U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

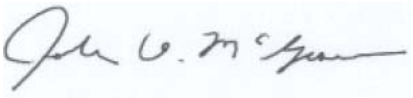
Subject: Maintenance Review Board Report Maintenance Type Board, and OEM/TCH Inspection Program Procedures

Date: 10/29/10 **AC No:** 121-22B
Initiated by: AFS-300 **Change:**

FOREWORD

This advisory circular (AC) provides guidelines that industry may use to develop and revise the minimum scheduled interval/tasking requirements for derivative or newly type-certificated aircraft and powerplants for Federal Aviation Administration (FAA) approval. This AC refers to these minimum scheduled interval/tasking requirements as the Maintenance Review Board Report (MRBR), Maintenance Type Board. After FAA approval, the requirements become a basis upon which operators develop their own individual maintenance programs. The report will become a living report for each type-certificate holder.

Use this AC to standardize development, implementation, and update of FAA-approved minimum scheduled maintenance/inspection requirements.

 for

John M. Allen
Director, Flight Standards Service

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CHAPTER 1. CREATING AND USING MAINTENANCE/ INSPECTION REQUIREMENTS

1-1. PURPOSE. This advisory circular (AC) provides guidelines that industry may use to develop and revise the minimum scheduled interval/tasking requirements for derivative, or newly type-certificated aircraft and powerplants for Federal Aviation Administration (FAA) approval. This AC refers to these minimum scheduled interval/tasking requirements as the Maintenance Review Board Report (MRBR) Maintenance Type Board (MTB). After FAA approval, the requirements become a basis upon which operators develop their own individual maintenance programs. The report will become a living report for each type-certificate holder (TCH).

1-2. CANCELLATION. This AC cancels AC 121-22A, Maintenance Review Board Procedures, dated March 7, 1997.

1-3. RELATED TITLE 14 OF THE CODE OF FEDERAL REGULATIONS (14 CFR). Parts 21, 23, 25, 27, 29, 33, 35, 91, 119, 121, 129, and 135 apply.

1-4. AUDIENCE. Guidance in this AC pertains to FAA personnel, air operators, air carriers, and original equipment manufacturer (OEM)/TCH and their vendors involved in the development of the MRBR process.

1-5. USE OF THIS AC. This AC is not mandatory and is not the only means to comply with the regulations. The FAA issues this AC for guidance and to outline a method of compliance. A person may elect to follow an alternative method, provided the FAA finds it to be an acceptable means of complying with the applicable requirements of 14 CFR. If you use the methods described in this AC you must follow them in all respects. The FAA derived these guidelines from regulatory authorities and aviation industry experience. This AC is primarily designed to provide advice and recommendations for the standardized development, implementation, and update of FAA-approved minimum scheduled maintenance/inspection requirements

> **NOTE: This AC uses the term "must" only in the sense of ensuring the applicability of these particular methods of compliance when operators use the acceptable means of compliance described herein. This AC does not change regulatory requirements and does not authorize changes in, or deviations from, regulatory requirements.**

1-6. RELATED FAA ORDERS (current editions).

- Order 1100.5, FAA Organization—Field.
- Order 8100.5, Aircraft Certification Service Mission, Responsibilities, Relationships, and Programs.
- Order 8110.4, Type Certification.
- Order 8110.54, Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents.

- Order 8900.1, Flight Standards Information Management System.
- Order 8300.12, Corrosion Prevention and Control Programs.
- Order 8430.21, Flight Standards Division, Aircraft Certification Division and Aircraft Evaluation Group Responsibilities.

1-7. RELATED FAA ACs (current editions).

- AC 20-107, Composites Aircraft Structure.
- AC 20-136, Protection of Aircraft Electrical/Electronic Systems Against the Indirect Effects of Lightning.
- AC 20-158, The Certification of Aircraft Electrical and Electronic Systems for Operation in the High-Intensity Radiated Fields (HIRF) Environment.
- AC 23-1309-1, System Safety Analysis and Assessment for Part 23 Airplanes.
- AC 25-19, Certification Maintenance Requirements.
- AC 25-27, Development of Transport Category Airplane Electrical Wiring Interconnection Systems Instructions for Continued Airworthiness Using an Enhanced Zonal Analysis Procedure.
- AC 27-1, Certification of Normal Category Rotorcraft.
- AC 29-2, Certification of Transport Category Rotorcraft.
- AC 33.4-3, Instructions for Continued Airworthiness, Aircraft Engine High Intensity Radiated Fields (HIRF) and Lightning Protection Features.
- AC 120-42, Extended Operations (ETOPS and Polar Operations).

1-8. RELATED READING MATERIAL (current editions).

- CMH-17, Composites Materials Handbook.
- Evolution/Optimization Guidelines, International Maintenance Review Board Policy Board Issue Paper 44.
- Transport Canada TP 13850, Schedule Maintenance Instruction Development Process Manual.

- ATA MSG-3, Operator/Manufacturer Scheduled Maintenance Development, current edition available from:

Air Transport Association of America (ATA),
1301 Pennsylvania Avenue N.W., Suite 1100
Washington, DC 20004–1707
1-800-497-3326 Ext. 950

CHAPTER 2. MAINTENANCE PROGRAM OVERVIEW

2-1. TIMELINE OF MAINTENANCE STEERING GROUP (MSG) ACTIONS.

a. History. The development of maintenance programs dates to Aeronautical Bulletin 7E of May 15, 1930. The process of developing maintenance programs for new aircraft and aircraft engines has evolved from one in which each air carrier proposed its own unique program to a collaborative effort in which the Federal Aviation Administration (FAA), associated foreign regulatory authorities, and industry collaborated to develop the initial minimum scheduled maintenance/inspection requirements for new and derivative aircraft, aircraft engines, and propellers. Early experience in the development of initial scheduled maintenance/inspection requirements revealed that through the use of logical analysis and decision processes, it was possible to develop a program of applicable and effective maintenance tasks. In 1968 the Maintenance Steering Group—1st Task Force developed maintenance requirements decision and analysis logic.

b. Role of the Maintenance Steering Group. In 2006, the Air Transportation Association of America (ATA) MSG was named the Maintenance Programs Industry Group (MPIG), while the latest version of MSG still retained the same original title. ATA coordinates, and industry chairs the MPIG; it assumed the same duties as the original MSG task force. MPIG meets annually, or as required, to review issues submitted by industry and the regulatory authorities affecting the latest version of MSG and institute improvements or any necessary evolutionary changes due to revised regulatory requirements or advances in industry technology.

(1) Handbook—Maintenance Evaluation and Program Development, MSG-1 (July 10, 1968). The FAA and industry used MSG-1 procedures to develop the initial minimum scheduled maintenance/inspection recommendations for the B-747-100 aircraft and its engines. A task force later used the experience gained on the B-747-100 project to update the MSG-1 procedures so that a universal document could be made applicable for future newly type-certificated aircraft and/or engines. This document was called the Maintenance Steering Group—2nd Task Force (MSG-2) document.

(2) Specification Maintenance Program Development, MSG-2 (January 8, 1970). In the 1970s, the FAA and industry used the MSG-2 procedures to develop the initial minimum scheduled maintenance/inspection recommendations for aircraft and engines. In 1980, the combined efforts of the FAA, ATA interval/tasking requirements, United States and European aircraft and engine manufacturers, and U.S. and foreign airlines generated new decision logic and analysis procedures contained in a new document called Maintenance Steering Group-3rd Task Force, MSG-3.

(3) Airline/Manufacturer Maintenance Program Development Document MSG-3, Original Revision (September 30, 1980). In 1987, after applying MSG-3 analysis procedures on a number of new aircraft and engines in the first half of the 1980s, the airline industry decided that the benefits of the experience gained during those years should be used to improve the document for future applications. Thus, Revision 1 to MSG-3 was developed.

(4) Airline/Manufacturer Maintenance Program Development Document MSG-3, Revision 1 (March 31, 1988). The FAA and industry began applying MSG-3 Revision 1 in 1988 for the ongoing development of new aircraft and aircraft engine Maintenance Review Board (MRB) Report (MRBR) documents.

(5) Airline/Manufacturer Maintenance Program Development Document MSG-3, Revision 2 (September 12, 1993). Further refinements made to the MSG-3 Revision 1 analysis resulted in Revision 2 to MSG-3. In 1993, the FAA and industry began applying MSG-3 R2 for development of new and derivative aircraft and engine MRBR documents.

(6) ATA MSG-3 Operator/Manufacturer Scheduled Maintenance Program Development, Revision 2001 (March 2000). This version was reformatted into an electronic document to adapt to the use of computer technology.

(7) ATA MSG-3 Operator/Maintenance Program Development, Revision 2001.1 (February 2001). To include the large corporate aircraft and aging large transport legacy aircraft segment in the MSG-3 process, the FAA and industry began using MSG-3 Revision 2001.1 in 2001. This revision introduced significant changes including inspection definitions, corrected terminology, and expanded wording on safety/emergency equipment. Also, with the advent in the manufacturer development of more technologically advanced fly-by-wire aircraft and to improve safety of the legacy transport aircraft, it became necessary to introduce sections on enhanced zonal analysis procedures (EZAP) and Lightning/High Intensity Radiated Field (L/HIRF) protection.

(8) ATA MSG-3 Operator/Manufacturer Scheduled Maintenance Development, Revision 2002.1 (March 2002). Significant changes at this revision included recording of all assumptions, consideration of all vendor recommendations, procedures for fault-tolerant systems, Master Minimum Equipment List considerations, and the inclusion of analysis of nonmetallic structures.

(9) ATA MSG-3 Operator/Manufacturer Scheduled Maintenance Development, Revision 2003.1 (March 2003). Most significant changes added three-letter task abbreviations/acronyms, further revised fault-tolerant systems procedures, definition changes for fault-tolerant systems, and further clarification of definition of safety/emergency systems or equipment.

(10) ATA MSG-3 Operator/Manufacturer Scheduled Maintenance Development. Revision 2005.1 (March 2005). Changes introduced in this version added the need to identify design features that affect fuel tank safety, defined differentiation of Structural Significant Items and Principal Structural Elements, corrected the relation of fatigue damage (FD) to nonmetallic materials, revised EZAP to reflect recommendations from FAA's Aging Transport Systems Rulemaking Advisory Committee's on aging wiring and added definition for electrical wiring interconnection system.

(11) ATA MSG-3 Operator/Manufacturer Scheduled Maintenance Development. Revision 2007.1 (April 2007). Changes introduced in this version expanded text to better define and consider structural wear damage. This change added text and a flow chart to better define

Certification Maintenance Requirements. This revision also added text and revised flowcharts to clarify the FD logic. It was a major rewrite of the L/HIRF protection systems.

(12) ATA MSG-3 Operator/Manufacturer Scheduled Maintenance Development Revision 2009.1 (December 2009). Changes introduced in this version added structural health monitoring and scheduled structural health monitoring concepts and revised fatigue damage. This change added note requiring General Visual Inspections developed from Category 5 or 8 logic be retained as system and powerplant tasks, and not to become covered by zonal inspections.

