefore, we revised §§ 121.1109 and 129.109 to state that it is the PMI's responsibility to review and approve changes to a certificate holder's maintenance program.

Also, we believe the requirements in current §§ 121.1109(c)(1) and 129.109(b)(1) that address DT relative to baseline structure and repairs, alterations, and modifications would be clearer if they were in separate paragraphs. Therefore, we revised §§ 121.1109 and 129.109 to include requirements related to baseline structure in § 121.1109(c)(1) and § 129.109(b)(1) and those related to repairs, alterations, and modifications in § 121.1109(c)(2) and § 129.109(b)(2). We also made minor wording changes for clarity and consistency with the new part 26 requirements and Advisory Circular (AC) 120–XX,[25] which describes an acceptable means of compliance with the DAH DT Data final rule.

4. Other Miscellaneous Changes

Based on comments to the proposed rule, we have revised the final rule as summarized below and discussed in more detail under the Discussion of the Final Rule heading.

We extended the compliance times for DAHs to develop the required lists of fatigue critical structure. For TC holders, we extended the compliance date for them to submit their lists of fatigue critical baseline structure to the FAA Oversight Office for review and approval from 90 to 180 days after the effective date of the final rule. We also added a provision that makes it clear to future TC holders that the lists of fatigue critical baseline structure must be submitted as part of the type certification process.

In the NPRM, we proposed TC holders submit their lists of fatigue critical alteration structure to the FAA Oversight Office for review and approval 90 days after the effective date of the final rule. We proposed 270 days for STC holders. In the final rule, we extended the compliance date to 360 days after the effective date of the final rule for both TC holders and STC holders to submit these lists.

The NPRM included a requirement for TC and STC holders to develop a process to enable operators to ''establish'' damage tolerance inspections (DTIs) for repairs and alterations to fatigue critical baseline structure (FCBS). This final rule replaces the term ''establish'' with ''obtain.'' We made this change because the term ''obtain'' better reflects the intent of the rule and is meant to be all inclusive. That is, the operator may ''obtain'' a DTI by establishing it themselves, or by receiving the DTI directly from a TC holder, STC holder, or a third party.

Section 25.1823(f)(1)(iii) (adopted as § 26.43(e)(1)(iii)) proposed an implementation schedule for repairs covered by the repair evaluation guidelines (REGs). To clarify this proposed requirement, we revised it in the final rule to specify that the implementation schedule must identify the times when actions must be taken as specific numbers of flight cycles, flight hours, or both.

We revised proposed § 25.1823(f)(3) (adopted as § 26.43(e)(3)) to remove the reference to § 25.1827. That reference would have required TC holders to make their REGs available to STC holders. We made this change because TC holders do not need to provide REGs to STC holders. However, they must provide their lists of fatigue critical structure (FCS) to STC holders.

As discussed in more detail later in this preamble, based on comments submitted to other DAH airworthiness rules, we removed some provisions of the compliance plan in proposed § 25.1829 (adopted as § 26.49). Specifically, we removed the proposed requirements in § 25.1829(a)(3) for DAHs to identify the intended means of compliance that differ from those described in FAA advisory materials. Similarly, we removed the requirement in proposed § 25.1829(c) that would have authorized the FAA Oversight Office to identify deficiencies in a compliance plan or the DAH's implementation of the plan and to require specified corrective actions to remedy those deficiencies. We do not

[24] The regulatory text in this rule refers to the ACO or office of the Transport Airplane Directorate with oversight responsibility for the relevant type certificate or supplemental type certificate as the FAA Oversight Office.

[25] Issued as AC 120–93.

believe removal of these requirements will adversely affect our ability to facilitate DAH compliance.

In § 25.1829(5), we proposed a requirement for including in the compliance plan a process for continuous assessment of service information related to structural fatigue damage. As discussed later in this preamble, we have determined that existing regulations should enable us to determine whether the objectives of this DAH DT Data final rule are being met. Therefore, we have removed this provision from this final rule.

In addition to the changes discussed above, we made minor changes to clarify the definitions of damage tolerance inspections and published repair data in proposed § 25.1823 (the definitions are now in § 26.41). We also made other minor changes to clarify the requirements in proposed §§ 25.1823 (adopted as § 26.43), 25.1825 (adopted as § 26.45), 25.1827 (adopted as § 26.47), and 25.1829 (adopted as § 26.49).

C. Summary of Comments

The FAA received multiple comments from 17 commenters, including the Air Transport Association (ATA) and a collective group of certain industry representatives who are members of the AAWG.[26] In the following discussion of the comments received to the proposed rule, we will refer to the comments received from those industry representatives of the AAWG as the ''AAWG industry representatives.'' Also, several of the AAWG and the ATA member organizations sent separate comments on behalf of their organizations, with some specifically expressing support for the comments submitted by the AAWG industry representatives and the ATA. The comments to the proposed rule covered an array of topics and contained a range of responses, which we discuss more fully below under the Discussion of the Final Rule heading. In general, commenters supported the intent of the rule and the guidance material. They also requested some changes and clarifications.

Many of the comments to the proposed rule concerned issues specific to the Widespread Fatigue Damage (WFD)[27] proposal. The FAA intends to address the WFD-related comments in a separate action, so we will not address them here.

We also received several comments about the DAH airworthiness requirements. We addressed many of the same or similar comments and issues in the July 2005 disposition of comments document to the Fuel Tank Safety Compliance Extension (Final Rule) and Aging Airplane Program Update (Request for Comments). In addition, we explained in detail the need for these requirements in our July 2005 policy statement. As a result, we will not revisit those comments and issues here.

III. Discussion of the Final Rule

A. Overview

1. Final Rule

Fatigue cracking has been a major aviation safety concern for many years. Unless detected and repaired, fatigue cracks can grow to the point of catastrophic failure. Since the adoption of Amendment 25–45[28] in 1978, the FAA has required new types of airplanes to meet damage tolerance (DT) requirements to ensure their continued airworthiness. Industry has also used this method successfully to develop inspection programs for older airplanes, such as Supplemental Structural Inspection Programs (SSIP). Since the 1980s, the FAA has mandated that operators of most large transport airplanes carry out these programs.

Although these programs have been effective for baseline structure (the airplane structure as originally manufactured), industry has not comprehensively implemented DT methods for repairs and alterations. For airplanes certified to Amendment 25–45 and later, repairs and alterations were not always evaluated for damage tolerance. This omission is important because airplanes are subject to many repairs and alterations throughout their operational lives. If fatigue cracking occurs in a repaired or altered area, the results can be just as catastrophic as if it had occurred in the baseline structure.

The AASFR requires airline operators of certain large transport category airplanes[29] to implement DT-based inspection programs for airplane structure; that is, structure susceptible to fatigue cracking that could contribute to a catastrophic failure. In today's DAH DT Data final rule, we refer to this structure as ''fatigue critical structure.'' Most importantly for today's DAH DT Data final rule, the AASFR requires the maintenance program for the airplane include a means to address the adverse effects repairs and alterations may have on airplane structure.

With the AASFR, we now have in place the regulatory means to provide for comprehensive implementation of DT methods on all large transport category airplanes used by air carriers operating under 14 CFR parts 121 and 129. To carry out these requirements fully, however, we must place corresponding requirements on the holders of FAA design approvals for these airplanes. Otherwise, the operators may not be able to obtain the data and documents they need to comply with the AASFR. As the owner of the design data for these airplanes, the DAH is in the best position to identify the fatigue critical structure and the methods and frequency of inspections that may be needed.

As indicated in our July 2005 policy statement about the shared responsibility for addressing airworthiness issues, in cases where operators must rely on data or documents from DAHs to comply with operational rules, we will require DAHs to develop that information by a specified date. This final rule includes such requirements.

Specifically, 14 CFR 26.43, 26.45, and 26.47 require that the TC holders and STC holders develop certain information that will provide a means for operators to address the adverse effects of repairs and alterations. The information required by this final rule includes the following:

- List of Fatigue Critical Structure (baseline and alteration).
- Damage tolerance inspections (DTIs) for existing published repair data and all future repair data.
- DTIs for all existing and future alteration data.
- Repair evaluation guidelines (REGs), which include—

—Instructions for conducting airplane surveys;

—Instructions an operator uses to obtain DTIs; and

—An implementation schedule that provides timing for the above actions.

2. Guidance Material

The FAA has issued Advisory Circular (AC) 120–93, Damage Tolerance of Repairs and Alterations, concurrently with this rule. The AC provides TC and STC holders with an acceptable method of compliance with this final rule. The AC, which was developed through a collaborative effort between the FAA and the Aviation Rulemaking Advisory Committee

[26] AAWG industry representatives (a collective group of commenters who are members of the AAWG): Boeing Commercial Airplanes, Federal Express (FedEx), Airbus, American Airlines, British Airways, Continental Airlines, Japan Airlines, Northwest Airlines, United Airlines, United Parcel Service (UPS), Airborne Express, US Airways.

[27] 71 FR 19928; April 18, 2006.

[28] 43 FR 46242; October 5, 1978.

[29] The rule applies to turbine powered airplane models with a maximum type certificated passenger seating capacity of 30 more, or a maximum payload capacity of 7,500 pounds or more.

(ARAC), supports operator compliance with the AASFR with respect to repairs and alterations.

As amended by this final rule, § 121.1109(c)(2) of the AASFR requires operators to incorporate into their maintenance program a ''means'' for addressing the adverse effects that repairs and alterations may have on fatigue critical structure. This AC provides guidance that TC holders, STC holders, and operators can use in developing a means for addressing repairs and alterations.

To facilitate operators' timely compliance with the AASFR for repairs, the guidance material in this AC includes implementation schedules that specify acceptable time frames for when operators can incorporate required DT data into their maintenance programs. The implementation schedules allow for a phased-in program where existing repairs on the older and higher utilization airplanes are assessed first, and the newer airplanes assessed as they approach their Design Service Goal (DSG). This approach ensures that DTIs will be available when needed for both older and newer airplanes.

B. Airplane Applicability and Exceptions

This rule applies to transport category, turbine powered airplane models with an original TC issued after January 1, 1958. With certain exceptions, this rule applies to those airplanes that, as a result of the original certification or later increase in capacity, have a maximum type certificated passenger seating capacity of 30 or more or a maximum payload capacity of 7,500 pounds or more. The final rule differs from the proposal in that we revised the list of excepted airplanes to include the Lockheed L–300, deHavilland DHC–7, and Boeing 707/720 airplanes. We included these airplanes on the excepted list because they are not currently being operated in commercial service in the U.S., and we do not expect they will be in the future.

1. Airplane Certification Amendment Level

Airbus and United Parcel Service (UPS) expressed concern that the requirements of this rule duplicate certain requirements of current regulations.

Airbus said because newer airplanes like the A330/A340 and A380 have a state-of-the-art damage tolerance assessment for all activities related to baseline structure, repairs, and alterations, the TC holder's activities under proposed §§ 25.1823(d) and (e) and 25.1825(c) and (d) would be ''senseless.'' It said applying the proposed requirements to its newer model airplanes would offer no additional safety benefit because they are already inherent in the consistent application of the damage tolerance requirements in § 25.571. It also said the proposed activities for these airplane models would create an unnecessary administrative burden and would require re-approval of already DT-justified modifications and repairs. Airbus asked the FAA to reconsider applying proposed §§ 25.1823 and 25.1825 to TC holders as they relate to airplane models A330/A340/A380 and future Airbus models. It suggested addressing this issue under proposed § 25.1829 in the model-specific compliance plans.

UPS said if the proposed rule is adopted, it would force operators to survey every airplane in their fleet to find repairs and then evaluate them based on guidelines produced by TC holders. UPS believes airplanes certified to comply with Amendment 25–54 or later already have DT data developed for fatigue critical structure, which includes certain baseline structure, as well as all repairs and alterations. UPS suggested the FAA make the proposed surveys applicable only to airplanes certified prior to Amendment 25–54. To accomplish this, it said, the FAA should revise proposed § 25.1823(a) to limit the applicability to airplanes type certified to pre-Amendment 25–54 requirements.

As discussed in the NPRM, the FAA has identified several airplane models certified to Amendment 25–45 or later (including airplane models certified to Amendment 25–54) for which published repair data have not been evaluated for DT. Therefore, unless accomplished previously, a damage tolerance evaluation (DTE) needs to be accomplished for all airplanes, regardless of the certification level. For those airplanes certified to Amendment 25–45 or later that have had a DTE completed for all published repair and alteration data, the compliance plan required by § 26.49 (proposed as § 25.1829) should contain a statement to that effect, and the TC holder will need to substantiate this statement with previously approved data from their certification effort to show compliance with this rule. TC holders who have already substantiated compliance with DT requirements should not find compliance with this rule burdensome.

Regarding UPS's comment, if the TC holder can substantiate compliance for its repairs and alterations, it is still likely that operators have installed repairs and alterations that were not designed by the TC holder on many airplanes. It is also likely that many of these repairs and alterations were not assessed for damage tolerance. Therefore, a survey will still be necessary to identify those repairs and alterations and to determine if DT data are available to support operator compliance with the AASFR.

Bombardier noted that the proposed rule would apply only to DAHs for airplanes currently operated under parts 121 or 129. It said this would not change the requirement to maintain damage tolerance for all airplanes originally certified as damage tolerant under § 25.571 (Amendment 45 or later). It said it presumes these airplanes will continue to be regulated under § 25.1529, using AC 25.1529–1 as guidance (and under Canadian Air Regulations & Airworthiness Manual 511.34 for Canadian DAHs). Bombardier asserted that the four DAH deliverables required by proposed § 25.1823 (lists of fatigue critical baseline structure, damage tolerance inspections, damage tolerance evaluation guidelines, and implementation schedules) are already required under § 25.1529 (with guidance provided in AC 25.1529–1) and could constitute compliance with the proposed rule.

We agree that TC holders and others designing repairs and alterations for airplanes certificated to Amendment 25–45 or later amendments will continue to be required to comply with § 25.1529, regardless of the types of operations conducted. For airplanes subject to this DAH DT Data rule, DAHs and operators should use the guidance in AC 120–93 instead of AC 25.1529–1 for repairs. Because this rule is entirely consistent with §§ 25.571 and 25.1529, DTIs that comply with this rule will also comply with those sections. To the extent such data have been developed previously, their compliance will be simplified.

2. Parts 91, 125, and 135 Operations

Transport Canada and Mr. Thomas A. Knott expressed concern that the proposed rule only applies to airplanes operated under parts 121 and 129. Mr. Knott also stated that it leaves out airplanes operated under parts 91, 125, and 135. Transport Canada expressed concern that the DAH DT Data proposal and the AASFR do not apply to airplanes operated under part 125 and would allow airplanes such as the B727 and B747 to operate as passenger-carrying airplanes under part 125 without having to meet DT or the aging airplane safety requirements.

As we discussed earlier in this preamble, the purpose of this rule is to support parts 121 and 129 operators'

compliance with the AASFR. For the reasons discussed in the preamble to the AASFR, we limited applicability of the DT requirements (supplemental inspections) in that rule to certain large transport airplanes that are typically operated under parts 121 or 129. For the affected airplanes that are operated under parts 91, 125, or 135, their utilization is much lower and the risks associated with fatigue damage that the AASFR is intended to address is, therefore, also much lower. Because of this, we determined it would not be cost-effective to impose the AASFR's supplemental inspection requirements on parts 91, 125, or 135 operators.

3. Exception of Airplanes Not Operating in the U.S. Under Part 121 or 129

Viking Air Limited said it owns seven de Havilland heritage aircraft, including the DHC–5 Buffalo and DHC–7. Viking Air Limited said there are about 23 DHC–5s in confirmed operation, and the DHC–7 has about 66 in confirmed operation. Many of those in confirmed operation are used in military operations and are not subject to part 121 or 129. According to the FAA Registry, no DHC–5 aircraft are presently registered in the U.S. Therefore, Viking proposed that the DHC–5 be added as an exception under proposed § 25.1823(h). Viking Air Limited also said that for the DHC–7, there presently are the following safety measures in place: Canadian Airworthiness Directive CF–94–19R1 that mandates a Supplemental Inspection Program; CF–2005–36 that imposes a Structural Life Limit; and CF–98–03 that mandates the Corrosion Prevention and Control Program. With these actions, the DHC–7, the commenter stated, has already met the intentions of aging aircraft initiative for structures.

The FAA researched its data bases and found that the DHC–5 does not have a type certificate issued by the U.S. Therefore, there is no need for an exception for the DHC–5 Buffalo. Furthermore, we have determined that there are no DHC–7 airplanes currently operated under part 121 or U.S.-registered DHC–7 airplanes operated under part 129. For the reasons discussed earlier in this preamble, we added the DHC–7, as well as the Lockheed L–300 and the Boeing 707/720, to the list of excepted airplanes in § 26.43(g) of this final rule.

C. Fatigue Critical Structure (FCS)

This final rule requires TC and STC holders to evaluate their designs for baseline and alteration structure to identify FCS. They must also develop lists of FCS and make the lists available to operators.

This final rule defines fatigue critical structure as airplane structure that is susceptible to fatigue cracking that could contribute to a catastrophic failure, as determined under § 25.571. This is structure that may need special maintenance actions to manage the threat of fatigue. This would be the case for structure that has the potential to develop fatigue cracks that, without intervention, could lead to a catastrophic failure. The fatigue evaluations are performed to determine if special actions are needed and if so, to provide the data needed to define the maintenance action requirements. Fatigue critical structure may be part of the baseline structure or part of an alteration to the baseline structure. As explained in the NPRM,[30] by referencing § 25.571 in the sentence noted below, we intended to rely on the many precedents established in finding compliance with this section.

> Because of industry's extensive experience in showing compliance with the damage tolerance requirements of § 25.571, these key terms [e.g., fatigue critical structure] should be readily understood and applied.

To clarify how the criteria of § 25.571 apply within the context of this rule, we revised the definition of ''fatigue critical structure'' by adding the following language: ''Fatigue critical structure includes structure, which, if repaired or altered, could be susceptible to fatigue cracking and contribute to a catastrophic failure.''

Airbus, the ATA, and UPS, asked for a more detailed definition of fatigue critical structure. They expressed concern that, as proposed, the definition is open to varying interpretations, so it may not be applied consistently across industry or across different airplane models. UPS added that some STC holders do not have experience in complying with § 25.571. It asserted, the definition must be clear so that it can be interpreted and applied in the same manner across the industry.

The ATA and UPS said the methodology for identifying fatigue critical structure should include quantitative criteria for assessing the criticality of structural elements, based on a comparison of their operational loads to their design limit loads or ultimate loads; and it should account for load type and single- and multiple-load paths. Also, the ATA said, the methodology should define what ''could contribute'' means as stated in the definition of fatigue critical structure. It recommended possibly using criteria similar to that in § 25.1309 to clarify the definition.

The term ''fatigue critical structure,'' as explained in the proposed rule, is intended to identify the same kind of structure for which applicants must perform fatigue evaluations to comply with § 25.571.[31] These evaluations have been required for new type certificates since the adoption of Amendment 25–45 in 1978. Furthermore, AC 25–571–1C, published in 1998, provides many examples of the types of structural elements that should be evaluated. Therefore, we believe there is little, if any, room for differing interpretations of this term.

We believe many of the commenters' concerns result from differences in the way industry has used the term ''principal structural elements'' (PSEs). This term, as used in § 25.571 and AC 25.571, is synonymous with the term ''fatigue critical structure.'' That is, a PSE is structure that needs to be evaluated to determine if special maintenance actions are needed to manage fatigue. And if such actions are needed, they must be defined. The meaning of PSE in § 25.571 contrasts significantly with its usage in certain industry practices that have evolved over the years.

For some TC and STC holders, a PSE is considered to be a specific, localized area within fatigue critical structure where special, directed inspections are required by an Airworthiness Directive (AD) or airworthiness limitations. For example, all longitudinal skin splices in a pressurized fuselage should be considered fatigue critical structure if they are not immune to fatigue cracking which could lead to a catastrophic failure. However, it may be reasonable to manage fatigue in these splices by only performing a special directed inspection on the most highly stressed area, which may only constitute a small percentage of the at-risk structure.

Some TC and STC holders have identified the PSE as being limited to this localized area. While this narrow usage of the term might be acceptable within the context of specific supplemental inspection documents (SID) or Airworthiness Limitations Sections (ALS), it could and has led to confusion and inappropriate actions when taken out of context. For this

[30] 71 FR 20583.

[31] § 25.571(a): ''An evaluation of the strength, detail design, and fabrication must show that catastrophic failure due to fatigue, * * * will be avoided throughout the operational life of the airplane. This evaluation must be conducted * * * for each part of the structure which could contribute to a catastrophic failure (such as wing, empennage, control surfaces, fuselage, engine mounts, and their related primary attachments) * * *.''

reason, we have chosen not to use the term ''principal structural element'' in this rule.

The purpose of requiring identification and listing of fatigue critical structure under this rule is to provide operators with a tool that will help in the evaluation of existing and future repairs and alterations. In this context, fatigue critical structure (FCS) is any structure that, if repaired or altered, could be susceptible to fatigue cracking and contribute to a catastrophic failure.

In the case of the longitudinal skin splices discussed above, we would expect that the FCS listed by the TC holder would include much more structure than just, for example, the localized area that is being inspected to gauge the fatigue state of all the splices. A hypothetical repair applied to even the lowest stress area of the splices could potentially make it more critical than the highest stressed area without a repair by increasing and redistributing structural loads. The result would be a repair needing its own special directed inspection to prevent potentially catastrophic failure. The only way to cover this contingency would be to perform a DTE.

As discussed above, we revised the proposed definition of FCS to clarify how the criteria of § 25.571 apply in the context of this rule. As we stated in the NPRM, [32] we intend for this rule to apply to future type certificate holders, as well as current holders. Because the list of FCS required by this rule may be more extensive than the structure identified as airworthiness limitations items currently developed by TC applicants, we added provisions to § 26.43 paragraphs (a) and (e) to make it clear that the list of FCS must be submitted as part of the type certification process. This requirement will help ensure that, new TC holders are properly addressing DT requirements in developing structural repair manuals (SRMs) and other service documents for use by operators. It will also assist operators in ensuring that a DTE is performed for all repairs and alterations to structure identified as FCS, as required by the AASFR, from the beginning of an airplane's operational life.

Regarding the concern that STC holders may not have experience in complying with § 25.571, current and earlier versions of AC 25.571–1C provide guidance on identifying PSEs that is also applicable to identification of FCS under this rule. Also, one reason this rule requires a compliance plan is to ensure that TC holders, STC holders, and the FAA have a common understanding of the rule's requirements, including acceptable compliance methods.

Regarding suggestions to use quantitative methods or methodologies used to comply with § 25.1309, our intent is to use the same method to identify FCS that is required by § 25.571. Paragraph (a) of § 25.571 states that an evaluation must be conducted for ''each part of structure that could contribute to a catastrophic failure.'' Therefore, the applicant must determine which parts of structure could contribute to a catastrophic failure when damaged as a result of fatigue cracking. Applying a probabilistic approach to determine if and when a part will contribute to a catastrophic failure has not been industry practice in complying with § 25.571. TC holders are required under § 25.571 to perform a damage tolerance evaluation on structure to determine when fatigue cracking may occur. At that point an inspection is performed to determine if cracking has occurred. A probabilistic approach would raise many implementation questions because fatigue cracking in metallic structure is a certainty and detection is imperative in order to prevent catastrophic failure of airplane structure. Probabilistic approaches would not be consistent with our objective of facilitating timely compliance.

D. Damage Tolerance Evaluation (DTE)

This rule requires TC holders and STC holders to review their repair and alteration data and determine if a DTE is needed. Unless previously accomplished, a DTE must be performed on all repairs and alterations that affect fatigue critical structure. A DTE is a process that leads to a determination of maintenance actions necessary to detect or preclude fatigue cracking that could contribute to a catastrophic failure. As applied to repairs and alterations, a DTE includes the evaluation of the repair or alteration and the fatigue critical baseline structure affected by the repair or alteration. Acceptable methods for performing DTEs are described in AC 25.571–1C.

The maintenance actions developed as a result of a DTE may include inspections, time limits for removal and replacement of repairs, modification of the repair, alteration to improve its fatigue characteristics, or in some cases modification of the affected FCS. The type of maintenance action that is appropriate depends upon the type of structure affected and the type of fatigue anticipated. For example, for fatigue cracks that grow at a predictable rate and that can be detected by inspections, a repetitive inspection program would be acceptable. For cracks in locations that cannot be inspected and for cracking that may grow too rapidly to be detected reliably, replacement or modification may be necessary.

Section 26.43(c) requires TC holders to perform a DTE of those repairs specified in their published repair data that affect fatigue critical structure. Similarly, §§ 26.45(c) and 26.47(c) require TC and STC holders to perform a DTE on their FAA-approved alteration data. In addition to the published repair and alteration data, this final rule requires that all future repair and alteration data receive a DTE to determine if inspections or other actions are necessary to ensure the airworthiness of the repair or alteration. This rule also requires TC holders to develop Repair Evaluation Guidelines (REGs) that will enable operators to survey their airplanes to identify repairs that affect fatigue critical baseline structure (FCBS) and to obtain any necessary damage tolerance inspections (DTI) for those repairs. If the REG directs the operator to obtain assistance from the TC holder for developing the DTI, the TC holder must make such assistance available.