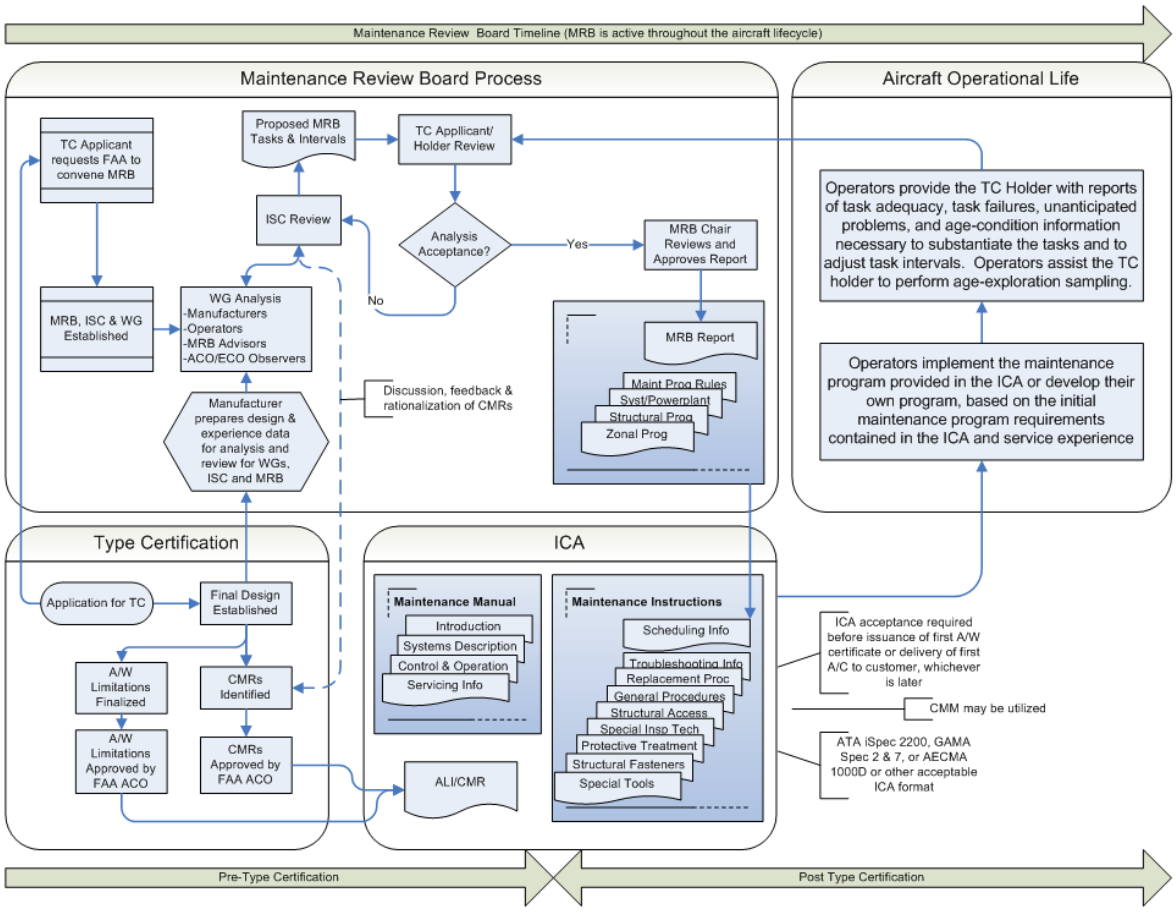
2-2. MAINTENANCE REVIEW BOARD REPORT.

a. Purpose of an MRBR. Industry and regulatory authorities generate an MRBR as a coordinated effort of achieving timely compliance with the applicable certification regulatory requirements and the minimum scheduled airworthiness suitability requirements. An MRBR contains the minimum scheduled interval/tasking requirements for a particular aircraft and on-wing engine maintenance programs. Develop the MRBR in accordance with the guidelines in this AC. Any additional requirements developed, employing different ground rules using MSG-3 must be submitted with selection criteria to the Industry Steering Committee and the regulatories for consideration and inclusion in the MRBR. Do not confuse the MRBR requirements with an operator maintenance program. After FAA approval, the requirements become a base or framework around which each operator can develop its own individual aircraft maintenance program.

b. Use of the MSG Analysis Process. You must use the latest version of the Air Transportation Association of America Maintenance Steering Group (MSG) analysis process and procedures for the development of an MRBR for all new, derivative, and optimization of aircraft and engines. Reapplication for a TC requires using the most recent latest version of the MSG logic process. The FAA no longer supports MSG-2 at the committee or working group level. Each OEM/TCH is responsible for supporting the regulatory requirements for their MSG-2 aircraft.

c. Approval of an Operator's Program Performance. Aircraft/engine design and performance form the MRBR requirements. Operators' program performance is the responsibility of the local regulatory authority. The FAA must approve an operator's aircraft maintenance program and methods used to implement these MRBR requirements. Refer to Figure 2-1.

FIGURE 2-1. MRB PROCESS FLOWCHART



2-3. MRB REPORT PROPOSAL DELIVERY SCHEDULE GUIDELINES. The original equipment manufacturer (OEM)/type certificate holder (TCH) may concurrently build the MRBR proposal (MRBRP). Portions of the MRBRP may be submitted for consideration when the design is frozen and applicable minimum scheduled interval/tasking requirements become mature and complete. This will improve the quality of the proposal by reducing discrepancies at the end of the process. The OEM/TCH Policy and Procedures Handbook (PPH) must be approved/accepted before the start of any working group meetings. Deliver all work group data packages and documents to the regulatory authorities 30 working days before scheduled meetings. Deliver the final MRBP and any supporting documents to the MRB chairperson 90 working days before expected approval of the document.

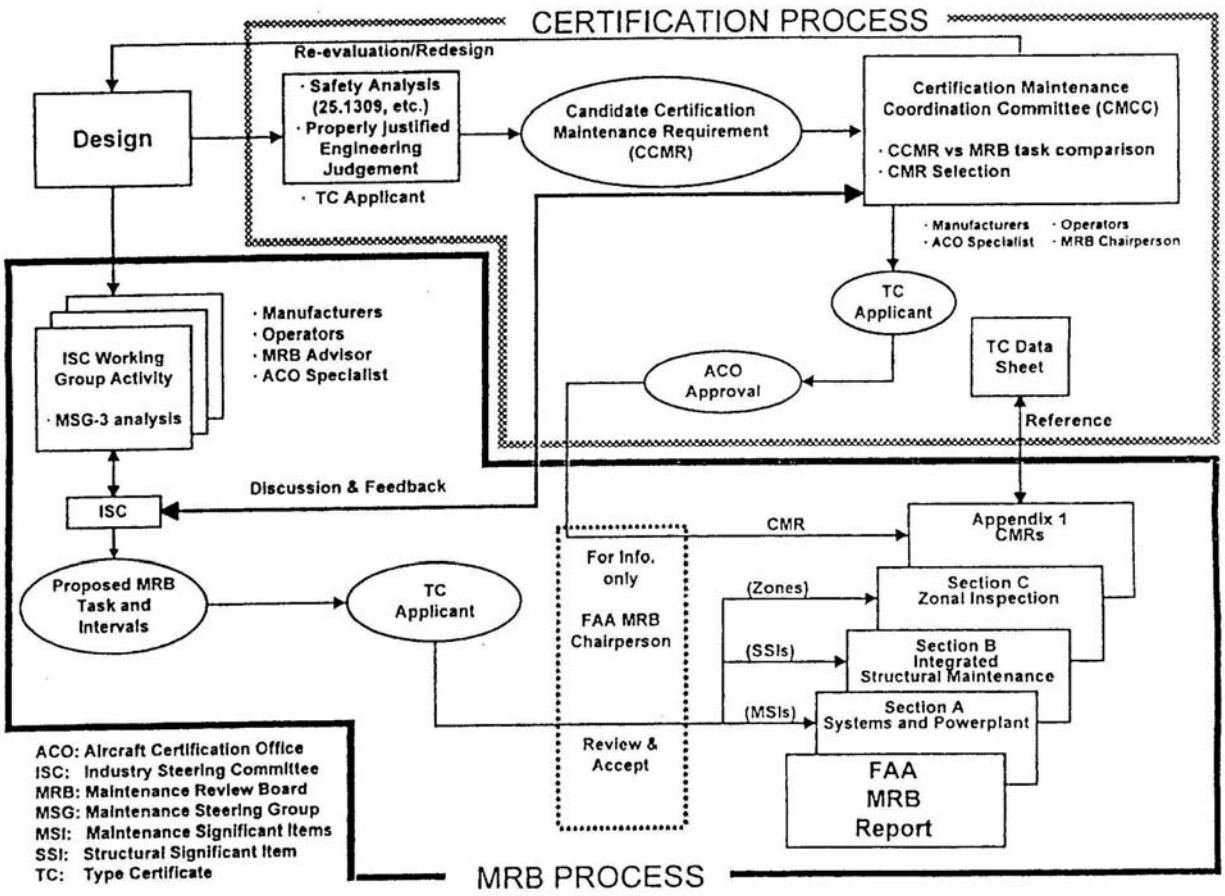
2-4. MINIMUM SCHEDULED INTERVAL/TASKING REQUIREMENTS. The OEM/TCH must develop internal instructions and guidelines to enable the validation of all maintenance procedures written to support MRBR tasks, and then the OEM/TCH must validate them. The objective of the validation is to ensure that the procedure is possible to perform and that the procedure meets the intent of the MRBR task. At a minimum where and when requested by FAA, the OEM/TCH must make available a completed aircraft and the necessary qualified maintenance personnel to demonstrate to the FAA that Failure Effect Category 5 and 8 safety

tasks, can be adequately performed and that the procedure meets the intent of the MRB task. Additional tasks may be validated at FAA's discretion.

> **NOTE: Figure 2-1 outlines the relationships between the various documents involved in the creation of the minimum scheduled interval/tasking requirements, including the MRBR.**

2-5. CERTIFICATION MAINTENANCE REQUIREMENTS (CMR). During aircraft design certification and concurrent with the MRB process, leading up to the type certification process, the OEM/TCH accomplishes an analysis, in accordance with Title 14 of the Code of Federal Regulations (14 CFR) part 23, § 23.1309; part 25, § 25.1309; part 27, § 27.1309; and part 29, § 29.1309. The analysis intends to detect any safety-significant latent failures that would, in combination with one or more other specific failures or events, result in a hazardous or catastrophic condition. This system safety assessment leads to a design decision to create a candidate CMR. A MSG Category 9 task may not take credit for candidate CMR. For further information regarding this subject please see the current editions of Advisory Circulars (AC) 23.1309-1, System Safety Analysis and Assessment for Part 23 Airplanes; AC 25-1309-1, System Design and Analysis; 25-19, Certification Maintenance Requirements; AC 27-1, Certification of Normal Category Aircraft; and AC 29-2, Certification of Transport Category Rotorcraft. Refer to Figure 2-2.

FIGURE 2-2. CERTIFICATION MAINTENANCE REQUIREMENT AND MRB PROCESS INTERFACE



CHAPTER 3. INDUSTRY PARTICIPATION

3-1. INDUSTRY STEERING COMMITTEE. The original equipment manufacturer (OEM)/type certificate holder (TCH) will work with the expected participating operators of the aircraft, the engine OEM/TCH, and other product vendors to form an industry steering committee (ISC) to address the minimum scheduled interval/tasking requirements for the aircraft and engines. Representatives from aircraft, engine, propeller, and appliance manufacturers, and intended operators normally comprise the ISC. Its chairperson will work with the Federal Aviation Administration (FAA) MRB chairperson, who is responsible for coordinating with other participating regulatory authorities to (1) develop and establish a Policy and Procedures Handbook (PPH) for the development of the MRB Report (MRBR) proposal; and (2) direct the activities of the working groups (WG) and prepare the MRBR. Under the direction of the selected ISC chairperson, the ISC will perform the functions in the PPH, listed in paragraph 3-2. As applicable, the following information should be in each PPH. Assemble the PPH in this basic format per Appendix 3.

3-2. ISC FUNCTIONS. Perform these functions:

a. Approve the PPH and forward it to the MRB chairperson for review and acceptance. The FAA MRB chairperson will direct to the OEM/TCH further comments during the MRB PPH review process. The ISC must approve the initial PPH and all subsequent revisions; the FAA must accept them before any WG meetings can begin.

b. Determine the number and type of each WG that will be necessary and then organize and manage those groups. The ISC will ensure that a minimum of three separate operators attend each WG meeting.

c. Provide the MRB chairperson with a list of the number and various type of each WG, the name and affiliation of each member, and any subsequent personnel changes.

d. Arrange for required aircraft technical/MSG training for all ISC and WG members, and FAA/regulatory authorities.

e. Invite the MRB chairperson and selected MRB members to ISC meetings.

f. Invite other regulatory authorities to ISC and WG meetings, with concurrence and coordination of the MRB chairperson.

g. Attend ISC/MRB meetings.

h. Review all WG analyses and presentations. Return to the WG for further review analysis with which the ISC does not concur. The ISC must establish a tracking system to resolve these actions and issues.

i. ISC will accept the WG analyses/tasks.

j. Provide complete and accurate meeting minutes for all ISC and WG meetings. Establish a method of distributing and tracking all meeting minutes.

k. Establish a tracking system to ensure resolution of all maintenance issues and open action items or concerns. Document and resolve all maintenance issues and open action items before presenting an MRBR proposal to the MRB chairperson.

l. Provide to the appropriate MRB members all supporting technical data/analysis for the proposed MRBR.

m. Review and provide comments on proposed MRBR.

3-3. MSG WORKING GROUPS. Appropriate representatives of the OEM/TCH (aircraft/engine), vendors, owners, operators, maintenance organizations and regulatory authorities must comprise WGs. An industry representative will chair the WG; he or she is selected by the WG and accepted by the ISC. WG responsibilities include the following functions additional to those included in paragraph 3-2:

a. Develop minimum scheduled interval/tasking requirements for new or derivative aircraft/engine using the latest revision of the MSG process and latest approved PPH.

b. Establish sampling requirements when an analysis determines that such sampling is applicable and effective in the identification of the cause of failure.

c. Produce a set of meeting minutes for each WG activity.

3-4. OEM/TCH FUNCTIONS. The OEM/TCH will perform the following functions:

a. Develop and prepare a draft PPH for ISC approval.

b. Provide required aircraft technical/MSG training for all ISC and WG members, and FAA/regulatory authorities before holding the first WG meeting.

c. Provide the ISC with a comprehensive list of Maintenance Significant Items (MSI) and Structural Significant Items (SSI), and the items precluded from the MSI/SSI list before beginning any ISC/WG meeting.

d. Arrange for the required attendance of the appropriate OEM/TCH design personnel at each ISC/WG meeting.

e. Provide WG members with current technical data to support the analysis of each MSI, SSI, and zones of the aircraft for analysis by each WG. The data are required 30 days before the ISC/WG meeting.

f. Arrange for technical support and access to the aircraft or appropriate OEM/TCH and or vendor facility for the review and validation of all analysis and tasks.

g. Provide the ISC/MRB and appropriate WG members, during each ISC/MRB meeting, with an updated report of all Airworthiness Limitation (ALI) item, Certification Maintenance Requirements (CMR), and all design changes.

h. Ensure that the OEM/TCH manuals contain information and procedures for accomplishing all on-aircraft systems/structures/zonal tasks covered in the MRBR.

i. Participate in all ISC and WG activities in support of the development of the MRBR.

j. Provide the MRB chairperson a copy of all supporting technical data/analysis for the proposed MRBR at the conclusion of the project.

k. Submit the MRBR proposal to the MRB chairperson at least 90 working days before scheduled approval.

NOTE: Where the OEM/TCH conduct sampling and analytical inspections on an opportunity basis, the following procedures apply: (1) The OEM/TCH will provide timely notification to the MRB chairperson or delegate regarding the time and location of the inspection to permit MRB chairperson or delegate participation. When the MRB chairperson or delegate attendance is not possible, the OEM/TCH must provide a copy of the complete inspection report to the MRB chairperson. (2) Subsequent to the first three inspections of the complete engine or modules, the MRB chairperson in coordination with the Boston Aircraft Evaluation Group will determine further regulatory authority participation on a case-by-case basis on technical issues only.

CHAPTER 4. FAA PARTICIPATION

4-1. UNITED STATES OEM/TCH. The original equipment manufacturer (OEM)/type certificate holder (TCH) formally notifies the responsible Aircraft Evaluation Group (AEG) manager of its intention to develop a Maintenance Review Board (MRB) Report (MRBR) proposal.

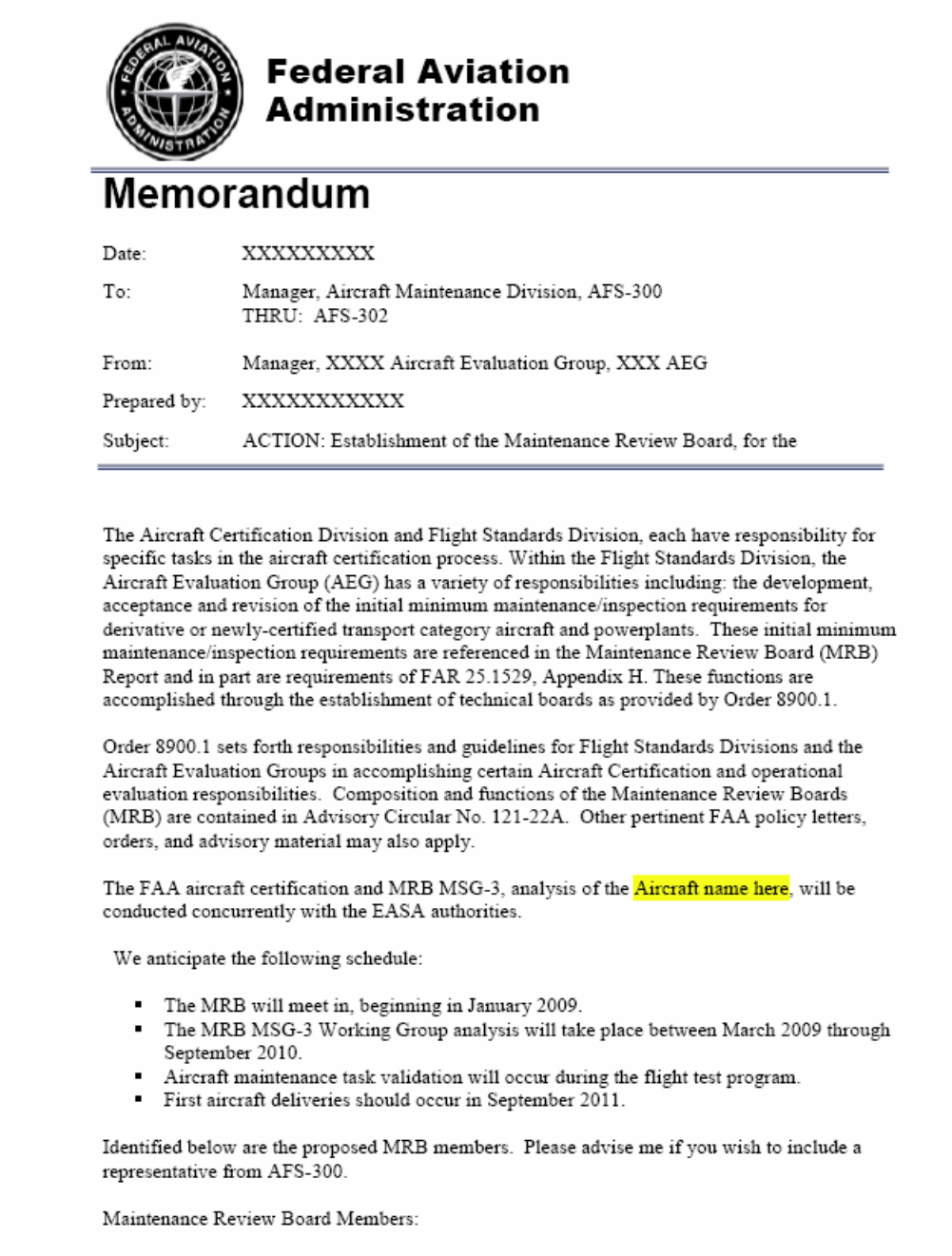
a. Assigning an MRB Chairperson. The appropriate AEG manager will assign a qualified individual as MRB chairperson to manage the specific MRB process for the Federal Aviation Administration (FAA). The MRB chairperson selects and manages additional MRB members. Through the appropriate division/office manager, the MRB chairperson will formally invite experienced and qualified FAA working group (WG) advisors to participate in each WG. Acceptance to participate is considered a commitment for the duration of the project.

b. Notification of MRB Composition. The MRB chairperson will provide formal written notification to AFS-302 of the MRB board composition. Refer to Figure 4-1. The MRB chairperson will also invite AFS-302 or his or her representative, along with an invitation to the Maintenance Program Industry Group (MPIG) chairperson, to participate in the MRB process.

c. Coordination With Aircraft Certification. The FAA MRB chairperson is also responsible for coordination on all issues of concern with FAA certification within the appropriate Aircraft Certification project manager and engineering staff. This may require developing issue papers and responding to Aircraft Certification issue papers or seeking consultation on new technological issues that may arise during the design and development process of the aircraft.

d. Assignment of MRB Members. The MRB chairperson will assign an FAA MRB member to each WG. The MRB chairperson may assign additional FAA advisors to each WG if necessary. FAA WG advisors will include staff from FAA engineering/design certification branches as well as appropriate aviation safety inspectors from Flight Standards Service (AFS) having oversight of aircraft maintenance operations, and AEG personnel.

FIGURE 4-1. LETTER TO AFS-300 TO ESTABLISH AN MRB



Federal Aviation Administration

Memorandum

Date: XXXXXXXXX

To: Manager, Aircraft Maintenance Division, AFS-300
THRU: AFS-302

From: Manager, XXXX Aircraft Evaluation Group, XXX AEG

Prepared by: XXXXXXXXXXX

Subject: ACTION: Establishment of the Maintenance Review Board, for the

The Aircraft Certification Division and Flight Standards Division, each have responsibility for specific tasks in the aircraft certification process. Within the Flight Standards Division, the Aircraft Evaluation Group (AEG) has a variety of responsibilities including: the development, acceptance and revision of the initial minimum maintenance/inspection requirements for derivative or newly-certified transport category aircraft and powerplants. These initial minimum maintenance/inspection requirements are referenced in the Maintenance Review Board (MRB) Report and in part are requirements of FAR 25.1529, Appendix H. These functions are accomplished through the establishment of technical boards as provided by Order 8900.1.

Order 8900.1 sets forth responsibilities and guidelines for Flight Standards Divisions and the Aircraft Evaluation Groups in accomplishing certain Aircraft Certification and operational evaluation responsibilities. Composition and functions of the Maintenance Review Boards (MRB) are contained in Advisory Circular No. 121-22A. Other pertinent FAA policy letters, orders, and advisory material may also apply.

The FAA aircraft certification and MRB MSG-3, analysis of the Aircraft name here, will be conducted concurrently with the EASA authorities.

We anticipate the following schedule:

- The MRB will meet in, beginning in January 2009.
- The MRB MSG-3 Working Group analysis will take place between March 2009 through September 2010.
- Aircraft maintenance task validation will occur during the flight test program.
- First aircraft deliveries should occur in September 2011.

Identified below are the proposed MRB members. Please advise me if you wish to include a representative from AFS-300.

Maintenance Review Board Members:

FIGURE 4-1. LETTER TO AFS-300 TO ESTABLISH AN MRB (CONTINUED)

Chairperson	LGB AEG
Powerplants/Air Systems/APU	BOS AEG
Avionics/Electrical	LGB AEG
Mechanical Systems	AEA FRG FSDO-11
Structural/Zonal/HIRF	AGL DPA FSDO-03

The chairperson of this board is responsible for planning the boards functions, coordinating functions with the aircraft manufacturer and other concerned FAA offices and resolving any technical deficiencies. The chairperson will be guided by established processes and procedures in accomplishing assigned tasks. The members of the board will be responsible for technical input, consultation and development of technical recommendation in support of accomplishing assigned objectives. Technical guidance and direction to the board is available through the appropriate AEG office Manager, Flight Standards Division, and Manager, Aircraft Maintenance Division.

4-2. FOREIGN OEM/TCH.

a. MRB Chairperson for Certification of Foreign Aircraft. During the certification process of a foreign-manufactured aircraft, the applicant will formally request FAA participation from the appropriate AEG. The AEG office manager will assign a qualified FAA MRB chairperson who will perform the duties as the FAA representative on the international MRB/industry steering committee (ISC).

b. Responsibilities of FAA MRB Chairperson.

(1) This FAA MRB chairperson is the counterpart to the international MRB chairperson in all matters concerning MRB activities and MSG processes. The MRB chairperson is the sole authority regarding United States FAA requirements. The chairperson also provides the collective input from all the FAA advisors regarding WG activities. The primary duty is to ensure compliance with the applicable Title 14 of the Code of Federal Regulations (14 CFR) minimum interval/tasking requirements/FAA regulatory requirements. Also, to the extent possible, the chairperson ensures standardization and harmonization of the domestic and international MRB activities within the international MRB process.