As discussed below, based on comments to the NPRM, we revised the proposed requirements in §§ 25.1825(c) and 25.1827(c) (adopted as §§ 26.45(c)(1) and 26.47(c)(1), respectively)) to clarify that a DTE must be performed and the DTI developed for the alteration and the FCBS that is affected by the alteration.

Boeing and AAWG industry representatives asked that the regulatory text in proposed §§ 25.1825 and 25.1827 be revised to clarify that both alteration and baseline structure need to be assessed. They state that the description of the work proposed in these sections of the NPRM may be interpreted to mean that DTIs only need to be developed for the alteration that happens to affect FCBS. However, AAWG industry representatives do not believe this is the interpretation the FAA intends. AAWG industry representatives recommended that the language in both §§ 25.1825 and 25.1827 be changed to clearly say that the following three components must be addressed for alterations:

1. Identification of alterations that affect baseline fatigue critical structure.
2. Identification of the structural design details of the alteration that require DTE.
3. Identification of the affected design details of the baseline fatigue critical

[32] 71 FR at 20583.

structure that require a re-evaluation of their DTE.

The commenters are correct in that we did not intend for the development of DTIs to be limited to the alteration structure. When a DTE is performed for an alteration, the DTE must be applied to both the alteration and the FCBS that is affected by the alteration. Therefore, the DTI developed (as determined by the DTE) for an alteration would apply to the alteration structure and to the FCBS that is affected by the alteration. As stated above, we revised §§ 25.1825(c) and 25.1827(c) (adopted as §§ 26.45(c)(1) and 26.47(c)(1), respectively) to clarify that for the alteration and the FCBS that is affected by the alteration a DTE must be performed and the DTI developed.

The FAA does not believe that §§ 25.1825(c) and 25.1827(c) (adopted as §§ 26.45(c) and 26.47(c), respectively) need to be revised to clarify that alterations that affect FCBS need to be assessed, or to provide clarification on which structural design details of an alteration would require a DTE. Sections 25.1825(c)(1) (adopted as § 26.45(c)(1)) and 25.1827(c)(1) (adopted as § 26.47(c)(1)) already specify that a DTE must be performed for alterations that affect FCBS. In addition, the structure of the alteration that requires development of a DTI will be identified as part of a DTE performed on the alteration. The DTI may need to be developed for fatigue critical alteration structure or for other alteration structure that may affect the FCBS. We expect that this identification would be part of the DTE of the alteration.

Regarding the commenters' position that the proposed rule needs to be revised to clarify the design details of the affected FCBS that will need a re-evaluation of their DTE, the DTE of an alteration will include an evaluation of the FCS that is affected by the alteration. Therefore, in performing the evaluation of the affected FCBS, it must be determined if new or revised DTIs need to be developed for this structure. Such a determination is made as part of a DTE.

Mr. Thomas A. Knott, P.E., said the proposed rule ''is fine,'' except it does not address repairs and modifications done under part 43. He said there are many alterations and repairs that were not approved under an STC or developed by TC holders.

The FAA acknowledges that there are existing repairs and alterations that were developed and installed under 14 CFR part 43 without involvement by DAHs. This final rule takes into account these types of repairs. The guidelines the DAHs are required to develop will describe procedures for operators to follow in developing DTIs for repairs. For alterations affecting FCS for which no DAH is responsible, the AASFR requires operators either to develop the DT data themselves or contract for their development. Because there is no DAH for these alterations, they may be especially problematic if the installers failed to consider the fatigue characteristics of the alterations or their effects on the baseline structure. Both repairs and alterations will be identified and assessed as part of surveys conducted to support compliance with the AASFR.

E. Damage Tolerance Inspections (DTIs)

A DTI is defined in this final rule as inspections developed as a result of a DTE. The DTI includes the location of the airplane structure to be inspected, the inspection method, inspection procedures that include acceptance and rejection criteria, and the thresholds and intervals associated with those inspections. The DTI may also specify a time limit when the repair or alteration needs to be replaced. As discussed below, this definition reflects minor changes from the one in the proposed rule.

Boeing asked that the FAA revise the definition of DTI. It said the phrase ''and corrective maintenance actions'' could be confused with a requirement to provide repair instructions or other corrective measures for a condition found during an inspection. It said, historically, the only instructions provided are how to accomplish the inspection contained in the DTI and what action should be taken if the inspection could not be accomplished. Therefore, Boeing requested that the phrase ''and corrective maintenance actions'' be removed from the definition and replaced with the phrase, ''or a time limit when the repair needs to be replaced, or both.''

We agree and have revised the definition in the final rule as requested. The purpose of this rule is to support operators' implementation of damage tolerance inspection programs, as required by the AASFR. Operators already have access to information on corrective actions in the form of SRMs and other documents that may be necessary if the inspections reveal fatigue cracks. Therefore, it is not necessary to include the phrase ''and corrective maintenance actions'' in the definition of DTI.

Bombardier asked, with respect to inspections of repairs, that we clarify the phrase ''the location of the airplane structure to be inspected'' used in the DTI definition. Bombardier said it understands this phrase to mean that the DTI should clearly define which regions of the repair and underlying structure should be inspected and the NDT (non-destructive testing) method to be used in carrying out the inspection. It said the DTI should be clearly linked to the repair data, which will of itself define the repair location.

The FAA agrees that the DTI should clearly define the areas of the repair and underlying structure that should be inspected and the inspection method to be applied. The DTI will be applicable to specific repair data that will define the repair location. This approach is the same as that currently used by TC holders in developing SRMs to comply with § 25.571, Amendment 25–45 and later.

F. DT Data for Repairs

1. Published Repair Data

This final rule requires TC holders to review their published repair data and determine if DT data exist for the repairs or if the DT data need to be developed. This final rule defines published repair data as instructions for accomplishing repairs, which are published for general use in SRMs and service bulletins (or equivalent types of documents). As discussed below, we made minor revisions to the proposed definition.

Boeing requested that we revise the definition of ''published repair data'' to make it clearer. It recommended the following revised version of the proposed definition:

> Published repair data means applicable instructions for accomplishing repairs, which are published for general use in structural repair manuals and service bulletins (or equivalent types of documents).

The FAA agrees with the recommended revision to the definition of ''published repair data,'' and we have revised the definition, accordingly, with a minor change in wording.

Bombardier said a list of Structural Significant Items (primary structure) is provided in the SRMs for Bombardier Regional Aircraft. It urged the FAA to consider rulemaking to require the SRM to be an approved document. The SRM, Bombardier commented, can then incorporate all of the instructions for continuing airworthiness required by the NPRM and described previously in AC 25.1529. It said this approach has been used by Bombardier and Transport Canada for SRMs and component maintenance manuals (CMMs) applicable to aircraft and components certified as damage tolerant to § 25.571 (Amendment 25–45) and later.

As explained in the NPRM, SRMs, while not required documents, are FAA approved. Their purpose is to provide operators with readily available sources of approved repair data. Because the operational rules require that major repairs be accomplished according to FAA-approved data, an SRM that has not been FAA approved would not serve operators' needs. The SRM, if assessed for damage tolerance under § 25.571 (Amendment 25–45 or later Amendment), should include the necessary instructions to ensure a particular repair meets the criteria in AC 25.1529.

2. Effects of Multiple Repairs

Mr. Glenn Davis commented that DT data should address the effects of multiple repairs in close proximity on older aircraft, and future inspections should be based on a ''worst case scenario of the 'combination effect' of the multiple repairs.'' He said the FAA might consider requiring a time limit for individual or multiple repairs when the repaired structure would have to be replaced, unless the applicant or operator can confirm through a rational fatigue analysis, using an acceptable fatigue model, that the repaired structure does not need to be replaced. Mr. Davis said such a requirement could be applied to high stress areas in older aircraft such as pressure bulkheads, door apertures, attach fitting support structure for wings, and stabilizers.

The FAA agrees with Mr. Davis's comment that the DT data, specifically the DTE, should take into account the close proximity of repairs. AC 25.571–1C provides guidance on determining the effects of multiple repairs that are in close proximity. In addition, the repair assessment guideline (RAG) documents developed in support of § 121.370 (redesignated as § 121.1107)[33] address the effects of these types of repairs on the pressure vessel. The FAA believes that existing guidance in AC 25–571–1C, along with guidance developed in AC 120–93, as part of this final rule, adequately addresses this issue.

G. Repair Evaluation Guidelines (REGs)

This final rule requires TC holders to develop REGs that include processes operators could use to support compliance with §§ 121.1109 and 129.109 for repairs that affect FCBS. The guidelines must include—

- A process for conducting surveys of affected airplanes to identify and document all existing repairs that affect FCBS;
- A process that will enable operators to obtain DTIs for repairs that affect FCBS and for the FCBS affected by the repairs; and
- An implementation schedule that provides the timing for conducting airplane surveys and for developing and incorporating DTIs into the operator's maintenance program.

TC holders must submit the REGs to the FAA Oversight Office for review and approval and then make them available to affected operators.

As discussed below, we made several minor revisions to the proposed REG requirements.

In § 25.1823(f)(1)(iii) and (f)(4) (adopted as § 26.43(e)(1)(iii) and (e)(4)), we removed the term ''DT data'' from the phrase ''DT data implementation schedule.'' We made this change because the term ''DT data implementation schedule'' may be misunderstood to mean the actual timing of DT inspections (thresholds and inspection intervals). It was only intended to refer to the timing of major process related events (i.e., survey, development of DTIs, and incorporation of the DTI into the maintenance program).

We revised proposed § 25.1823(f)(1)(iii) (adopted as § 26.43(e)(1)(iii)) to make it clear that the implementation schedule must identify the times when actions must be taken as specific numbers of flight cycles, flight hours, or both. In developing its recommendation regarding implementation schedules, the AAWG proposed an approach that would have referenced the design service goal (DSG) for determining the timing of various actions and would have allowed for variability in DSGs for different airplanes of the same model, depending upon actual flight lengths and other factors.

We agree with the AAWG that it is appropriate to allow reference to DSGs in the implementation schedule to allow for industry resources to be allocated for compliance when they are needed. For example, the AAWG recommended that certain actions be taken when an airplane reaches ¾ DSG, before which fatigue cracking is less likely to have occurred. However, allowing variability in DSG for different airplanes of the same model would introduce a level of complexity and uncertainty to the requirements of the operational rules that would jeopardize their enforceability. Therefore, this rule requires that DSGs be stated as ''hard numbers.''

We revised § 25.1823(f)(3) (adopted as § 26.43(e)(3)) to remove the requirement that TC holders must make REGs available to STC holders. As adopted, this paragraph only requires the TC holder to make the REGs available to specified operators. We made this change because if STC holders have access to the TC holder's list of FCS, they will not need their REGs.

We also revised § 25.1823(f)(4) (adopted as § 26.43(e)(4)). The proposed paragraph reads as follows: ''If the guidelines direct the operator to obtain assistance from the holder of a type certificate, provide such assistance in accordance with * * *'' We revised this paragraph in the final rule to replace the words ''provide such assistance'' with the words ''make such assistance available.'' This change makes it clear that, as with other requirements for TC holders to support operators, this rule is not intended to require TC holders to provide this support without compensation.

Boeing said proposed § 25.1823(f)(3) specifies that the TC holder will make available the guideline documents to various entities. Boeing believes this proposed requirement is in error and the reference to proposed § 25.1827 should be removed from § 25.1823. Section 25.1827 is applicable to holders of and applicants for an STC. In reading § 25.1827 and draft AC 120–XX,[34] Boeing said there is no need for third parties to have access to the guidelines developed as part of § 25.1823. According to § 25.1827 and AC 120–XX, the only data required by an STC holder is the list of fatigue critical structure, as stipulated in § 25.1823(c)(2). In light of this, Boeing said, the reference to § 25.1827 should be deleted from proposed § 25.1823.

We agree that STC holders do not need the guidelines to comply with this final rule as long as they have access to the TC holder's list of FCS. We have revised the final rule as discussed above.

Boeing commented that proposed § 25.1823(f)(4) appears to be using incorrect terminology. It said the wording in § 25.1823(f)(4) could circumvent the current business practices and established relationships between the TC holder and the operator. Boeing requested that paragraph (f)(4) be changed as follows:

> If the guidelines direct the operator to obtain assistance from the holder of a type certificate, the holder of the type certificate will make available such assistance in accordance with the DT data implementation schedule.