(2) Regarding all issues of concern, the FAA MRB chairperson is also responsible for coordination with FAA certification within the appropriate Aircraft Directorate project manager and engineering staff. This may require developing issue papers and responding to certification issue papers, or seeking consultation on new technological issues that may arise during the design and development process of the aircraft.

(3) The FAA WG advisors provide assistance and guidance to WG members regarding the Policy and Procedures Handbook (PPH), latest version of MSG process, FAA policy, and regulatory requirements. The FAA advisors report directly to the FAA MRB chairperson on all matters regarding assigned WG activities, actions, results, and controversial issues.

4-3. MAINTENANCE REVIEW BOARD.

a. MRB Personnel. The MRB supports the development of an industry MRBR proposal containing the minimum scheduled interval/tasking requirements for a newly FAA type-certificated or derivative aircraft and its aircraft engines. The MRB may include qualified

FAA AFS inspector personnel, AEG personnel, and engineering representatives from the controlling FAA certification/directorate office.

b. MRB Chairperson Functions. The MRB chairperson will initiate the development of an MRB obtaining a complete schedule of all MSG process activities from the OEM/TCH. The MRB chairperson assigns MRB members or other qualified FAA personnel to work as advisors to each applicable industry WG. It is also the responsibility of the MRB chairperson to perform the functions identified in the PPH, described in Chapter 3. These include the following:

(1) Determine the number and type of qualified FAA personnel that are necessary, and assign them to their respective WG by specialty (systems, engines, avionics, structures, zonal, lighting/High Intensity Radiated Field, etc.).

(2) Provide the ISC chairperson with a list of FAA personnel names, their affiliations, assignments, and changes in personnel as they occur.

(3) Invite other regulatory authorities, in coordination with the AEG manager and the OEM/TCH, to participate in the MRB, and coordinate the activities with regulatory authorities through their representatives.

(4) Obtain letters of confirmation between the FAA and each participating regulatory authority. Refer to the template example Figure 5 Letter of Confirmation in Appendix 4.

(5) Inform the ISC chairperson of all participating regulatory authorities.

(6) Establish and maintain a file of all MRB proceedings in the MRB historical file.

(7) Establish the extent of other regulatory authority participation and assignment as WG Advisors.

(8) Keep other regulatory authorities informed regarding any changes to MRB policy and procedures before and during the MRB process.

(9) Accept the ISC-approved PPH, following a review by all participating regulatory authorities, within 30 working days of receipt.

(10) Coordinate all MRB activities and associated matters with the ISC chairperson.

(11) Ensure that the OEM/TCH provides the necessary aircraft familiarization/technical training inclusive of MSG training to all MRB members and WG advisors.

(12) Schedule the MRB meeting before attendance of ISC meetings, as required.

(13) Attend all ISC meetings and be prepared to address any previous open issues that developed during WG or ISC meetings.

(14) Ensure that the appropriate FAA and other regulatory authorities attend WG meetings.

(15) Offer information, guidance, and assistance to the ISC and each WG regarding regulatory requirements, PPH, compliance and process management, MSG noncompliance, and other related issues.

(16) Review reports from previous ISC meetings (if applicable) and from the WG members with regard to open issues or concerns.

(17) Provide oversight of the TCH/OEM validation of the Associated Maintenance Procedures.

(18) Discuss and correct potential problem areas of controversy with other regulatory authority participants and decide if FAA Maintenance Review Board Policy Board (MRBPB) guidance is needed. If required, draft an appropriate issue paper for submittal to MRBPB for resolution.

(19) Coordinate all items of new technology developments and issues not previously addressed by the MSG standard with the FAA MRBPB and international MRBPB.

(20) Approve the MRBR, and revisions, in accordance with established MRBR revision procedures.

4-4. MAINTENANCE REVIEW BOARD MEMBERS. MRB members perform the following functions:

a. Provide guidance and feedback to the FAA WG advisors and WG members.

b. Direct FAA WG advisors in assigned WG regarding compliance with the PPH and current regulatory and policy requirements.

c. Attend MRB meeting to review and discuss all significant quality problems and open issues as required.

d. Attend ISC meetings, as invited by the ISC chairperson to support regulatory and policy requirements.

e. Attend WG meetings to review and discuss all significant quality problems and open issues as required. Ensure that the WG follows the MSG process and PPH guidelines. Report any deviations from the MSG process/approved PPH procedures to MRB chairperson.

f. Review technical data and MSG analysis and PPH revisions provided by the OEM/TCH before each WG meeting, as required. The OEM/TCH must provide and deliver the data 30 working days before each meeting.

g. Record all WG activity and discussion in the meeting minutes, and record unresolved open actions/open issues in a formal ongoing action list or report.

h. Provide oversight of the TCH/OEM valiation of the associated maintenance procedures.

i. Review WG meeting minutes and provide progress reports to the MRB chairperson within 2 weeks after each WG meeting, but no later than the next scheduled ISC meeting. This review will contain an assessment of WG activities, including a notification of any controversy for potential problem areas or issues affecting the MSG process.

j. Provide the MRB chairperson with highlights to include minimum scheduled interval/tasking requirements and any unresolved WG concerns or issues.

4-5. FAA MAINTENANCE WORKING GROUP ADVISORS. FAA WG advisors perform the following functions:

a. Attend WG meetings and provide technical information, assistance, and guidance to the WG members.

b. Attend MRB meetings if requested by an MRB chairperson.

c. Act as an MRB member for the WG when requested by the MRB chairperson. Perform all the functions of the MRB member while acting as an MRB member.

4-6. FOREIGN REGULATORY AUTHORITIES. Foreign regulatory authorities will perform the following functions:

a. Participate in the MRB, ISC, and/or WG activities, as provided by the letter of confirmation between the regulatory authority and the FAA.

b. Attend ISC meetings by invitation from the ISC chairperson and the concurrence of the MRB chairperson.

c. Notify the ISC chairperson, via the MRB chairperson, of any national regulatory differences requirements before compiling the MRB report proposal.

d. Acknowledge approval of the MRB report in the manner outlined in the letter of confirmation and in the PPH.

e. Review WG meeting minutes and provide to the MRB chairperson an assessment or notification of controversial or potential problem areas before the next scheduled ISC meeting.

NOTE: If the participation of multiple regulatory authorities is necessary, do it with common standards and joint authority representation.

NOTE: When the lack of personnel or other reasons limit the role of the host authority, the MRB chairperson may seek more involvement of other regulatory authorities as MRB members/WG advisors.

NOTE: Use generic terminology when dealing with various regulatory operating rule requirements (for example, "regulations or other national regulatory requirements").

CHAPTER 5. MRB REPORT APPROVAL

5-1. INITIAL MAINTENANCE REVIEW BOARD REPORT (MRBR) APPROVAL PROCESS.

a. MRBR Proposal. The industry steering committee (ISC) chairperson forwards the Maintenance Review Board (MRB) MRBR proposal to the original equipment manufacturer (OEM)/type certificate holder (TCH) representative(s) and may invite the OEM/TCH to discuss the comments or findings. The OEM/TCH must present the ISC-proposed MRBR, as recommended, to the Federal Aviation Administration (FAA) for review as part of the instructions for continued airworthiness. Following ISC final review, the OEM/TCH submits a formal letter and the MRBR proposal to the MRB chairperson for review and approval.

b. FAA Approval Process. Concurrent with MRBR approval, the MRB chairperson will forward a copy of the MRBR with an approval recommendation to AFS-302 for their concurrence. The AFS-302 representative concurs or rejects and returns the MRBR to the assigned Aircraft Evaluation Group (AEG). If AFS-302 concurs, the MRB chairperson sends a letter of approval along with the signed approval page of the MRBR to the OEM/TCH (ISC co-chair). Refer to Figures 5-1 and 5-2, below. Should AFS-302 reject the MRBR, the assigned AEG MRB chairperson will return the report to the OEM/TCH for corrections and resubmit. The chairperson returns the corrected report to AFS-302 for their concurrence. Normally, the FAA approval process occurs within a timeframe of 90 working-days, unless corrections are required. Approval by foreign regulatory authorities will normally occur concurrently with FAA approval. The OEM/TCH is responsible for publishing and distributing the initial and revised MRBR, and any supporting documents in a format acceptable to the Administrator.

5-2. FOREIGN REGULATORY AUTHORITY APPROVAL OF THE MRB REPORT.

There may be a need to identify national regulatory differences that are not compatible, acceptable, or applicable to all regulatory authorities. When this condition exists, use an appendix or specified section to the MRBR to list these differences, with the respective regulatory authority approving each difference. If the FAA is the validating authority for a foreign MRB, then a separate appendix or specified section to the MRBR will identify regulatory differences.

5-3. PROPOSED INITIAL MRBR DISAPPROVAL PROCESS.

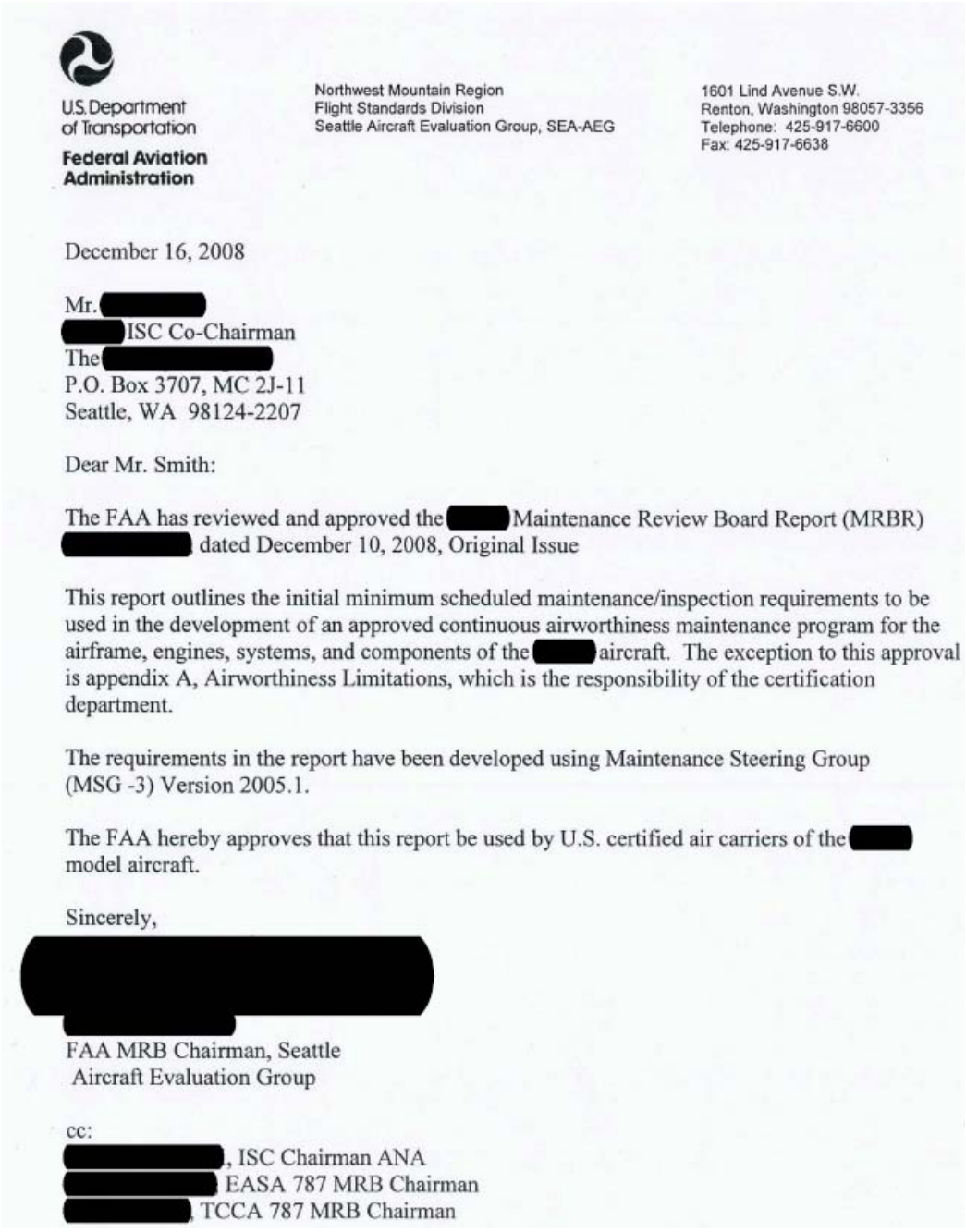
The OEM/TCH must coordinate disapproval of a proposed MRBR with the MRB chairperson so that the ISC chairperson receives written notification of such action. The disapproval letter will include the specific reason(s) for the disapproval, and suggested guidance to make the MRBR proposal approvable.

5-4. MAINTENANCE REVIEW BOARD REPORT IMPLEMENTATION.

Operators of the aircraft type should implement the Initial MRBR in accordance with established procedures. The MRBR requirements are not an operator maintenance program. After FAA approval, the requirements become a baseline or framework around which each operator can develop its own individual aircraft maintenance program. Aircraft/engine design and performance help form the MRBR requirements. The oversight of an operator’s program is the responsibility of the local regulatory authority. MRBR revisions are encouraged, but are not mandatory inclusions in an

operator's approved maintenance program. The FAA recommends the operator's program incorporate MRBR revisions associated with type design changes. The local regulatory authority must approve and/or accept all maintenance program revisions.

FIGURE 5-1. MRBR LETTER OF APPROVAL.



U.S. Department of Transportation
Federal Aviation Administration

Northwest Mountain Region
Flight Standards Division
Seattle Aircraft Evaluation Group, SEA-AEG

1601 Lind Avenue S.W.
Renton, Washington 98057-3356
Telephone: 425-917-6600
Fax: 425-917-6638

December 16, 2008

Mr. [redacted]
[redacted] ISC Co-Chairman
The [redacted]
P.O. Box 3707, MC 2J-11
Seattle, WA 98124-2207

Dear Mr. Smith:

The FAA has reviewed and approved the [redacted] Maintenance Review Board Report (MRBR) [redacted], dated December 10, 2008, Original Issue

This report outlines the initial minimum scheduled maintenance/inspection requirements to be used in the development of an approved continuous airworthiness maintenance program for the airframe, engines, systems, and components of the [redacted] aircraft. The exception to this approval is appendix A, Airworthiness Limitations, which is the responsibility of the certification department.

The requirements in the report have been developed using Maintenance Steering Group (MSG -3) Version 2005.1.

The FAA hereby approves that this report be used by U.S. certified air carriers of the [redacted] model aircraft.

Sincerely,

[redacted]
FAA MRB Chairman, Seattle
Aircraft Evaluation Group

cc:
[redacted], ISC Chairman ANA
[redacted], EASA 787 MRB Chairman
[redacted], TCCA 787 MRB Chairman

FIGURE 5-2. MRBR APPROVAL PAGE

[redacted] MAINTENANCE REVIEW BOARD REPORT

FAA APPROVAL PAGE

This report outlines the initial minimum scheduled maintenance/inspection requirements to be used in the development of an approved continuous airworthiness maintenance program for the airframe, engines, systems, and components of the [redacted] model aircraft.

The requirements in this report have been developed using Maintenance Steering Group (MSG-3) revision 2005.1.

The Federal Aviation Administration (FAA) hereby approves that this report is to be used by U.S. certified air carriers of the [redacted] model aircraft.

Signed _____(on file)_____ Date _____(on file)_____

[redacted]

[redacted] FAA MRB CHAIRPERSON

Federal Aviation Administration

Aircraft Evaluation Group

CHAPTER 6. MRB REPORT REVISIONS, FORMAT, AND CONTENT

6-1. MRB REPORT ANNUAL REVIEW. Because the Maintenance Review Board (MRB) report is intended to be an up-to-date, "living" document, the original equipment manufacturer (OEM)/type certificate holder (TCH), industry steering committee (ISC), and the MRB chairperson should annually conduct a joint MRB Report (MRBR) review to determine any need for a revision. The MRB chairperson should document results of these reviews for inclusion in the MRB historical file.

a. Proposed Changes. If needed, the OEM/TCH, ISC and the MRB will convene to evaluate any proposed changes. Submit all proposed changes with supporting data to the MRB chairperson. Approval or disapproval of the proposed changes will be processed in the same manner as outlined for the MRBR approval/disapproval process.

b. AFS-302 Review. AFS-302 review/concurrence of all revised MRBRs is required when changed text matter of the report affects Federal Aviation Administration (FAA) policy. If there is doubt, where it affects FAA policy, then submit the MRBR for review and concurrence by AFS-302. Technical changes to revised MRBRs do not need to be submitted for AFS-302 concurrence.

c. Multiple Approvals. If more than one regulatory authority approves an MRBR, each approving authority will evaluate proposed changes (as per letter of confirmation) before approval by the FAA. The corresponding regulatory authority will review published revisions to the MRBR for possible changes to an operator's maintenance program.

6-2. TEMPORARY REVISIONS. If temporary revisions (TR) are needed, the OEM/TCH, ISC and the MRB will convene to evaluate any proposed changes. Submit all proposed changes with supporting data to the MRB chairperson. Approval or disapproval of the proposed changes will be processed in the same manner as outlined for the MRBR approval/nonapproval process. Specifically identify and incorporate all TRs during the next MRBR review process.

6-3. RECOMMENDATIONS FOR COMPLETING THE REPORT. Each MRBR should be entitled, "Maintenance Review Board Report (MRB Report) OEM name, aircraft model #," and at a minimum, should contain the following, as appropriate:

a. Title Page. Containing the title of the MRBR and the report number, if any.

b. Table of Contents.

c. Approval Page. Containing the following statements:

(1) "This report outlines the minimum scheduled interval/tasking requirements to be used in the development of an approved maintenance/inspection program for the airframe, engines, systems, and components of the (aircraft make, model, and series)."

(2) "The requirements in the report have been developed using Maintenance Steering Group (MSG) decision logic from the current MSG revision (or alternative procedure as agreed upon by FAA, ISC, or WG)."

(3) "The Federal Aviation Administration (FAA) hereby approves that this report be used by U.S. certificated operators of the (aircraft make, model, and series)." (Insert page for each foreign regulatory authority approval, as applicable) Chapter 5 contains sample approval letters.

d. Record of Revisions.

e. Summary of Changes.

f. List of Effective Pages (including the revision status and corresponding dates).

g. ISC/MRB Personnel Listing (including ISC/MRB personnel, their organizational affiliation, and the capacity in which they serve).

h. The MRBR Preamble. (The following information should be included in the preamble of each MRB report.) "This report outlines the minimum scheduled interval/tasking requirements to be used in the development of an approved maintenance/inspection program for the airframe, engines (on aircraft), systems, components, and appliances, of (aircraft make, model, and series). These MRB report requirements are a basis from which each operator develops its own maintenance/inspection program."

i. Acronyms. Define all acronyms in the MRBR. Appendix 1 contains a list of acronyms in the MRBR.

j. Definitions. Include definitions of technical terms in the MRBR. (Refer to Appendix 2.) Whenever possible, use industry accepted definitions such as those found in the Air Transportation Association ATA latest version of MSG documents and World Airlines Technical Operations Glossary.

k. Applicability. The MRBR must identify the specific aircraft make, model, and series, and the standard options/modifications. New options/modifications as amended by MSG analysis will be added to the MRBR.

l. Analysis of MSIs and SSIs. Analyze all maintenance significant items (MSI) and structural significant items (SSI) on a task-by-task basis without regard for letter checks. If a task is determined to be a safety task or applicable cost effective task, select the appropriate tasking interval.

(1) The MRBR will provide guidance regarding the means to optimize the minimum scheduled interval/tasking requirements to a level higher than that provided as initial requirements in the MRBR. This guidance will be unique to the aircraft model.

(2) Optimization guidance should consider the content of like checks or other related inspections and their repetitive intervals. A determined series or sequence of specified checks or other related inspections must be completed and the resultant data found satisfactory before optimization of that type of check/inspection. Include in this section of the MRBR the description, type of checks/inspections, and their intervals.

m. Maintenance Requirement Rules. Include the following in the MRBR.

(1) The optimization procedures as described in the Policy and Procedure Handbook, the following rules applies: Refer to Chapter 12 for optimization details.

(2) Individual task intervals may be optimized based on satisfactory substantiation by the operator, review and approval by its appropriate regulatory authority, or in accordance with the operator's FAA-approved reliability program.

(3) Task interval parameters expressed in the MRBR may be converted to an individual operator's desired units, provided this conversion does not result in the operator exceeding the initial requirements of the MRBR.

(4) The use of nondestructive inspection (NDI) methods, such as X-ray, ultrasonic, eddy current, and radioisotope, or alternative processes that the manufacturer approves, can provide an alternative to the methods this report prescribes. Each operator should notify its regulatory authority of the use of an acceptable alternative method.

NOTE: Within this report, the terms "check" and "inspection" are not intended to imply a level of skill required to accomplish a task.

(5) Life-limited items must be retired in accordance with the limits established in the engine or aircraft Type Certificate Data Sheets (TCDS) or the Airworthiness Limitations section of the engine or aircraft OEM/TCH Instructions for Continued Airworthiness.

(6) After the accumulation of industry service experience, the ISC or MRB chairpersons may request changes to the requirements of this MRBR that the operator may use after approval of the appropriate regulatory authority.

(7) Failure Effect Category (5 or 8) safety tasks cannot be deleted or escalated without the approval of the MRB Chairman and/or the Aircraft Certification Office (ACO).

n. System/Powerplant Requirement Rules. The FAA recommends the following contents of the system/powerplant requirement rules section of the MRBR.

(1) MSG (Specify the revision) logic was used to develop an on-aircraft minimum scheduled interval/tasking requirement. With the exception of life-limited items, this process does not normally include detailed shop maintenance procedures. Individual operators control off-aircraft detailed procedures; they are in accordance with the OEM/TCH published minimum interval/tasking requirements, which the regulations require.

(2) MSI: The OEM/TCH provides the MSI list in a separate specified document.

(3) Each MSI the OEM/TCH identified has been subjected to MSG analysis. This process has resulted in the identification of maintenance tasks that are contained in this report. Each MSI for which a task was not generated during the analysis is identified as follows: (Provide MSI listing, or other means as specified, for which no tasks were identified.)

(4) SSI. SSIs must not be confused with Principal Structural Elements, (PSE) (Title 14 of the Code of Federal Regulations part 25, § 25.571); however, the SSIs must address all PSEs.

o. Structural Program Rules. The OEM/TCH develops (structural inspection procedure (SIP) requirement rules to meet the inspection requirements for damage tolerance. The types of damage considered during structural requirement development are environmental deterioration (ED) (corrosion, stress corrosion), accidental damage (AD), and fatigue damage (FD). Some forms of ED are age related; therefore, calendar intervals control inspections for this type of deterioration. The required structural requirements section incorporates these calendar inspections, plus the requirements for detecting other types of ED, AD, and FD. The structural requirement rules section of the MRBR recommends the following contents:

(1) All aircraft in an operator's, or group of operator's fleet are subject to the provisions of this report. These requirements include external and internal inspections, structural sampling and age-exploration programs, corrosion prevention and control programs, and additional supplemental structural inspections that may be required for fatigue-related items. Calendar time, flight cycles, or flight hours express the initial check intervals for the SIP. Do not optimize a repeat inspection interval until at least one aircraft in an operator's or group of operator's fleet has been inspected within the initially defined interval listed in the MRBR.

(2) All changes to structural inspection items listed in the Airworthiness Limitations section require FAA engineering approval. Document number in the appropriate appendix will reference structural inspection limitations listed in the aircraft manufacturer's Airworthiness Limitations inspection section in the MRBR.

(3) The Structures Program should include requirements to maintain composite structural details, elements or assemblies whose failure could affect the structural integrity necessary for the safety of the aircraft. These requirements should take into account that composite structures may be damaged by accidental impact or aging deterioration; and those composite structures degrade in a different way compared to metallic structures. Composite structure will be analyzed to create a minimum initial scheduled maintenance/inspection requirements. All structural items will be categorized as either an SSI or Other Structure. (The SSI/PSE list is provided by the OEM/TCH in a separate specified document.)

p. Zonal Program Rules. The Zonal Inspection Program (ZIP) provides for the consolidation of a number of general visual inspection (GVI) tasks for each zone. A zonal inspection may include GVI tasks derived from MSI and SSI. An MSI/SSI task that is in the ZIP must be cross-referenced with supporting documentation and located in the appendix of the MRB as a zonal item. Likewise, the zonal item must be cross-referenced as an MSI/SSI task to ensure content and accountability. Include the following contents of the Zonal Procedure Rules section of the MRBR:

NOTE: Failure Effect Category (5 or 8) safety tasks are not candidates for zonal requirements.