It was not our intent to require TC holders to provide assistance to operators without compensation. As

[33] Repair Assessment for Pressurized Fuselages final rule (65 FR 24108; April 25, 2000).

[34] Issued as AC 120–93.

indicated above, we have revised the final rule as the commenter requested.

UPS expressed concern about the effectiveness of the proposed REGs. The proposed rule, it said, assumes that practical, cost effective REGs are achievable. However, the proposed procedure will be significantly more complex than the current Repair Assessment Guideline (RAG) documents, which only survey fuselage skin. UPS said the current repair assessment of pressurized fuselage skin results in removal and replacement of some repairs due to the inability to accurately determine the exact repair details. Fuselage skin repairs are relatively easy to assess because almost all damage is cut out and one side of the repair is accessible for detailed measurements. For other structure (e.g., stringers, ribs, spars, frames, shear clips, bathtub fitting) the ability to determine hidden repair details may not be possible without removing the repair. Consequently, the proposed survey method of documenting and establishing DTIs on existing repairs could result in a higher than necessary repair replacement frequency. To minimize the impact of the DTE of repairs, UPS believes it is vital that the FCS be properly identified.

In response to UPS's concerns about the effectiveness of the proposed REGs, the airplane repair survey process was patterned after existing RAG documents to minimize the impact of the DTE of repairs. AC 120–93 provides guidance for performing surveys to identify repairs that may affect FCS.

Regarding UPS's comment that certain structure may be difficult to inspect without having to remove the repair, operators should work with the TC holder in the Structural Task Group (STG) meetings to ensure an efficient process is developed for assessing repairs to minimize the unnecessary removal of repairs. The DTE will determine what actions are necessary to ensure the continued airworthiness of the affected FCBS. Performing DTIs on these airplanes should be no more difficult than performing them on airplanes for which repair data already have DTIs for compliance with the airplane's certification basis. We agree that it is vital that FCS be properly identified. As discussed previously, this final rule requires TC holders to apply the same analytical methods to create this list that they have applied for many years in complying with § 25.571.

H. DT Data for Alterations

This final rule requires TC holders to perform DTEs, and develop DTI, if necessary, for their alterations that affect FCBS. For existing alterations, TC holders must submit the DT data for FAA approval by June 30, 2009. For future alterations, the DT data are required before we approve the alteration data.

Similarly, STC holders must perform DTEs and develop DTIs for their alterations that affect FCBS. In addition to alterations, some STC holders must perform DTEs and develop DTIs, if necessary, for repairs developed by them that affect any FCS. For existing alterations, STC holders must submit the DT data for FAA approval by June 30, 2009. For future alterations, the DT data are required before we approve the alteration data.

The sections of the proposal that relate to alterations, (§§ 25.1825 and 25.1827 (adopted as §§ 25.45 and 25.47, respectively)) were revised as discussed below to make them clearer. As proposed, these sections may be misinterpreted to mean that the TC and STC holders need to perform a DTE of their alterations as installed on individual airplanes, addressing variations in the configurations of these airplanes. Our intent, however, is that they perform a DTE only of their alteration design data.

These sections may also be misinterpreted to mean that DTIs only need to be developed for the FCS of the alteration. In addition, as stated in the definition of damage tolerance evaluation in proposed § 25.1823(b), we intended that the DTE would also apply to the FCBS that is affected by the alteration and that the resulting DTI would also address the affected baseline structure. To clarify these requirements, the final rule specifies that TC and STC holders must, for each alteration affecting FCBS, identify and develop DTIs for both the FCBS that is affected by the alteration and the fatigue critical alteration structure. Other than some additional minor wording changes, there are no other changes to the sections of the final rule pertaining to alterations.

The ATA commented that the FAA should limit the number of DTEs necessary for alterations. Proposed § 25.1825(c) and § 25.1827(c) require TC holders to perform a DTE of each existing and future alteration and submit DT data for the existing alterations to the FAA. These provisions would apply to an impracticable number of alterations, according to the commenter. The ATA recommended, therefore, that the FAA clarify §§ 25.1825(c) and 25.1827(c) to stipulate that ''each alteration'' applies to each certificate or approval of an alteration rather than each installation.

The FAA agrees that it would be impracticable for TC or STC holders to perform a DTE for alterations as installed on individual airplanes, which may contain alterations and repairs that would affect the DTE of which the TC or STC holder is unaware. It was not the FAA's intent to require TC and STC holders to develop DT data for the actual installation of their developed design changes (alterations), but rather to require them to perform a DTE of the design changes affecting FCBS that are specified in their FAA-approved alteration data. This DTE must, however, address the range of airplane configurations on which the TC or STC holder showed the alteration is eligible for installation. We revised §§ 25.1825(c) and 25.1827(c) (adopted as §§ 26.45(c) and 26.47(c), respectively) to clarify that the DAHs are only responsible for performing DTE of their alteration data, and not of the alterations as actually installed.

I. Required Documentation

The ATA said the FAA should define the documents required of DAHs as specifically as possible, and the product should be delivered to the FAA for certification or approval in a form ready for direct installation or incorporation as required by the associated operating rule. The ATA said adherence to this recommendation should be facilitated by the participation of Structural Task Groups (STG) in the development of the DTI and REG. The ATA recommended that the FAA use consistent terminology in the final rule and in AC 120–XX,[35] so they clearly describe the documentation and data DAHs must make available to operators. It said draft AC 120–XX states that DAHs would provide operators with a model-specific ''compliance document.'' The NPRM, however, does not discuss the ''compliance document'' referenced in the draft AC. Similar to the ATA comment, Horizon Air asked that the rule define the specific type of required data that DAHs must make available to operators.

We agree with the ATA that this final rule should clearly identify the required data and documents. This final rule requires DAHs to develop and make available to operators lists of fatigue critical structure, damage tolerance inspections for their alterations and repair data (supported by DTE documentation submitted to the FAA), repair evaluation guidelines, and implementation schedules.

Based on the Aviation Rulemaking Advisory Committee's (ARAC)

[35] Issued as AC 120–93.

recommendations, the FAA developed AC 120–93 to facilitate DAH compliance with this rule and operator compliance with the AASFR. This AC describes a compliance document that would either contain or reference these required documents. Because the compliance dates for these documents differ, the DAH would not make the compliance document, as a whole, available until the last of these documents is approved.

As described in the AC, this compliance document would support an operator's development of an Operator's Implementation Plan (OIP). The OIP would provide the means for addressing the adverse effects of repairs and alterations. Once this OIP is approved by the operator's principal maintenance inspector (PMI), the operator would comply with the AASFR by incorporating the OIP into its maintenance program and implementing the OIP by performing surveys of its airplanes, obtaining necessary damage tolerance inspections and procedures, and performing those inspections and procedures, all in accordance with the approved implementation schedule contained in the OIP.

STGs, working under the auspices of the ARAC's Airworthiness Assurance Working Group (AAWG), may be convened to assist TC holders in developing airplane model-specific DT data. This rule and AC 120–93 reflect consistent terminology. The DT data to be developed and made available are described in §§ 26.43, 26.45, and 26.47 of this final rule, as well as in AC 120–93.

J. Proprietary Data

The ATA said the FAA should work with DAHs to establish a narrow and clear definition of proprietary data. DAHs have expressed concerns that the proposed requirements could lead to the disclosure of proprietary data (e.g., DT documentation). Conversely, operators are concerned that restrictive disclosure policies could result in REGs and DTIs that are too general to be used without costly and time-consuming consultation with the DAH. The ATA recommended that the FAA coordinate with DAHs to support a goal for documents that must be ''made available'' under the proposal that would allow operators to comply autonomously with the DT requirements without consulting with the DAH more than absolutely necessary. ATA said the FAA can support this recommendation further by providing guidelines to DAHs and STGs to ensure that claims of proprietary data are not overstated.

For many years, the FAA has required DAHs to disclose to affected persons information they might otherwise consider proprietary. For example, since 1981, DAHs have been required to provide Instructions for Continued Airworthiness, including DT data, which DAHs may have considered proprietary. However, because we have determined that this information is essential to maintaining the airplanes in an airworthy condition, we have required DAHs to make it available as a condition for obtaining and retaining their certificates. Regarding the usefulness of the documents developed by the DAHs, because we expect these documents will be developed by DAHs in collaboration with the affected operators, we anticipate that the operators will ensure they are useful for their intended purposes. FAA technical specialists will also be monitoring development of these documents for this purpose.

K. Compliance Plan

This final rule includes requirements for a compliance plan to ensure that affected TC and STC holders produce DT data in a timely manner that are acceptable in content and format. Integral to the compliance plan are procedures to allow the FAA to monitor progress toward compliance. The affected TC and STC holders must submit to the FAA Oversight Office on the compliance dates specified in the rule a compliance plan that addresses—

- The project schedule for meeting the compliance dates, including all major milestones;
- A proposed means of compliance with the requirements to develop and make available DT data; and
- A plan to submit to the FAA Oversight Office, not less than 60 days before the stated compliance dates, a draft of the required compliance items.

Based on comments submitted to other DAH airworthiness rules, the FAA has determined that we can remove some provisions of proposed § 25.1829 (adopted as § 26.49) without adversely affecting our ability to facilitate DAH compliance. Specifically, in § 25.1829(a)(3), we proposed a requirement for DAHs to identify the intended means of compliance that differ from those described in FAA advisory materials. While this is still a desirable element of any compliance plan, we have concluded that an explicit requirement is unnecessary. As with normal type certification planning, we expect that DAHs will identify these differences and fully discuss them with the FAA Oversight Office early in the compliance period to ensure that these differences will ultimately not jeopardize full and timely compliance.

Similarly, § 25.1829(c) contains provisions that would have authorized the FAA Oversight Office to identify deficiencies in a compliance plan or the DAH's implementation of the plan and to require specified corrective actions to remedy those deficiencies. While we anticipate that this process will still occur in the event of potential non-compliance, we have concluded that it is unnecessary to adopt explicit requirements to correct deficiencies.

Ultimately, DAHs are responsible for submitting compliant documents by the dates specified in §§ 26.43, 26.45, and 26.47 of this final rule. Section 26.49 retains the requirements to submit a compliance plan and to implement the approved plan. If the FAA Oversight Office determines that the DAH is at risk of not submitting compliant documents by the compliance dates because of deficiencies in either the compliance plan or the DAH's implementation of the plan, the FAA Oversight Office will document the deficiencies and request DAH corrective action. Failure to implement proper corrective action under these circumstances, while not constituting a separate violation, will be considered in determining appropriate enforcement action if the DAH ultimately fails to meet the requirements of this section.

We also added an exception for future TC applicants in § 26.49(a) to make it clear that these applicants are not required to submit a separate compliance plan for the applicable requirements of this final rule. These compliance issues should be addressed as part of the normal certification plan submitted for any type certificate project.

Section 25.1829(5) included a proposed requirement to include in the compliance plan a process for continually assessing service information related to structural fatigue damage. We have reconsidered this proposed requirement and concluded that existing regulations [36] that require both DAHs and operators to report structural defects should be adequate to enable us to determine whether the objectives of this final rule are being met. Therefore, we removed this provision from the final rule.

1. Process for Continuous Assessment of Service Information

Bombardier, in its comment on the compliance plan, referred to the proposed requirement that the compliance plan must address a process for continuous assessment of service information. Bombardier said feedback

[36] 14 CFR 21.3 and 121.703.

from operators on the effectiveness and findings resulting from DT-based inspections of baseline structure, as well as repairs and alterations, may not be adequate to enable them to meet this requirement.

As discussed above, we have removed this provision from this final rule since existing regulations will enable us to determine if the objectives of this final rule are being met.

2. Timing of FAA Approval

Airbus expressed concern that the FAA may not have sufficient resources to handle approval of compliance plans in a timely manner. Therefore, it recommends a thorough review of FAA resources needed for this activity before committing to the proposed compliance date.

FedEx said it understands that the compliance documents must be approved by the FAA Aircraft Certification Office (ACO) before they are made available to operators, but the proposed rule does not state when the documents would be made available to operators. FedEx said the rule should include a date by which the FAA would approve the DT data that TC and STC holders provide, as well as a date by which the approved data will be made available to operators.

The ATA said the FAA should commit to a schedule for approving the DT data from DAHs and implementation plans from operators. It requested that the FAA give an estimate of when industry can expect the FAA to approve the DT documents and implementation plans, taking into account the volume of the submissions.

We are not including time frames in the regulation for our review and approval of the compliance plans and compliance documents. Expectations for FAA personnel have been defined in FAA Order 8110.26, which directs the Aircraft Certification Service and Flight Standards Service in their roles and responsibilities for implementing these initiatives. The Order includes expected times for reviewing and approving DAH compliance plans, plans to correct deficiencies, and draft and final compliance data and documents. To facilitate implementation, we will also train affected personnel in their roles and responsibilities and provide familiarization with requirements of the regulations and associated guidance. However, our ability to approve documents, and the timing of our approvals, ultimately depends on the quality of the documents submitted by the DAHs and their responsiveness if we identify deficiencies.

L. Harmonization

The AAWG industry representatives, ATA, Boeing, Embraer, and Horizon Air commented that the FAA should harmonize the DT Data rule with EASA and other national airworthiness authorities. If the rule is not harmonized, the AAWG industry representatives expressed concern that the FAA's retention of authority to make all necessary compliance determinations for foreign DAHs will establish ''a substantial precedent that could create a significant challenge to all future certification programs.'' The AAWG industry representatives said the stated requirements advocate ''a procedure that could permit unilateral and potentially arbitrary certification activities at the whim of any regulatory authority.''

Boeing and the ATA said the lack of harmonization will cause unnecessary conflicts and complexities between the FAA's and foreign authorities' requirements. Boeing said while it is aware that EASA is pursuing a similar proposal, EASA may not adopt the same requirements as the FAA. Also, Boeing said, having to comply with different requirements in the same time frame would cause added complications and difficulties with meeting aggressive schedules, and it would result in unnecessary, additional work for the FAA.

Both Boeing and the ATA believe harmonization is a standard of excellence that has been achieved over many years of hard work and this rule should not interfere with that achievement.

We agree with the commenters that harmonization of this rule with other national authorities is an important objective. We fully expect to coordinate with EASA and other authorities on findings of compliance. EASA and Transport Canada Civil Aviation (TCCA) have participated in the AAWG's development of the AC that will support compliance with this final rule. As a follow-on to this activity, EASA has proposed the formation of a European Aging Aircraft Working Group and has requested participation by the FAA. The FAA plans to support this activity with representatives from both the Aircraft Certification Service and the Flight Standards Service. There is general agreement among the authorities on the need to address DT for repairs and alterations and on the approach adopted in this rule.

The AAWG industry representatives commented that there is the potential for creating substantial negative impact in the industry with respect to airplane certification sales and transfers between U.S. and foreign entities because the proposal has not been harmonized with EASA. According to the AAWG industry representatives, the economics of this impact has not been accounted for in the regulatory evaluation; therefore, the FAA should assure that the final rule is harmonized to the extent possible with EASA because of the potential economic issue for all parties. The AAWG industry representatives also said it appears that the long-term intention of EASA is to harmonize with the U.S. requirements by 2008 or 2009. And it said that the implementation time scales are different between the two authorities' approaches.

This rule will not have the negative effects suggested by the commenter. In fact, by requiring DAHs to develop and make available the data necessary to comply with the AASFR, this rule will facilitate compliance for all airplanes, which is a prerequisite for transferability. All authorities recognize that harmonization of this rule is important in that common requirements will allow expeditious transfer of airplanes across borders, and we are working towards that objective.

1. Foreign Authority Approval of Required Data

Airbus commented that the NPRM preamble indicates that the FAA cannot accept foreign authority approval for documents under Bilateral Agreements because these foreign authorities have not yet adopted a similar rule. It said the Joint Aviation Authorities (JAA) issued and applied Notice of Proposed Amendment (NPA 20–10) (the European Aviation Safety Agency (EASA) updated NPA 20–10 to NPA 05/2006), which addresses the same airworthiness issues and incorporates similar technical guidance. Moreover, evaluation of repairs, alterations, and modifications to DT requirements is state-of-the-art and is approved under the EASA regulatory system on a daily basis.

Airbus also said it will be at a disadvantage by having to deal unilaterally with the FAA without the support and involvement of EASA. Also, it said it would have to coordinate with the FAA's international branch along with several other non-U.S. TC holders. However, U.S. TC holders will have a dedicated FAA certification office to work with and may be able to use their authorized designees to perform compliance related activities.

According to Airbus, obtaining support from the FAA is especially important for proposed §§ 25.1823(d) and 25.1825(c) and (d) for alteration and

repair approvals. Therefore, Airbus requested that the FAA include EASA in the approval process, such that in the near future the FAA could accept the majority of the activities performed by EASA under the Bilateral Agreement. In addition, Airbus requested that the FAA give non-U.S. TC and STC holders the same level of priority and the same allocation of FAA resources as U.S. TC and STC holders. This, Airbus said, would help mitigate delays in reaction and approval time.

Horizon Air said the proposed rule states that data will be submitted to the FAA Oversight Office or its properly authorized designees. In defining ''authorized designees,'' reference is made only to Designated Engineering Representatives (DERs) specifically authorized by their supervising ACO.

Horizon Air also said that currently because of the Bilateral Agreement between Transport Canada and the FAA, it is able to incorporate DTE and DTI documentation for Bombardier and deHavilland airplanes directly into its maintenance program. Under the new rule, it appears it would be required to submit the developed repair data to the ACO before being able to implement it. Therefore, Horizon Air requested that Foreign Authorities, specifically Transport Canada, or their designees be included under Bilateral Agreements.

We recognize the important role other national authorities are likely to play in implementation of this rule. In addition to the on-going efforts to harmonize these requirements, we have been working closely with the other national authorities to define appropriate roles, responsibilities, and relationships among all affected authorities. As discussed in the NPRM, the compliance planning provisions are equally important for foreign TC holders, and we expect to have mutually agreeable arrangements with their authorities on how compliance planning will be overseen. We expect these other authorities to play a major role in reviewing their TC holders' compliance plans and other required documents, which will enable us to provide timely approvals for all affected TC and STC holders, assuming the submitted documents comply with the applicable requirements.

M. Enforcement

Bombardier and UPS expressed concerns about enforcement. Bombardier asked what mechanism the FAA would use to impose civil penalties on non-U.S. DAHs. UPS said the proposed rule does not state how the FAA would handle a DAH that does not complete the damage tolerance assessment tasks on time. It is also concerned whether the FAA can effectively enforce the intent of these types of provisions.

The compliance planning provisions of this rule are intended to facilitate timely compliance and avoid the need of enforcement for non-compliance. However, under 49 U.S.C. 46301, the FAA has authority to take civil penalty action without regard to nationality of the respondent. The FAA's general enforcement policies, which are set forth in 14 CFR part 13 and Order 2150.3, will apply to the DAH requirements. These general policies provide wide discretion for us to impose administrative action, civil penalties (up to $25,000 per violation per day) or action against a TC or STC holder's certificate (including suspension or revocation).

If a TC or STC holder is found to be non-compliant, we will consider the circumstances of non-compliance before determining an appropriate course of action. For example, deliberate violations will be treated more severely than inadvertent non-compliance. Any enforcement action the FAA may choose to take will be in consideration of the circumstances of the violation and defined on a case-by-case basis.

N. Industry and FAA Resources

UPS commented that DT analysis depends on complex methodology and data. Because of this, there are very few DERs in the industry that have FAA DTE approval authority. UPS suggested it is highly unlikely that this methodology and relevant data can be streamlined into an approach that is useful and effective. It suggested the FAA establish an initiative to authorize additional structures DERs with DTE approval authority.

ABX expressed concern that both industry and the FAA have a shortage of specialists in areas related to the rule. It said FAA ACOs don't have enough resources to provide the needed support to industry in a timely manner. It also said the present delegation requirements in the area of DT are unachievable for non-OEM DERs. Therefore, ABX said the FAA, with support of the industry, should take the following steps:

- Create different levels of delegation for DTE. If necessary, keep the requirements the same for full authority but allow DERs with less than required experience to obtain delegation to show compliance in specific areas, using previously FAA-approved methodology.
- Provide training to DERs and/or call for specific college courses that can substitute the experience to facilitate the delegation.
- Develop methodologies for DT analysis in the areas that are frequently needed by operators and STC holders.
- Postpone any rulemakings until the industry has the required tools to comply with the rule in the mandated time frame.

Recognizing the limited industry and FAA resources available to perform and approve DTEs, ARAC has developed guidance material in AC 120–93 that describes a means of compliance with this rule and the AASFR that allows the available resources to focus on the highest priority DTEs for repairs. This AC describes an implementation schedule with a phased-in approach under which existing repairs on the older and higher-utilization airplanes are assessed first (highest risk repairs), with newer airplanes being assessed when they approach their design service goal (DSG). This approach is similar to that established for certain RAGs developed for compliance with § 121.370[37] (redesignated as § 121.1107)). Therefore, we find the implementation schedule approach described in AC 120–93 to be a rational one. We believe this approach will help ensure that adequate industry and FAA resources will be available to support timely compliance with this final rule and with the AASFR.

The FAA agrees that there is a need for an increased number of designees having authorization for DT. To address this potential problem, the FAA is continuing to hold DER seminars to encourage participation by DERs in these programs. DERs can work with their FAA Oversight Office to develop a plan that would support expanding their authorized delegation to include DT. Due to the complexities associated with DT, particularly those related to performing DTEs on repairs and alterations, it is necessary to ensure DER candidates have adequate experience in performing DT and in analyzing repairs and alterations. The current process for obtaining DT-delegated functions requires DER applicants to have at least 1 year of experience in performing DTEs. This experience is necessary for the FAA to gain a level of confidence that the DER, once authorized to perform DT on repairs and alterations, will submit DT data that are appropriate and not subject to a need for extensive review by the FAA Oversight Office.

For compliance with the AASFR, it is of particular importance that the DERs have a working knowledge of what is required for showing compliance with § 25.571 for repairs and alterations. The FAA does not agree with the

[37] Special maintenance program requirements.

commenter's recommendation to allow DER candidates with less than the required experience to obtain a delegation for DT, or to substitute the requirement for experience with college courses to facilitate delegation. Experience is a key element in ensuring the success of the FAA's delegation program.

Regarding the recommendation that the FAA develop methodologies for DT analysis in the areas that are frequently needed by operators and STC holders, we believe the methodologies employed today, which have been used for several years throughout the aviation industry, are adequate. Damage-tolerance-based programs such as RAGs developed by TC holders to support operator compliance with § 121.370 (redesignated as § 121.1107), provide a streamlined approach operators can use for assessing repairs common to the airplane pressure boundary. Expansion of these guidelines to address additional structural areas (e.g., frequently repaired areas), or development of new RAGs, may support operator compliance with the AASFR. However, these types of DT-based programs are model specific and typically require TC holder involvement. Operators should coordinate with TC holders during STG meetings to determine the need for such programs and how they should be structured.

We disagree with the recommendation to postpone this rulemaking because we do not believe industry needs additional time to comply. As we have discussed, this final rule is needed to support operator compliance with the AASFR. That rule was adopted in February 2005. Delaying adoption of the DAH requirements in this rule would adversely affect operators' ability to meet the compliance time frame in the AASFR. In addition, methodologies for performing a DTE have been applied for several years and are readily available. Also, to reduce the resource burden, we describe in AC 120–93 an implementation schedule that may provide more time for operators to obtain DTEs for alterations for which there are no TC or STC holders. This implementation schedule may provide, in part, a means for addressing the potential adverse effects of alterations.

UPS said some STC holders may not have the resources (either financially, technically, or both) to comply with the proposal. Further, it said, the proposal does not address the situation where an STC holder has gone out of business or has surrendered its STC to the FAA.

The FAA recognizes that there may be some occasions where the DAH is unwilling or unable to comply with the regulations. There may also be cases where the DAH no longer exists. As stated in the policy statement, Safety—A Shared Responsibility—New Direction for Addressing Airworthiness Issues for Transport Category Airplanes, under these circumstances, the operator is still obligated to comply with the operational rules. However, the FAA recognizes that such occasions may significantly complicate the operator's effort to show compliance with the operational rules. The FAA recommends the affected operators contact their DAHs early in the compliance process to ensure their intent to comply. These operators are also encouraged to collaborate with other operators who may also be impacted by lack of support on a means for compliance.

O. Compliance Dates

As noted before, today's final rule supports the AASFR, which requires operators to incorporate a means to address the adverse effects of repairs and alterations into their maintenance program by December 20, 2010. This DAH DT Data final rule includes compliance dates that require DAHs to make the required DT documents available to operators in enough time for them to comply with their approved means for addressing repairs and alterations. The approved means will include implementation schedules that provide timing for when airplane repair surveys are to be performed and when DTI or other maintenance actions for repairs and alterations need to be incorporated into the maintenance program. Certain of the compliance dates in the DAH DT Data final rule have changed from those in the proposed rule.