(1) The ZIP contains a series of GVI tasks. Detailed inspection (DET) and special detailed inspection (SDI) are not to be contained in the ZIP. Zonal inspection requirements apply only to zones.

(2) The ZIP contains GVI tasks derived from enhanced zonal analysis procedures (EZAP).

(a) Identify zones that both contain electrical wiring and have potential for combustible material being present. For those zones, perform an enhanced zonal analysis that permits the identification of stand-alone inspection tasks that allow appropriate attention to be given to deterioration of installed wiring and electrical wiring interconnection system (EWIS),

(b) EWIS tasks derived during the EZAP process will be identified as GVI, DET, or Restoration (RST) tasks. The ZIP will not contain stand-alone EWIS tasks. These special dedicated tasks reside in ATA 20 of the Systems/Powerplant section of the MRBR, and do not have a failure effect category.

(c) Uniquely identify all EWIS/EZAP-derived stand-alone tasks GVI, DET, or RST in the EZAP analysis for traceability during future changes. This prevents inadvertent deletion or escalation of an EZAP-derived stand-alone task without proper consideration of the risk basis for the task and its interval. All escalations must go through the appropriate FAA oversight office.

(d) The latest version of the MSG analysis develops all Lightning and High Intensity Radiated Field (L/HIRF) GVI tasks. The ZIP will not contain stand-alone L/HIRF tasks. These special dedicated tasks should reside in a separate section of the MRB. Uniquely identify all L/HIRF tasks.

(3) Access to zones should be easy to accomplish and should not require the use of special tools. Normally, the inspection aids include a flashlight and/or inspection mirror. Inspect the entire visible contents of the zone for obvious damage, security of installation, and general condition including corrosion and leaks. Refer to latest version of MSG document for an accurate definition of GVI.

(4) The following zones do not contain system installations, but receive adequate surveillance from other maintenance or structural inspections tasks. Accordingly, the inspection requirements in the ZIP do not specify these zones. (Insert listing of the zones not specified in the ZIP or in other document as specified.) (Insert aircraft zone diagram sheets or in other document as specified.)

q. Foreign Regulatory Authority National Requirements. A section at the end of the MRBR per each regulatory authority will identify national differences as mandated by foreign regulatory authorities. (Each is accepted by the respective authority).

r. Appendices.

- Identification of aircraft zones.
- Extended Operations requirements.

- All acronyms/abbreviations as used in the MRBR.
- Definitions of specific terms, processes, inspections as identified in MRBR.
- Other, as applicable.

CHAPTER 7. MRB POLICY BOARD

7-1. FAA MAINTENANCE REVIEW BOARD POLICY BOARD (MRBPB).

a. Purpose of the MRBPB. The MRBPB advocates the standardization of Maintenance Review Board (MRB) policy and procedures and provides a structured forum for discussions leading to the development of national and international recommendations regarding all MRB activities. The MRBPB develops Federal Aviation Administration (FAA)/Aircraft Evaluation Group (AEG) positions for standardized guidance on issues that arise from the MRB/Air Transportation Association (ATA) latest version of the Maintenance Steering Group (MSG) process. Continued development of standardized MRB policies, procedures, and guidance promotes harmonization within the respective FAA AEG offices and participating industry groups.

b. Meetings. Membership includes a designee from the Aircraft Maintenance Division, AFS-300, and one designee from each AEG office. The MRBPB normally meets at least twice a year with one meeting just before the International Maintenance Review Board Policy Board (IMRBPB). Additional meetings may be held via electronic media. It is the responsibility of the MRBPB to develop harmonized issue papers, procedures, and guidance. It also produces FAA guidance for issue papers recommended for implementation by the IMRBPB. The MRBPB participates in international meetings on MRB policy issues with other regulatory authorities.

7-2. INTERNATIONAL MAINTENANCE REVIEW BOARD POLICY BOARD.

a. Function of the IMRBPB. IMRBPB is a system for the continuing development of policies, procedures, and guidance for the use of personnel operating under the purview of various MRB. IMRBPB is a process of promoting harmonization with other regulatory authorities throughout the world; the IMRBPB advocates the standardization of MRB policy and procedures. The IMRBPB also provides a structured forum for discussions leading to the development of national and international policy regarding all MRB activities. The ATA and the Maintenance Programs Industry Group under the ATA Airworthiness Committee represent the industry at the IMRBPB meeting. The committee is also open to input from the aviation industry.

b. Composition of the IMRBPB. The IMRBPB convenes once a year. Industry/regulatory discussion are a portion of the meeting. Industry representation should be limited to appropriate representatives dealing with the discussion topics. The meeting venue will normally rotate among the IMRBPB members.

c. IMRBPB Documents. IMRBPB maintains an issue paper list with associated documents such as minutes of meetings, action item list, substantiation documents, and associated IMRBPB policy decisions. The IMRBPB only addresses issues related to the MRB/MSG processes and uses the latest revisions of the following guidance.

- FAA Advisory Circular AC 121-22, Maintenance Review Board Report Maintenance Type Board Procedures, current edition.
- EASA Doc # C.I011-01, Maintenance Review Board Team.
- Transport Canada TP 13850, Scheduled Maintenance Instruction Development Process Manual.

CHAPTER 8. MAINTENANCE TYPE BOARDS PROCESS

8-1. GENERAL. The Maintenance Type Boards (MTB) process permits type certificate (TC) applicants to develop minimum scheduled interval/tasking requirements when air operators are not available to participate in the process. The MTB and Maintenance Review Board (MRB) processes are similar, except with the MTB process there is limited or no operator participation. MTB maintenance instructions are developed using current Air Transportation Association of America (ATA) Maintenance Steering Group (MSG) analytic logic. The minimum scheduled interval/tasking requirements are published as manufacturer recommendations.

8-2. MTB PROCESS APPLICABILITY. The MTB process applies to transport-category aircraft originally type certificated for nine or less passengers and less than 33,000 lb, or helicopters originally type certificated for nine or less passengers and less than 20,000 lb. Original equipment manufacturers (OEM)/type certificate holders (TCH) for these aircraft have the option to use the MRB process.

a. Where United States is the State of Design. Where the Federal Aviation Administration (FAA) is the primary type certification authority, the applicant who is seeking a TC for a new or a derivative aircraft for which this chapter is applicable may develop their scheduled maintenance instructions in accordance with an MTB or request the Aircraft Evaluation Group (AEG) to convene an MRB.

b. Where United States is Not the State of Design. A foreign applicant who is seeking, or intending to seek, an FAA type certificate for a new or a derivative aircraft for which this chapter is applicable, will invite the FAA AEG to discuss the process under which the scheduled maintenance instructions have been or will be developed, and how the FAA might accept that process.

c. Analytic Logic to Use for Scheduled Maintenance Task Development. Use the most current version of the MSG logic when initiating a new MTB. Electrical wiring interconnection system (EWIS)/enhanced zonal analysis procedure (EZAP) analysis may be necessary if applicable by certification rule.

8-3. MTB AUDIT PROCESS.

a. Audit of the Completed Analytical Process. All OEMs/TCHs of type certificated aircraft for which an MTB Report (MTBR) has been developed must maintain records of the analysis performed in a manner such that the FAA may conduct an audit of the complete initial analytic process, and any subsequent analytic processes, that have led to an amendment of the initial MTBR.

b. Validation of the Associated Maintenance Procedures. The OEM/TCH must develop internal instructions and guidelines to enable the validation of all maintenance procedures written to support MTBR tasks and then the OEM/TCH must validate those maintenance procedures. The objective of the validation is to ensure that the procedure can be performed and that the procedure meets the intent of the MTBR task. Where and when requested by FAA, the OEM/TCH must make available a completed aircraft and the necessary qualified maintenance personnel to demonstrate to the FAA that Failure Effect Category 5 and 8 safety tasks, at a

minimum, can be adequately performed and that the procedure meets the intent of the MTBR task. Additional tasks may be validated at FAA's discretion.

8-4. MTB REPORT.

a. General. The MTBR contains the minimum scheduled interval/tasking requirements necessary for a transport-category aircraft. MTBRs are *living* documents that must be reviewed annually to ensure that they reflect the current lessons learned from aircraft operation experience. In this manner, the continuing airworthiness of an aircraft fleet is ensured and only those tasks that are applicable and effective are performed.

b. MTBR Review and Approval. The OEM/TCH applicant is responsible for developing a proposed MTBR and presenting it to the AEG for approval. The MTBR format and content criteria should be aligned with the criteria used for the Maintenance Review Board report, as found in Chapter 6. Once approved, the OEM/TCH holder publishes the MTBR as part of the aircraft's instructions for continued airworthiness (ICA). It is a means of complying in part with the maintenance instruction requirements of Appendix H of Title 14 of the Code of Federal Regulations (14 CFR) part 25, and Appendix A of 14 CFR part 29 as required by part 25, § 25.1529 and part 29, § 29.1529. The AEG must approve the MTBR, as well as subsequent changes, before it becomes available for use by U.S. operators.

NOTE: MTBR tasks will be identified as such in the ICA and can only be changed through the MTB process.

c. Disapproval of Proposed MTB Reports or MTBR Revisions. The MTB chairperson will notify the OEM/TCH in writing of the disapproval of the MTBR or of any subsequent revision. The letter will include the specific reason(s) for the disapproval.

d. Publication of the MTBR. When an MTBR has been produced, the OEM/TCH will publish it as part of the ICA for the aircraft.

e. MTBR Annual Review.

(1) The MTBR is intended to be an up-to-date document, and as a consequence, the OEM/TCH and the MTB chairperson should conduct a joint review, at least annually, to determine the need for revisions. Results of these reviews are to be documented by the MTB chairperson for inclusion in the MTB historical file.

(2) The OEM/TCH and the MTB will convene and evaluate proposed changes to the MTBR. Proposed changes and their supporting data are submitted to the MTB chairperson. Approval or disapproval of the proposed changes must be processed in the same manner as outlined for the initial MTBR approval/disapproval. Any changes to the MTBR must follow the optimization process in Chapter 12.