Specifically, in proposed § 25.1823(g)(1), TC holders would have 90 days after the effective date of the rule to submit their lists of fatigue critical baseline structure. In proposed § 25.1825(e)(1), they would have 90 days to submit their lists of fatigue critical alteration structure. In proposed § 25.1827(e)(1), STC holders would have 270 days to submit their lists of fatigue critical alteration structure.

In the final rule (§ 26.43(f)(1)), TC holders have 180 days from the effective date to submit their lists of fatigue critical baseline structure. TC and STC holders (§§ 26.45(e)(1) and 26.47(e)(1), respectively) have 360 days from the effective date of the rule to submit their lists of fatigue critical alteration structure.

The AAWG industry representatives, Boeing, FedEx, and Embraer asked for an extension of the compliance date in the AASFR and a commensurate extension of the DAH DT Data rule's compliance date. While several of the commenters acknowledged the FAA's prior 3-year extension (from 2007 to 2010) to the compliance time for the AASFR, they said if the FAA had published the DAH DT Data NPRM at the time of that extension, industry would have had more time to comply with the DAH DT Data final rule.

The AAWG industry representatives asked us to extend the AASFR compliance date of December 20, 2010 to December 20, 2013. FedEx asked the FAA to give operators a minimum of 12 months after receiving the FAA-approved documents to develop their implementation plan to send to their FAA Flight Standards District Office. Boeing asked us to extend the AASFR compliance date to August 18, 2013. It said the FAA should impose incremental compliance times from the effective date of final rules, rather than impose a fixed date. For the DAH DT Data final rule, Boeing believes the FAA should allow DAHs 4 years from the effective date of the rule to submit their documents to the FAA because of the addition of the DAH requirements and related compliance plan in this final rule.

Except as discussed previously regarding lists of fatigue critical structure (FCS), we do not believe an extension of the compliance dates in either rule is appropriate. As several of the commenters acknowledged, we previously extended the compliance date for the AASFR by 3 years to allow ARAC time to develop guidance material operators could use to support compliance with DT requirements related to repairs and alterations.

Based on requests from industry, in May 2004, we tasked [38] ARAC to develop guidance to support operator compliance with the AASFR. Included in the tasking notice was a task for ARAC to do the following:

> Oversee the Structural Task Group (STG) activities that will be coordinated for each applicable airplane model by the respective type certificate holders and parts 121 and 129 certificate holders. These STG activities will involve the development of model specific approaches for compliance with §§ 121.370a and 129.16 [redesignated as §§ 121.1109 and 121.109, respectively]* * *

In addition, the tasking states that the data developed by the TC holders via STG meetings, using the guidance material developed by ARAC, should be completed by December 18, 2009. ARAC accepted this tasking, which it assigned

[38] 69 FR 26641; May 13, 2004.

to the AAWG, and agreed to complete it by the specified date of December 18, 2009.

In the February 2005 AASFR, we extended the December 5, 2007 compliance date adopted in the Aging Airplane Safety Interim final rule [39] to December 20, 2010. This extension was meant to give ARAC time to complete the tasking and allow operators a full year to implement the resulting program changes. The AAWG developed a schedule for completion of the tasking by the agreed-upon date. The compliance dates specified in this DAH DT Data final rule are fully consistent with these commitments, and none of the commenters have identified reasons why we should not expect these commitments to be fulfilled.

Regarding Boeing's comment that this rule imposes additional requirements for which they need more time, assuming ARAC and the STGs fulfill their commitments, we anticipate that the products of the tasking will enable Boeing and other participating TC holders to meet the requirements of this rule with little additional effort. Specifically, regarding compliance planning, this type of planning is normal business practice, regardless of the requirements of this rule, as evidenced by the AAWG's schedule development discussed earlier.

The ATA, Boeing, UPS, FedEx, and AAWG industry representatives asked that DAHs be given 180 days from the effective date of the final rule to submit their lists of fatigue critical baseline structure to the FAA. The ATA and UPS asked that the FAA allow 360 days from the effective date of the final rule for STC holders to submit their lists of fatigue critical alteration structure. Airbus requested an extension of 1 year from the effective date of the final rule to submit its lists of fatigue critical baseline structure. The commenters believe it is important to allow DAHs enough time to develop the lists to ensure they are accurate.

Boeing and AAWG industry representatives indicated that the FAA should allow additional time to develop the lists because of their importance to industry and to other rules like the proposed Widespread Fatigue Damage (WFD) rule. Boeing said more time would enable it to consult with the STGs on the format and content of the lists. It also said more time is needed because of the large numbers of airplanes and alterations involved and the need for internal coordination to ensure consistency. It estimates that for its airplane models, it would have to produce more than 40 lists.

The ATA, FedEx, and UPS said if DAHs do not have sufficient time to develop accurate lists, they may produce overly conservative lists that include all primary structure. The ATA and FedEx add that such lists would be of little value to operators and would add costs and complexities to operator compliance with the AASFR. Also, the ATA said DAHs may opt to recommend replacement of structural elements rather than inspections and repairs if they do not have enough time to compile the lists. Airbus commented that it does not have the resources to complete the necessary assessments and compile the lists in the proposed time frames. Airbus said the consequence of not having enough time to develop accurate lists could be either incomplete lists or extremely long lists.

The FAA believes additional time to establish the lists of fatigue critical baseline and alteration structures is appropriate, and has revised the rule as discussed above. The revised time frames, which give TC holders 180 days to submit their lists of FCBS and TC and STC holders 360 days to submit their lists of fatigue critical alteration structure, should allow sufficient time to develop the lists. This is particularly true since the TC holders have been required to identify fatigue critical structure to comply with the damage tolerance requirements of § 25.571 since 1978. For pre-amendment 25–45 airplanes, the TC holder analysis that led to the development of the SID documents provide a useful starting point for developing these lists. As discussed previously, these activities should already be well underway.

P. Costs and Benefits

The AAWG industry representatives and Boeing commented on our statement in the NPRM that the costs of the proposed rule were accounted for in the AASFR. The AAWG industry representatives believe that the economics on which the proposed rule is based are questionable and their basis cannot be determined. Boeing said the FAA assumed that much of the work required for compliance with the proposed rule was already completed by the TC holders on other programs, such as the SID and RAG initiatives. The commenters added that the costs ascribed to the TC holder in the proposed rule, in fact, did not exist at the time the original rule was published for comment, nor do they exist today.

The AAWG industry representatives and Boeing requested that the FAA revise the basis of the economic evaluation of the proposed rule, and include accurate estimates of the cost of the development of compliance data by the TC holders, based on the means of compliance suggested in AC 120–93.

The ATA said the FAA should disclose DAH estimates for the cost of damage tolerance data and documents. The ATA indicated that it does not concur with the FAA's assertion that the proposed rule has minimal to no costs. The ATA recommended that the FAA include DAH estimates for the cost of these documents in its disposition of comments to the proposal.

UPS said the costs of the proposed rule changes are understated. Although the regulatory flexibility analysis in the rulemaking states that this rule would relieve small-entity part 121 operators of what could be a significant cost, there is nothing in this proposal that prevents DAHs from passing all their costs on to the operators. Although this compensation could be reasonable, it will also likely be significant. UPS suggested that an accurate cost-benefit analysis be accomplished and evaluated prior to adopting this rulemaking.

The requirements to develop damage tolerance (DT) based data for repairs and alterations were originally established in the Aging Airplane Safety Interim final rule (AASIFR). These responsibilities were initially placed on the operators of part 121 and U.S.-registered part 129 transport category airplanes. The costs and benefits were computed in the regulatory evaluation for that rulemaking. The regulatory evaluation for the AASIFR, as well as the regulatory evaluation for the AASFR, which clarified these requirements, recognized that to comply with the rule's requirements, operators would have to develop and implement DT-based inspections and procedures for the affected airplane structure. This DAH DT Data final rule is a counterpart to the AASFR; it transfers the responsibility of developing DT-based data from operators to design approval holders (DAHs). Therefore, it has minimal to no societal costs.

We anticipate that by the compliance date for the AASFR, DT inspection programs for baseline structure, required by this DAH DT Data final rule, will already be mandated by AD or certification or operational regulations for all airplanes affected by this final rule. A significant number of operators subject to the AASFR are small entities. If each of the small-entity operators individually took the responsibility for developing DT-based data, the cost for the data would be significant. By transferring the responsibility from part 121 operators to DAHs, this rule will

[39] 67 FR 72726; December 6, 2002.

relieve those operators of what could be a significant cost.

While UPS is correct that operators may have to compensate TC holders for the data they make available, we expect these costs to be substantially less than if the operators had been required to individually develop their own data.

The DAHs, with their greater expertise and access to design data, are in the best position to identify fatigue critical structure and methods and frequency of inspections operators need to comply with the AASFR. DAHs can develop these data with greater efficiency than individual operators and these costs would be amortized over a larger fleet. With STG participation, we expect that the resulting compliance documents will minimize costs for operators and facilitate their compliance with the AASFR. This final rule will ensure that the required data are developed in a timely manner to minimize the possibility for disruption of airline operations when the AASFR compliance deadline is reached. AC 120–93 is largely a product of ARAC and reflects industry's view of the most cost effective means for developing the data operators must implement under the AASFR.

Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995, (5 CFR 1320.8(b)(2)(vi)), an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Information collection requirements in the AASFR previously have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) and have been assigned OMB Control Numbers: 2120–0020 and 2120–0008. Part 129 record requirements can be found in International Civil Aviation Organization Annexes.

The FAA reviewed data associated with compliance to the AASFR and data associated with this rule. We have determined that this rule is a transfer of responsibility only, and there is no additional paperwork burden on the public. The paperwork burden for compliance with the AASFR will be reduced as a result of this rule due to a reduction in the numbers of repairs and alterations that will need an individual damage tolerance assessment. This is because this rule will require design approval holders to develop a streamlined approach for assessing repairs.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has determined that there are no ICAO Standards and Recommended Practices that correspond to these regulations.

IV. Final Regulatory Evaluation, Regulatory Flexibility Determination, International Trade Impact Assessment, and Unfunded Mandates Assessment

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Pub. L. 96–354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Pub. L. 96–39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, the Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble summarizes the FAA's analysis of the economic impacts of this final rule.

Department of Transportation Order DOT 2100.5 prescribes policies and procedures for simplification, analysis, and review of regulations. If the expected cost impact is so minimal that a proposed or final rule does not warrant a full evaluation, this order permits that a statement to that effect and the basis for it be included in the preamble if a full regulatory evaluation of the cost and benefits is not prepared. Such a determination has been made for this final rule. The reasoning for this determination follows.

We begin with a discussion of the AASFR. Then we discuss the existing certification and operational rules that already require operators to develop and implement the DT inspections and procedures this final rule will require.

This rule transfers the responsibility of developing AASFR DT data and documents from operators to DAHs. A transfer of responsibility from one entity to another does not increase societal costs; therefore, this rule has minimal to no costs. Additionally, the DAH requirements do not preclude DAHs from recouping their costs by seeking reasonable compensation from the operators for the required DT data and documents. The recently published AASFR [40] requires airline operators of certain large transport category airplanes to implement DT-based inspections and procedures for airplane structure susceptible to fatigue cracking that could contribute to catastrophic failure. Damage tolerance data are essential for operators to implement and conduct DT-based inspections and procedures.

This final rule is a counterpart to the AASFR to ensure that operators have the necessary data and documents to support timely compliance with the requirements of §§ 121.1109 and 129.109. Timely operator compliance improves the safety of the fleet.

This final rule will require DAHs to develop DT inspections and procedures for repairs and alterations. Existing operational rules already require DT inspections and procedures for repairs and alterations to baseline structure. TC Holders of airplanes certified to Amendment 25–45 (or later), which are affected by this proposal, are required by § 25.571 to perform a damage tolerance evaluation and establish, as necessary, damage tolerance inspections or other procedures. On pre-Amendment 25–45 airplanes, DT inspection and procedures for the baseline structure are required by airworthiness directive (AD). Damage tolerance inspections for repairs and alterations to affected Boeing 727 and 737–100/200 airplanes are also required by AD. Damage tolerance inspections for repairs to the pressurized fuselage [41] for certain pre-Amendment 25–45 airplanes [42] are required by § 121.370 (redesignated as § 121.1107). By December 2010, damage tolerance inspections for the baseline structure and repairs and alterations will be required by §§ 121.1109 and 129.109 for airplanes certificated after January 1, 1958 that have a passenger seating

[40] 70 FR 5518, February 2, 2005.

[41] Fuselage, door skins, and bulkhead webs.

[42] A–300 (excluding the –600 model), 707, 720, 727, 737–300/400/500/600/700/800, 747 BAC 1–11, F–28, L–1011, DC–8, DC–9, MD–80, and DC–10.

capacity of 30 or more or a maximum payload capacity of 7500 pounds or more. Despite these requirements, in many cases, DT data and documents have not yet been developed for many repairs and alterations made to the affected airplanes.

The following table summarizes the regulatory requirements for DT inspection programs. The shaded areas in the table represent regulatory gaps filled by the AASFR (§ 121.1109) requirements to develop DT inspections and procedures for fatigue critical airplane structural areas.

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	Airplane Damage Tolerance Requirements			
Amendment Level Airplane Models	BASELINE structure	REPAIRS to fuselage & door skin, bulkhead webs	REPAIRS to all other areas	ALTERATIONS/ MODIFICATIONS
25-45 or later 737-600/700/800/900, 757, 767, 777, MD11, ATR42/72, F100, A320, A321, A318, A319, A300-600, A310, A340, A330, A380, EMB 135/145/170/190, SAAB 340/ 2000, CL-600/700/900, DHC-8, CASA C-295, CN-235, DO-328, DO 328JET, BAE146, AVRO 146, BAE Jetstream 4100	Certification Basis § 25.571 - Amdt 25-45 and later amendments require damage tolerance (DT) inspections	Certification Basis § 25.571 - Amdt 25-45 and later amendments require damage tolerance (DT) inspections	Certification Basis § 25.571 - Amdt 25-45 and later amendments require damage tolerance (DT) inspections	Certification Basis § 25.571 - Amdt 25-45 and later amendments require damage tolerance (DT) inspections
Pre 25-45 727, 737-100/200	SID[43] ADs	§ 121.1107 (Repair Assessment Rule) and SID ADs	SID ADs	SID ADs
Pre 25-45 737-300/400/500	A SID has been developed AD is pending	§ 121.1107 (Repair Assessment Rule) and SID ADs	§ 121.1109	§ 121.1109
Pre 25-45 A300, 747, F-28, L-1011-1/-2, DC-8, DC-9, MD-80, DC-10	SID ADs	§ 121.1107 (Repair Assessment Rule) and SID ADs	§ 121.1109	§ 121.1109
Pre 25-45 L-188, F27	SID ADs	§ 121.1109	§ 121.1109	§ 121.1109
Pre 25-45 L-382 L1011-3	DT data have been developed	§ 121.1109	§ 121.1109	§ 121.1109

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In summation, this final rule will transfer the responsibility from the existing requirements for developing DT based inspections and procedures from part 121 operators to DAHs. The DAHs, with their greater expertise and access to design data, are in the best position to identify fatigue critical structure and methods and frequency of inspections operators need to comply with the

[43] Supplemental Inspection Document.

AASFR. DAHs can develop these data with greater efficiency than individual operators and these costs will be amortized over a larger fleet. This final rule will ensure that the required data are developed in a timely manner to minimize the possibility for disruption of airline operations when the AASFR compliance deadline is reached.

The FAA has, therefore, determined this rulemaking action is not a ''significant regulatory action'' as defined in section 3(f) of Executive Order 12866, and is not ''significant'' as defined in DOT's Regulatory Policies and Procedures. In addition, the FAA has determined that this final rulemaking action: (1) Will not have a significant economic impact on a substantial number of small entities; (2) will not affect international trade; and (3) will not impose an unfunded mandate on State, local, or tribal governments, or on the private sector.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (Pub. L. 96–354) (RFA) establishes ''as a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration.'' The RFA covers a wide range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a rule will have a significant economic impact on a substantial number of small entities. If the agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA.

However, if an agency determines that a rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

We did not receive comments from U.S. small entities in the responses to the proposed rule.

The FAA recently adopted the Aging Airplane Safety Final Rule (AASFR),[44] which, among other things, requires airline operators of certain large transport category airplanes [45] to implement damage tolerance (DT) based inspections and procedures for airplane structure.

This final rule is a counterpart to the AASFR. By the effective date of this rule, DT inspection programs will already be required by AD, certification or operational regulations for all part 121 airplanes affected by this proposal. The final rule will transfer the requirement to develop AASFR DT based data for inspections and procedures from part 121 operators to design approval holders (DAH). A significant number of part 121 operators are small entities. By transferring the responsibility from part 121 operators to DAH, this final rule may relieve small-entity part 121 operators of what could be a significant cost.

DAHs include manufacturers of part 25 airplanes and supplemental type certificate (STC) holders for repairs and alterations made to these airplanes.

The current United States part 25 airplane manufacturers include: Boeing, Cessna Aircraft, Gulfstream Aerospace, Learjet (owned by Bombardier), Lockheed Martin, and Raytheon Aircraft. These manufacturers will incur Type Certificate (TC) and Amended TC costs. Because all U.S. transport-aircraft category manufacturers have more than 1,500 employees, none are considered small entities.

STC holders include manufacturers and operators of part 25 airplanes, some of which are small-entities. Since the DAH requirements do not preclude them from seeking reasonable compensation from the operators for the proposal's required DT data and documents, small-entities STC holders, with less than 1,500 employees, should be able to recoup their costs.

Therefore, as the Acting FAA Administrator, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

International Trade Impact Assessment

The Trade Agreements Act of 1979 (Pub. L. 96–39) prohibits Federal agencies from establishing any standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA has assessed the potential effect of this final rule and determined that it will impose the same costs on domestic and international entities and thus has a neutral trade impact.

Unfunded Mandate Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of $100 million or more (adjusted annually for inflation with the base year 1995) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a ''significant regulatory action.'' The FAA currently uses an inflation-adjusted value of $128.1 million in lieu of $100 million.

This final rule does not contain such a mandate. The requirements of Title II do not apply.

Executive Order 13132, Federalism

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

Environmental Analysis

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

Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). We have determined that it is not a ''significant energy action'' under Executive Order 12866, and it is not

[44] 70 FR 5518, February 2, 2005.

[45] The rule applies to turbine powered airplane models with a maximum type certificated passenger capacity of 30 or more, or a maximum payload capacity of 7,500 pounds or more.

likely to have a significant adverse effect on the supply, distribution, or use of energy.

Availability of Rulemaking Documents

You can get an electronic copy of rulemaking documents using the Internet by—

1. Searching the Federal eRulemaking Portal (*http://www.regulations.gov*);
2. Visiting the FAA's Regulations and Policies Web page at *http://www.faa.gov/regulations_policies/;* or
3. Accessing the Government Printing Office's Web page at *http://www.gpoaccess.gov/fr/index.html.*

You can also get a copy by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267–9680. Make sure to identify the amendment number or docket number of this rulemaking.

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) or you may visit *http://DocketsInfo.dot.gov.*

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. If you are a small entity and you have a question regarding this document, you may contact your local FAA official, or the person listed under the **FOR FURTHER INFORMATION CONTACT** heading at the beginning of the preamble. You can find out more about SBREFA on the Internet at *http://www.faa.gov/regulations_policies/rulemaking/sbre_act/.*

List of Subjects

14 CFR Part 26

Aircraft, Aviation safety, Continued airworthiness.

14 CFR Parts 121, 129

Air carriers, Aircraft, Aviation safety, Reporting and recordkeeping requirements, Continued airworthiness.

V. The Amendments

■ In consideration of the foregoing, the Federal Aviation Administration amends Chapter I of Title 14, Code of Federal Regulations parts 26, 121, and 129 as follows:

PART 26—CONTINUED AIRWORTHINESS AND SAFETY IMPROVEMENTS FOR TRANSPORT CATEGORY AIRPLANES

■ 1. The authority citation for part 26 continues to read as follows:

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

■ 2. Revise § 26.5 to read as follows:

§ 26.5 Applicability table.

Table 1 of this section provides an overview of the applicability of this part. It provides guidance in identifying what sections apply to various types of entities. The specific applicability of each subpart and section is specified in the regulatory text.

TABLE 1.—APPLICABILITY OF PART 26 RULES

	Applicable sections	
	Subpart B (EAPAS/FTS)	Subpart E damage tolerance data
Effective Date of Rule	December 10, 2007 ..	January 11, 2008
Existing [1] TC Holders	26.11	26.43, 26.45, 26.49
Pending [1] TC Applicants	26.11	26.43, 26.45
Existing [1] STC Holders	N/A	26.47, 26.49
Pending [1] STC/ATC Applicants	26.11	26.45, 26.47, 26.49
Future [2] STC/ATC Applicants	26.11	26.45, 26.47, 26.49
Manufacturers	N/A	N/A
Persons seeking design approval of repairs	N/A	N/A

[1] As of the effective date of the identified rule.
[2] Application made after the effective date of the identified rule.

■ 3. Amend part 26 to add subparts C, D, and E to read as follows:

Subpart C—[Reserved]

Subpart D—[Reserved]

Subpart E—Aging Airplane Safety—Damage Tolerance Data for Repairs and Alterations

Sec.
§ 26.41 Definitions.
§ 26.43 Holders of and applicants for type certificates—Repairs.
§ 26.45 Holders of type certificates—Alterations and repairs to alterations.
§ 26.47 Holders of and applicants for a supplemental type certificate—Alterations and repairs to alterations.
§ 26.49 Compliance plan.

Subpart C—[Reserved]

Subpart D—[Reserved]

Subpart E—Aging Airplane Safety—Damage Tolerance Data for Repairs and Alterations

§ 26.41 Definitions.

Affects (or Affected) means structure has been physically repaired, altered, or modified, or the structural loads acting on the structure have been increased or redistributed.

Baseline structure means structure that is designed under the original type certificate or amended type certificate for that airplane model.

Damage Tolerance Evaluation (DTE) means a process that leads to a determination of maintenance actions necessary to detect or preclude fatigue cracking that could contribute to a catastrophic failure. As applied to repairs and alterations, a DTE includes the evaluation both of the repair or alteration and of the fatigue critical structure affected by the repair or alteration.

Damage Tolerance Inspection (DTI) means the inspection developed as a result of a DTE. A DTI includes the areas to be inspected, the inspection method, the inspection procedures, including acceptance and rejection criteria, the threshold, and any repeat

intervals associated with those inspections. The DTI may specify a time limit when a repair or alteration needs to be replaced or modified. If the DTE concludes that DT-based supplemental structural inspections are not necessary, the DTI contains a statement to that effect.

DT data mean DTE documentation and the DTI.

DTE documentation means data that identify the evaluated fatigue critical structure, the basic assumptions applied in a DTE, and the results of a DTE.

Fatigue critical structure means airplane structure that is susceptible to fatigue cracking that could contribute to a catastrophic failure, as determined in accordance with § 25.571 of this chapter. Fatigue critical structure includes structure, which, if repaired or altered, could be susceptible to fatigue cracking and contribute to a catastrophic failure. Such structure may be part of the baseline structure or part of an alteration.

Implementation schedule consists of documentation that establishes the timing for accomplishing the necessary actions for developing DT data for repairs and alterations, and for incorporating those data into an operator's continuing airworthiness maintenance program. The documentation must identify times when actions must be taken as specific numbers of airplane flight hours, flight cycles, or both.

Published repair data mean instructions for accomplishing repairs, which are published for general use in structural repair manuals and service bulletins (or equivalent types of documents).

§ 26.43 Holders of and applicants for type certificates—Repairs.

(a) *Applicability.* Except as specified in paragraph (g) of this section, this section applies to transport category, turbine powered airplane models with a type certificate issued after January 1, 1958, that as a result of original type certification or later increase in capacity have—

(1) A maximum type certificated passenger seating capacity of 30 or more; or

(2) A maximum payload capacity of 7,500 pounds or more.

(b) *List of fatigue critical baseline structure.* For airplanes specified in paragraph (a) of this section, the holder of or applicant for a type certificate must—

(1) Identify fatigue critical baseline structure for all airplane model variations and derivatives approved under the type certificate; and

(2) Develop and submit to the FAA Oversight Office for review and approval, a list of the structure identified under paragraph (b)(1) of this section and, upon approval, make the list available to persons required to comply with § 26.47 and §§ 121.1109 and 129.109 of this chapter.

(c) *Existing and future published repair data.* For repair data published by a holder of a type certificate that is current as of January 11, 2008 and for all later published repair data, the holder of a type certificate must—

(1) Review the repair data and identify each repair specified in the data that affects fatigue critical baseline structure identified under paragraph (b)(1) of this section;

(2) Perform a DTE and develop the DTI for each repair identified under paragraph (c)(1) of this section, unless previously accomplished;

(3) Submit the DT data to the FAA Oversight Office or its properly authorized designees for review and approval; and

(4) Upon approval, make the DTI available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(d) *Future repair data not published.* For repair data developed by a holder of a type certificate that are approved after January 11, 2008 and are not published, the type certificate holder must accomplish the following for repairs specified in the repair data that affect fatigue critical baseline structure:

(1) Perform a DTE and develop the DTI.