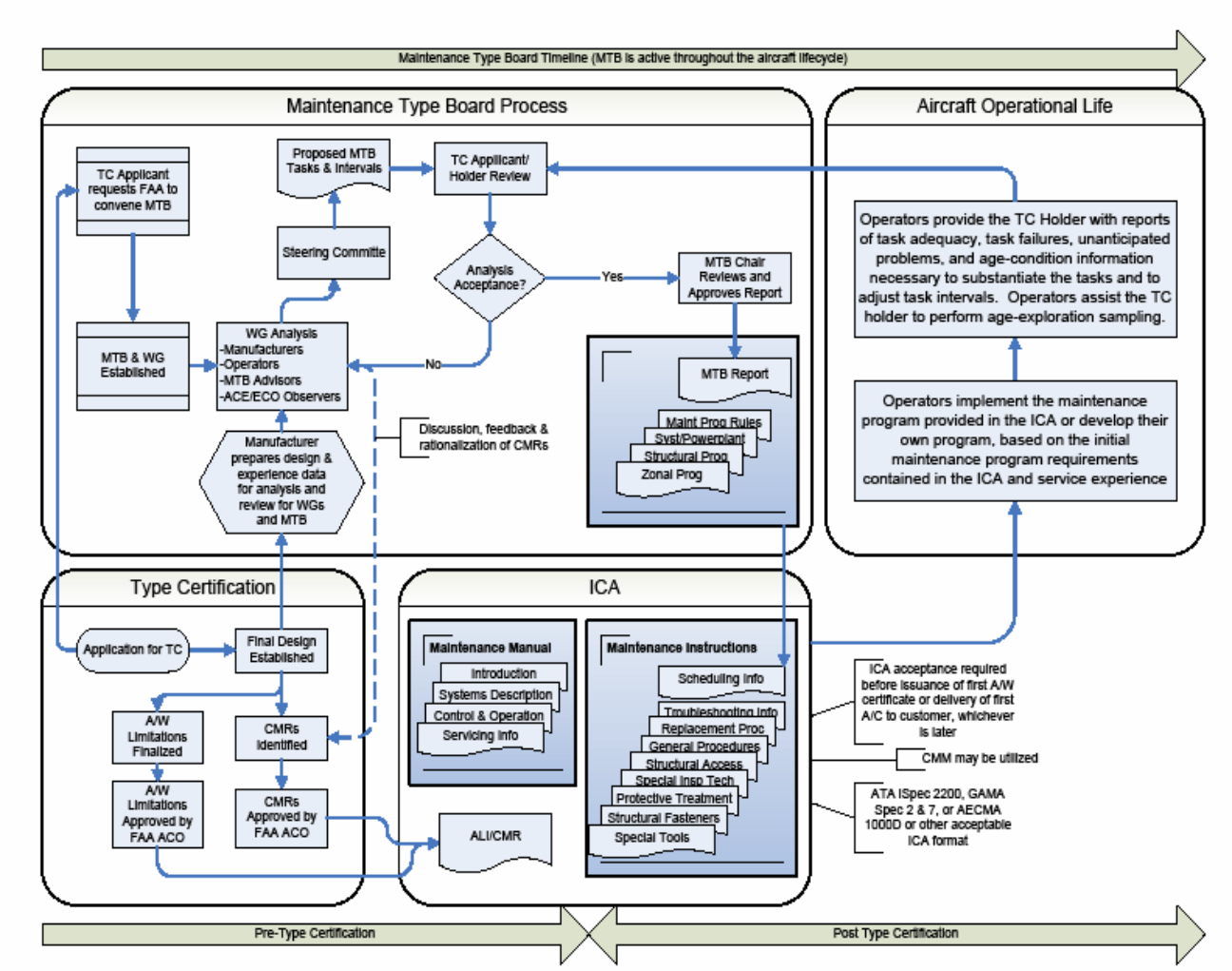
8-5. POLICY AND PROCEDURES HANDBOOK.

a. General. The OEM/TCH must develop an internal policy and procedures document or handbook for the purpose of managing the MTB process. The FAA recommends that the format

and content of the Policy and Procedure Handbook (PPH) outline be adopted for the MTB process (refer to Appendix 3). Present a copy of the PPH to the MTB chairperson for AEG review and acceptance before beginning any task development work. All participants in the MTB process are to use the PPH as the standard to conduct the MTB process. Regulatory authority and industry experience have indicated that the following information is expected in each PPH for the successful latest version of MSG process and development of a MRBR:

b. Process Flowchart. A process flowchart describing the MTBR scheduled maintenance task development and minimum interval/tasking requirements process and its relationship to the development of ICAs is below.

FIGURE 8-1. MAINTENANCE TYPE BOARD FLOWCHART



8-6. OEM/TCH REPRESENTATIVES. Representatives of the OEM/TCH who are engaged in performing the analysis for an MTB process must meet the following criteria.

a. Experience. Representatives must have relevant maintenance engineering experience on an equivalent aircraft type, system, or component.

b. Training. Representatives must have undergone training in the analytic logic process to be used.

8-7. REGULATORY AUTHORITIES RESPONSIBILITY. When the OEM/TCH formally notifies the AEG of the intention to develop an MTB proposal, the AEG manager will assign a qualified person as MTB chairperson to establish and manage the MTB. The MTB chairperson selects MTB members/working group (WG) advisors.

a. MTB Chairperson. The MTB chairperson is responsible to perform the following functions:

(1) Determine the number and type of FAA personnel that are necessary, and then organize them into an MTB.

(2) Provide the OEM/TCH with the names of FAA/AEG MTB personnel, their affiliations, assignments, and changes as they occur.

(3) Establish and maintain a file of all MTB proceedings for the MTB historical file.

(4) Establish the extent of regulatory authority participation and assignment of WG advisors.

(5) Ensure that the OEM/TCH provides the necessary technical and analytical logic training to MTB members/WG advisors.

(6) Attend steering committee (SC) meetings.

(7) Offer advice to the SC and the WGs.

(8) Provide oversight of the TCH/OEM validation of the Associated Maintenance Procedures.

(9) Review reports from previous SC meetings (if applicable) and from the WG members.

(10) Approve the MTBR, and revisions.

b. MTB Members. MTB members are expected to meet or have the equivalent experience and training this chapter requires. In addition, the MTB members are expected to perform the following functions:

(1) Attend WG meetings and provide guidance to the WG members.

(2) Review WG meeting minutes and provide progress reports to the MTB chairperson before the next scheduled SC meeting. This review will contain an assessment of WG activities, including a notification of any controversy or potential problem areas.

(3) Attend SC meetings, as invited by the MTB chairperson, in coordination with the OEM/TCH.

(4) Attend MTB meetings.

(5) Provide oversight of the TCH/OEM validation of the Associated Maintenance Procedures.

c. Experience and Training Requisites. MTB members must meet the following levels:

(1) Experience:

(a) Valid FAA aircraft mechanic certificate, or

(b) Practical experience and theoretical training that is equivalent, or

(c) Practical training and experience on an equivalent aircraft type or system, or

(d) Practical industry experience as an aircraft maintenance inspector.

(2) Training:

(a) Aircraft-specific training.

(b) MSG training.

CHAPTER 9. OEM TCH RECOMMENDED MAINTENANCE PROCESS

9-1. GENERAL. Original equipment manufacturers (OEM)/type certificate holders (TCH) of airplanes that are less than 12,500 lb, or helicopters that are to be type certificated (TC) in the normal category less than 7,000 lb may develop their scheduled interval/tasking requirements in accordance with the OEM/TCH internal processes. The OEM/TCH must meet the requirements of Federal Aviation Administration (FAA) Order 8110.54, Instructions for Continued Airworthiness: Responsibilities, Requirements, and Contents, current edition, in addition to the criteria below. OEMs/TCHs for these aircraft have the option to use the Maintenance Type Board process or Maintenance Review Board (MRB) process.

9-2. RECOMMENDED MAINTENANCE PROCESS APPLICABILITY.

a. United States is the State of Design. The FAA is the primary type certification authority, the OEM/TCH who is applying for a TC for a new or a derivative aircraft for which this chapter is applicable may develop its scheduled maintenance instructions in accordance with a recommended maintenance process.

b. United States is *Not* the State of Design. A foreign applicant who is applying for an FAA TC for a new or a derivative aircraft for which this chapter is applicable, will invite the FAA Aircraft Evaluation Group (AEG) to discuss the process under which the scheduled maintenance instructions will be developed, and how the FAA may accept that process.

9-3. RECOMMENDED MAINTENANCE PROCESS AUDITS.

a. Audit of the Completed Analytical Process. All OEM/TCH must maintain records of the analysis to develop their scheduled maintenance instructions. OEMs/TCHs must keep the records in such a manner that the FAA may readily audit the analytic process and any subsequent analytic processes that may lead to an amendment of the minimum scheduled interval/tasking requirements.

b. Validation of the Associated Maintenance Procedures. The OEM/TCH must develop internal instructions and guidelines to enable the validation of all maintenance procedures written to support scheduled maintenance tasks; the OEM/TCH must then validate those maintenance procedures. The objective of the validation is to ensure that it is possible to perform the procedure and that the procedure meets the intent of the scheduled maintenance instruction. Where and when requested by FAA, the OEM/TCH must make available a completed aircraft and the necessary qualified maintenance personnel to demonstrate to the FAA that any particular maintenance procedure can be adequately performed, and that the procedure meets the intent of the scheduled maintenance task.

9-4. SCHEDULED MAINTENANCE INSTRUCTION.

a. Scheduled Maintenance Instruction Review and Approval. The instructions for continued airworthiness (ICA), as published by the OEM/TCH, must contain a statement for the scheduled maintenance instruction development that states that the scheduled maintenance instructions and their associated procedures have been reviewed and approved for use by operators, and identify any limitations applicable when implementing the instructions.

b. Scheduled Maintenance Instruction Publications. The OEM/TCH must publish the scheduled maintenance instructions as part of the aircrafts ICA. It is the responsibility of the OEM/TCH to issue amendments to the ICA as required.

c. Scheduled Maintenance Instruction Development as a Living Document. Before FAA acceptance of the scheduled maintenance instructions as part of the aircraft's OEM/TCH process, the OEM/TCH must develop an auditable system for continuing analysis of all tasks included within the maintenance instructions. As part of the continuing analysis system, the OEM/TCH should address the following:

(1) A system for acquiring from operators reports related to adequacy of task, failures, failure frequencies, and the consequence of the failure.

(2) An age-exploration system for the continuous evaluation of age–condition information for the substantiation of current task intervals and for the adjustment of task intervals.

(3) A system for controlling the addition of new scheduled tasks, to ensure that they are applicable and effective.

(4) A system for the periodic evaluation of all tasks in the program to eliminate those that are no longer applicable and effective.

(5) A system for evaluating unanticipated problems and determining the appropriate action.

CHAPTER 10. MRBR/MTBR LOW UTILIZATION MAINTENANCE REQUIREMENTS

10-1. GENERAL. A logic process is necessary to ensure minimum scheduled interval/tasking requirements are met for low utilization aircraft. This will ensure early detection of deterioration in areas that are sensitive to time rather than cycles or flight hours.

10-2. APPLICABILITY. These requirements apply to aircraft that have a Maintenance Review Board Report (MRBR) and Maintenance Type Board Report (MTBR) or have been analyzed under the Maintenance Steering Group (MSG) to define the minimum scheduled interval/tasking requirements.

10-3. REQUIREMENTS. The OEM/TCH should specify low-utilization parameters in its Policy and Procedure Handbook/MRBR/MTBR. The intervals for tasks identified in the MRBR/MTBR are based on normal utilization. Operators deviating substantially below normal type utilization should consider the application and employment of a low-utilization program based on calendar time. Tasking requirements will be addressed on a task-by-task basis to ensure the proper utilization parameter.

a. When the aircraft has been analyzed using MSG logic, it is not necessary to revisit the analysis before applying the proper low-utilization parameter for a task.

b. The OEM/TCH is responsible to develop a low-utilization program. This is a stand-alone program, and not a supplement to the MRBR/MTBR.

CHAPTER 11. FLIGHTCREWS ACCOMPLISHING MAINTENANCE

11-1. GENERAL. This section addresses flightcrew performing maintenance tasks. Title 14 of the Code of Federal Regulations (14 CFR) defines people authorized to accomplish maintenance. Flight crews cannot take credit for any Maintenance Review Board Report/Maintenance Type Board Report tasks.

11-2. APPLICABILITY. Inspections are considered maintenance. This is based on 14 CFR part 43, § 43.7(f), which states: "A person holding at least a private pilot certificate may approve an aircraft for return to service after performing preventive maintenance under the provisions of § 43.3(g)." Flightcrews are not permitted to accomplish any maintenance accomplished outside the scope of preventive maintenance as defined in part 43 Appendix A(c). Commercial operations under 14 CFR part 119 are not allowed to accomplish maintenance/preventive maintenance tasks without an exemption to perform those tasks. The only exception to this is rotorcraft under part 43, § 43.3(h).

CHAPTER 12. IMPLEMENTATION AND OPTIMIZATION OF TASKING INTERVALS

12-1. INTRODUCTION. The guidance in this document is intended for use by original equipment manufacturer(OEM)/type certificate holder (TCH) and Maintenance Review Board (MRB)/Industry Steering Committee (ISC) members who are involved with the evolution/optimization or deletion/addition of tasks in an initial/current MRB Report (MRBR). Apply this guidance for evolution/optimization or deletion/addition activities where no official correspondence has been forwarded to the airworthiness authorities, or for activities to be finalized (MRBR proposal submittal) after April 2009. The following is guidance for developing and assessing proposals to the MRBR.

a. The initial MRBR for any new aircraft is developed in the absence of actual in-service experience. As a result, the tendency is to be conservative in the decisionmaking process. As service experience is accumulated, task intervals (thresholds/repeats) should be adjusted to reflect the results of actual in-service data.

b. The OEM/TCH evolution/optimization process does not assume any operational control over an operator's maintenance program.