(2) Submit the DT data required in paragraph (d)(1) of this section for review and approval by the FAA Oversight Office or its properly authorized designees.

(3) Upon approval, make the approved DTI available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(e) *Repair Evaluation Guidelines.* The holder of a type certificate for each airplane model subject to this section must—

(1) Develop repair evaluation guidelines for operators' use that include—

(i) A process for conducting surveys of affected airplanes that will enable identification and documentation of all existing repairs that affect fatigue critical baseline structure identified under paragraph (b)(1) of this section and § 26.45(b)(2);

(ii) A process that will enable operators to obtain the DTI for repairs identified under paragraph (e)(1)(i) of this section; and

(iii) An implementation schedule for repairs covered by the repair evaluation guidelines. The implementation schedule must identify times when actions must be taken as specific numbers of airplane flight hours, flight cycles, or both.

(2) Submit the repair evaluation guidelines to the FAA Oversight Office for review and approval.

(3) Upon approval, make the guidelines available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(4) If the guidelines direct the operator to obtain assistance from the holder of a type certificate, make such assistance available in accordance with the implementation schedule.

(f) *Compliance times.* Holders of type certificates must submit the following to the FAA Oversight Office or its properly authorized designees for review and approval by the specified compliance time:

(1) The identified list of fatigue critical baseline structure required by paragraph (b)(2) of this section must be submitted no later than 180 days after January 11, 2008 or before issuance of the type certificate, whichever occurs later.

(2) For published repair data that are current as of January 11, 2008, the DT data required by paragraph (c)(3) of this section must be submitted by June 30, 2009.

(3) For repair data published after January 11, 2008, the DT data required by paragraph (c)(3) of this section must be submitted before FAA approval of the repair data.

(4) For unpublished repair data developed after January 11, 2008, the DT data required by paragraph (d)(1) of this section must be submitted within 12 months of the airplane's return to service or in accordance with a schedule approved by the FAA Oversight Office.

(5) The repair evaluation guidelines required by paragraph (e)(1) of this section must be submitted by December 30, 2009.

(g) *Exceptions.* The requirements of this section do not apply to the following transport category airplane models:

(1) Convair CV–240, 340, 440, if modified to include turbine engines.

(2) Vickers Armstrong Viscount, TCDS No. A–814.

(3) Douglas DC–3, if modified to include turbine engines, TCDS No. A–618.

(4) Bombardier CL–44, TCDS No. 1A20.

(5) Mitsubishi YS–11, TCDS No. A1PC.

(6) British Aerospace BAC 1–11, TCDS No. A5EU.

(7) Concorde, TCDS No. A45EU.
(8) deHavilland D.H. 106 Comet 4C, TCDS No. 7A10.
(9) deHavilland DHC–7, TCDS No. A20EA.
(10) VFW-Vereinigte Flugtechnische Werk VFW–614, TCDS No. A39EU.
(11) Illyushin Aviation IL 96T, TCDS No. A54NM.
(12) Bristol Aircraft Britannia 305, TCDS No. 7A2.
(13) Handley Page Herald Type 300, TCDS No. A21N.
(14) Avions Marcel Dassault—Breguet Aviation Mercure 100C, TCDS No. A40EU.
(15) Airbus Caravelle, TCDS No. 7A6.
(16) Lockheed L–300, TCDS No. A2S0.
(17) Boeing 707–100/–200, TCDS No. 4A21.
(18) Boeing 707–300/–400, TCDS No. 4A26.
(19) Boeing 720, TCDS No. 4A28.

§ 26.45 Holders of type certificates—Alterations and repairs to alterations.

(a) *Applicability.* This section applies to transport category airplanes subject to § 26.43.

(b) *Fatigue critical alteration structure.* For existing and future alteration data developed by the holder of a type certificate, the holder must—

(1) Review existing alteration data and identify all alterations that affect fatigue critical baseline structure identified under § 26.43(b)(1);

(2) For each alteration identified under paragraph (b)(1) of this section, identify any fatigue critical alteration structure;

(3) Develop and submit to the FAA Oversight Office for review and approval a list of the structure identified under paragraph (b)(2) of this section; and

(4) Upon approval, make the list required in paragraph (b)(3) of this section available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(c) *DT Data.* For existing and future alteration data developed by the holder of a type certificate that affect fatigue critical baseline structure identified under § 26.43(b)(1), unless previously accomplished, the holder must—

(1) Perform a DTE and develop the DTI for the alteration and fatigue critical baseline structure that is affected by the alteration;

(2) Submit the DT data developed in accordance with paragraphs (c)(1) of this section to the FAA Oversight Office or its properly authorized designees for review and approval; and

(3) Upon approval, make the DTI available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(d) *DT Data for Repairs Made to Alterations.* For existing and future repair data developed by a holder of a type certificate, the type certificate holder must—

(1) Review the repair data, and identify each repair that affects any fatigue critical alteration structure identified under paragraph (b)(2) of this section;

(2) For each repair identified under paragraph (d)(1) of this section, unless previously accomplished, perform a DTE and develop DTI;

(3) Submit the DT data developed in accordance with paragraph (d)(2) of this section to the FAA Oversight Office or its properly authorized designees for review and approval; and

(4) Upon approval, make the DTI available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(e) *Compliance times.* Holders of type certificates must submit the following to the FAA Oversight Office or its properly authorized designees for review and approval by the specified compliance time:

(1) The list of fatigue critical alteration structure identified under paragraph (b)(3) of this section must be submitted no later than 360 days after January 11, 2008.

(2) For alteration data developed and approved before January 11, 2008, the DT data required by paragraph (c)(2) of this section must be submitted by June 30, 2009.

(3) For alteration data approved on or after January 11, 2008, DT data required by paragraph (c)(2) of this section must be submitted before initial approval of the alteration data.

(4) For repair data developed and approved before January 11, 2008, the DT data required by paragraph (d)(2) of this section must be submitted by June 30, 2009.

(5) For repair data developed and approved after January 11, 2008, the DT data required by paragraph (d)(2) of this section must be submitted within 12 months after initial approval of the repair data and before making the DT data available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

§ 26.47 Holders of and applicants for a supplemental type certificate—Alterations and repairs to alterations.

(a) *Applicability.* This section applies to transport category airplanes subject to § 26.43.

(b) *Fatigue critical alteration structure.* For existing structural alteration data approved under a supplemental certificate, the holder of the supplemental certificate must—

(1) Review the alteration data and identify all alterations that affect fatigue critical baseline structure identified under § 26.43(b)(1);

(2) For each alteration identified under paragraph (b)(1) of this section, identify any fatigue critical alteration structure;

(3) Develop and submit to the FAA Oversight Office for review and approval a list of the structure identified under paragraph (b)(2) of this section; and

(4) Upon approval, make the list required in paragraph (b)(3) of this section available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(c) *DT Data.* For existing and future alteration data developed by the holder of a supplemental type certificate that affect fatigue critical baseline structure identified under § 26.43(b)(1), unless previously accomplished, the holder of a supplemental type certificate must—

(1) Perform a DTE and develop the DTI for the alteration and fatigue critical baseline structure that is affected by the alteration;

(2) Submit the DT data developed in accordance with paragraphs (c)(1) of this section to the FAA Oversight Office or its properly authorized designees for review and approval; and

(3) Upon approval, make the DTI available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(d) *DT Data for Repairs Made to Alterations.* For existing and future repair data developed by the holder of a supplemental holder of a supplemental type certificate, the holder of a supplemental type certificate must—

(1) Review the repair data, and identify each repair that affects any fatigue critical alteration structure identified under paragraph (b)(2) of this section;

(2) For each repair identified under paragraph (d)(1) of this section, unless previously accomplished, perform a DTE and develop DTI;

(3) Submit the DT data developed in accordance with paragraph (d)(2) of this section to the FAA Oversight Office or its properly authorized designees for review and approval; and

(4) Upon approval, make the DTI available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(e) *Compliance times.* Holders of supplemental type certificates must submit the following to the FAA

Oversight Office or its properly authorized designees for review and approval by the specified compliance time:

(1) The list of fatigue critical alteration structure required by paragraph (b)(3) of this section must be submitted no later than 360 days after January 11, 2008.

(2) For alteration data developed and approved before January 11, 2008, the DT data required by paragraph (c)(2) of this section must be submitted by June 30, 2009.

(3) For alteration data developed after January 11, 2008, the DT data required by paragraph (c)(2) of this section must be submitted before approval of the alteration data and making it available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

(4) For repair data developed and approved before January 11, 2008, the DT data required by paragraph (d)(2) of this section must be submitted by June 30, 2009.

(5) For repair data developed and approved after January 11, 2008, the DT data required by paragraph (d)(2) of this section, must be submitted within 12 months after initial approval of the repair data and before making the DT data available to persons required to comply with §§ 121.1109 and 129.109 of this chapter.

§ 26.49 Compliance plan.

(a) *Compliance plan.* Except for applicants for type certificates and supplemental type certificates whose applications are submitted after January 11, 2008, each person identified in §§ 26.43, 26.45, and 26.47, must submit a compliance plan consisting of the following:

(1) A project schedule identifying all major milestones for meeting the compliance times specified in §§ 26.43(f), 26.45(e), and 26.47(e), as applicable.

(2) A proposed means of compliance with §§ 26.43, 26.45, and 26.47, as applicable.

(3) A plan for submitting a draft of all compliance items required by this subpart for review by the FAA Oversight Office not less than 60 days before the applicable compliance date.

(b) *Compliance dates for compliance plans.* The following persons must submit the compliance plan described in paragraph (a) of this section to the FAA Oversight Office for approval on the following schedule:

(1) For holders of type certificates, no later than 90 days after January 11, 2008.

(2) For holders of supplemental type certificates no later than 180 days after January 11, 2008.

(3) For applicants for changes to type certificates whose application are submitted before January 11, 2008, no later than 180 days after January 11, 2008.

(c) *Compliance Plan Implementation.* Each affected person must implement the compliance plan as approved in compliance with paragraph (a) of this section.

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

■ 4. The authority citation for part 121 continues to read as follows:

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

■ 5. Amend § 121.1109 to revise paragraph (c) to read as follows:

§ 121.1109 Supplemental inspections.

* * * * *

(c) *General requirements.* After December 20, 2010, a certificate holder may not operate an airplane under this part unless the following requirements have been met:

(1) *Baseline Structure.* The certificate holder's maintenance program for the airplane includes FAA-approved damage-tolerance-based inspections and procedures for airplane structure susceptible to fatigue cracking that could contribute to a catastrophic failure. For the purpose of this section, this structure is termed ''fatigue critical structure.''

(2) *Adverse effects of repairs, alterations, and modifications.* The maintenance program for the airplane includes a means for addressing the adverse effects repairs, alterations, and modifications may have on fatigue critical structure and on inspections required by paragraph (c)(1) of this section. The means for addressing these adverse effects must be approved by the FAA Oversight Office.

(3) *Changes to maintenance program.* The changes made to the maintenance program required by paragraphs (c)(1) and (c)(2) of this section, and any later revisions to these changes, must be submitted to the Principal Maintenance Inspector for review and approval.

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

■ 6. The authority citation for part 129 continues to read as follows:

Authority: 49 U.S.C. 1372, 49113, 440119, 44101, 44701–44702, 447–5, 44709–44711, 44713, 44716–44717, 44722, 44901–44904, 44906, 44912, 44105., Pub. L. 107–71 sec. 104.

■ 7. Amend 129.109 by revising paragraph (b) to read as follows:

§ 129.109 Supplemental inspections for U.S.-registered aircraft.

* * * * *

(b) *General requirements.* After December 20, 2010, a certificate holder may not operate an airplane under this part unless the following requirements have been met:

(1) *Baseline Structure.* The certificate holder's maintenance program for the airplane includes FAA-approved damage-tolerance-based inspections and procedures for airplane structure susceptible to fatigue cracking that could contribute to a catastrophic failure. For the purpose of this section, this structure is termed ''fatigue critical structure.''

(2) *Adverse effects of repairs, alterations, and modifications.* The maintenance program for the airplane includes a means for addressing the adverse effects repairs, alterations, and modifications may have on fatigue critical structure and on inspections required by paragraph (b)(1) of this section. The means for addressing these adverse effects must be approved by the FAA Oversight Office.

(3) *Changes to maintenance program.* The changes made to the maintenance program required by paragraph (b)(1) and (b)(2) of this section, and any later revisions to these changes, must be submitted to the Principal Maintenance Inspector for review and approval.

Robert A. Sturgell,

Acting Administrator.

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