NOTE: When intervals are stated in this document it includes both threshold and repeat values.

NOTE: If this chapter is not followed, the OEM/TCH will be limited to no more than 10 percent escalation with approved data. Further escalation is not allowed until a task is repeated and sufficient data are available.

12-2. PURPOSE. While this guidance is not exhaustive, use it as the basis for a Policy and Procedures Handbook (PPH) procedure when the OEM/TCH, MRB, and Industry Steering Committee (ISC) wish to proceed with evolution/optimization regarding the MRBR process. Evolution/optimization or deletion/addition of a task through the management of data is a means to assure the continued applicability and effectiveness of the task, while simultaneously improving the integrity of the MRB process. This policy allows the OEM/TCH to develop and use a process that serves as a continuous analysis and evolution/optimization or deletion/addition for the MRBR. It is based on performance data and experience for model-specific fleets flown by multiple operators under a variety of operating conditions and environments.

12-3. POLICY DESCRIPTION. The OEM/TCH must meet the policy requirements defined by the regulatory authorities of the country of origin; and will define further details and procedure clarifications in the PPH. As the PPH is a living document, a response must be given within 60 days after ISC acceptance/OEM submission. The following should occur:

a. The MRB/ISC must coordinate and approve PPH revisions, where applicable.

b. Evaluate in-service data, both scheduled and unscheduled maintenance findings related to the intent of the Maintenance Steering Group (MSG) task.

c. Weigh the relevance and significance of findings.

d. Standardize data format and content (ATA SPEC 2000 Chapter 11 or equivalent).

e. Ensure data quality, integrity, completeness, and clarity.

f. Consider each task individually.

g. Review original design and engineering specs, as required.

h. Review all information related to continue airworthiness (Airworthiness Directives, Service Bulletins, in-service reports/letters, modifications/repairs, etc.).

i. Base MRBR task evolution/optimization or deletion/addition on worldwide representative samples that span the operating environment and age groupings of the aircraft.

j. Base interval evolution/optimization or deletion/addition on risk management. Risk management is the systematic application of management policies, procedures, and practices to the tasks of identifying, analyzing, evaluating, treating, and monitoring risk.

k. Use safety management principles at the OEM level. Safety management is the application of engineering and management principles, criteria and techniques to optimize safety. It is an integrated and comprehensive engineering effort.

l. Apply statistical models to support the evolution/optimization or deletion/addition exercise. In a data-driven statistical decisionmaking process, data size is determined based on the level of confidence. Confidence level refers to the likelihood that the overall fleet performance lies within the range specified by the sample fleet performance. The confidence level is usually expressed as a percentage. For example, a 95 percent confidence level implies that the probability that the fleet parameter lies within the confidence interval is 0.95. For a given confidence level, data size may vary depending on the fleet size and variability of in-service data.

m. The OEM/TCH will collect sufficient data that would support the expected confidence level. However, engineering judgment will remain a part of the evaluation. Statistical analysis should be supported and validated by engineering judgment.

n. Measure task effectiveness should be measured and demonstrated, that is, the ability to:

- Detect and prevent defects before loss of function/structural integrity.
- Mitigate risk of exposure to hidden defects.

o. Record and respond to operators' and regulators' feedback.

p. Ensure the effectiveness and integrity of the process by: 1) collecting in-service data in an ATA SPEC 2000 Chapter 11 format or equivalent, 2) analyzing it, and 3) comparing the results with existing MRBR task requirements.

q. This policy allows for evolution/optimization or deletion/addition of MRBR, scheduled maintenance tasks, intervals, and enhances the use of reliability-driven maintenance analysis processes.

r. Adjust the MRBR based on performance data and analysis processes. However, operator reliability programs should continue to ensure continuous evolution/optimization of their maintenance programs.

s. The OEM/TCH evolution/optimization process does not assume any operational control over an operator's maintenance program.

12-4. RESPONSIBILITIES. The OEM/TCH applicant must notify the approving authorities in writing of their intent to begin an evolution/optimization or deletion/addition process. This will be in the form of an official correspondence as defined by the approving authorities.

> **NOTE: Approving authorities are those authorities that approve the MRBR. The approving authorities will respond, in writing, to the OEM/TCH of their intent to participate in the evolution/optimization or deletion/addition exercise for a given fleet or model.**

a. OEM/TCH (PPH Amendment and ISC/MRB Acceptance/Approval). The OEM/TCH will include within the PPH the policy requirements and criteria as contained within this document. The OEM/TCH will further define the details and procedural actions necessary to conduct the evolution/optimization or deletion/addition exercise. The MRB/ISC will coordinate and approve this plan. Where documents that support the evolution/optimization or deletion/addition are incorporated by reference within the PPH, the current document number and revision number must be stated.

b. OEM/TCH Data Collection. The OEM/TCH system must include a data quality, data integrity, data quantity, audit system, and historical data tool as defined in the next steps.

c. Data Format. The OEM/TCH will use in-service data in a standardized format (ATA SPEC 2000 Chapter 11 format, or equivalent), as deemed acceptable by the regulatory authority, to ensure data quality and integrity. ATA SPEC 2000 Chapter 11 is an industry-sanctioned maintenance reliability data communication format. In order to use this format, operators would have to transition to this type of format, or the OEM/TCH would have to convert the operator data into this standardized format.

d. Regulatory Authorities. It is incumbent on the OEM/TCH to demonstrate to the regulatory authorities compliance with these guidelines for all and any evolution/optimization or deletion/addition MRB task adjustment.

12-5. DATA QUALITY. The OEM/TCH should have a system in place that allows for the collection of data found during operator's task accomplishment to be delivered to the OEM/TCH and then entered in a standardized format into their data collection system. The data collected and used by the OEM/TCH regarding evolution/optimization will include the following information:

a. Aircraft Age. Aircraft age (since delivery) is measured in calendar days, flight hours, or flight cycles, as applicable. MRB task evolution will be based on in-service data collected from a representative sample of older and newer aircraft incorporating more current production standards and modifications. Fleet age representation will be summarized in the analysis report.

b. Geographical or Operational Environment Representation. MRB task interval adjustments will be based on in-service data collected from a representative sample that spans all operating environments. The data will be in proportion to the specific model fleet size of each geographical area; however, it is not necessary to sample all geographical regions, nor is it required to collect data from all extreme operating conditions (e.g., extremely hot and sandy (desert), extremely cold (arctic). A brief summary of the operating environments of the sampled aircraft will be provided in the report.

c. Number of Tasks Accomplished. The number of times the task has been accomplished including "nil/no findings" will be captured and used in the evaluation. Participating operators should provide task findings and nonroutine write-ups for the related tasks of the sample fleet for the evolution/optimization or deletion/addition exercise reporting period.

d. Interval of Tasks findings Applied. Actual task interval of each participating operator will be captured and evaluated.

> **NOTE: The actual intervals may vary between operators and may be different from MRBR requirement. The impact of these variations will be assessed and accounted.**

e. Component Data (Shop Findings, No-Fault-Found Removals and Failures). Information regarding component removal and replacement activity and vendor repair documents should be evaluated, as applicable, where available. This information provides the data necessary to perform component failure-mode and life-cycle analysis which is necessary to support the evolution/optimization or deletion/addition of the tasks associated with the component.

f. Correct Mapping to the MRBR Task. Nonroutine write-ups and in-service findings should be linked to appropriate MRBR tasks, as applicable. Only findings related to the MSG-3 task intent are relevant.

g. Failure Effect Category Considerations. MRBR task interval optimization is based on principles that reflect the criticality of airplane systems components identified during MSG analysis. Account for Failure Effect Categories during the analysis.

h. Operational Representation Flight Hour vs. Cycles, Calendar Time. Aircraft utilization (flight-hours or cycles, as applicable) should be captured and evaluated. Include a summary of fleet-wide service experience, high-time aircraft (hours, cycles, years), time in service, daily utilization (high, low, average), etc in the analysis report.

i. Consecutive Tasking Requirements. To the extent possible, capture consecutive task check data to assess reliability of aircraft systems, components, or structural elements related to the MRBR task.

NOTE: This requirement may be applied to lower interval tasks. Consecutive check data can be impractical for higher interval tasks.

j. Unscheduled Maintenance Findings. Mechanical irregularities and the resulting corrective actions captured from pilot reports and maintenance reports should be reviewed, as applicable. Unscheduled maintenance is a prime indicator of the effectiveness of the scheduled maintenance program.

k. Scheduled Maintenance Findings.

(1) Routine Maintenance Tasks That Generate No Findings. Tasks that generate no findings are as important as tasks that generate findings in determining failure-mode and life-cycle analysis.

(2) Routine Maintenance Tasks That Generate Nonroutine Cards. These findings, which require corrective action, involve structures, area/zonal, and aircraft systems categorized by ATA chapter.

l. Unrelated Significant Findings, If Applicable. Operators should capture significant nonroutine write-ups generated in the course of an unrelated maintenance task, if applicable. These findings, which require corrective action, may not correlate to a routine maintenance task.

m. Four-Digit ATA Code, If Available. To the extent possible, operators should provide four-digit ATA code for scheduled/unscheduled maintenance write-ups to facilitate transfer of findings to appropriate MRBR tasks.

n. Serial Number of Aircraft. The operator should provide an aircraft manufacturer serial number that uniquely identifies each aircraft in the sample fleet.

12-6. DATA INTEGRITY. Data integrity is the quality of correctness, completeness, and compliance with the intention of the creators of the data. It is the condition in which data are identically maintained during any operation, such as transfer, storage, and retrieval. Data integrity is achieved by preventing accidental or deliberate, but unauthorized insertion, modification, or destruction of data in a database.

a. Data Validation. OEM/TCH must have a data validation process that does the following:

(1) Verifies that operator data are converted to ATA SPEC 2000 Chapter 11 or equivalent standard format.

(2) Ensures that all required data elements and attributes are satisfied for submitted data.

b. Audit System. The audit system must ensure that all data be traceable to the original task.

12-7. DATA REVIEW.

a. Analysis Schedule—Evolution/Optimization or Deletion/Addition Timeline. MRB task interval adjustments should be considered after sufficient service experience is accumulated since entry into service. Subsequent task interval adjustments should be considered after additional service experience has been accumulated since the last interval adjustment. In both cases, data sufficiency is measured by the level of confidence as stipulated in these guidelines.

b. Statistical Analysis. The OEM/TCH will develop and implement a statistical analysis system to provide justification that a 95 percent confidence level has been achieved for the evolution/optimization or deletion/addition exercise on a task-by-task basis. Exceptions can be presented and may be approved at the discretion of the approving airworthiness authorities.

c. Engineering Analysis. Engineering analysis will verify that findings are relevant to the scheduled task under evaluation. Nonroutine write-ups will be evaluated to determine the significance or severity of findings. Pilot reports and component reliability reports will also be examined to account for line maintenance activities that may be relevant to the task under evaluation. The severity of the findings must be considered and evaluated.

> **NOTE: Scheduled servicing (e.g., lubrication/oil replenishment) task data do not result in reported related findings, therefore, engineering assessment must be conducted to support an evolution/optimization or deletion/addition. Negative long-term effects (e.g., corrosion) resulting from inappropriate servicing intervals must be considered.**

d. Modification Status, Airworthiness Directives, Service Bulletins, Service Letters, etc. Review all information related to the task (Service Bulletins, Airworthiness Directives, service letters, and other in-service reports/resolutions, as applicable). Also, assess fleet configuration.

e. Internal Review. The OEM/TCH will develop and implement internal quality procedures to review and validate MRBR revision process as defined in the PPH. OEM/TCH will develop and implement internal processes to validate MRBR revised tasks and/or intervals resulting from evolution, or demonstrate that an equivalent written internal process already exists to reach the same intent (not required before April 2010).

12-8. DATA CORRELATION. Correlate mean time between unscheduled removal, mean time between failures, pilot reports, nonroutines, technical followup on open technical issue, and all other pertinent data, as applicable.

a. Working Group Activity (WG)—Interval Recommendation to the ISC (e.g., increase, decrease, remain the same, introduction of new task, or task deletion).

(1) MRB task intervals can be escalated based on the results of in-service experience. In addition, tasks should be de-escalated when in-service data support interval reductions. A task may also be deleted when it is determined that it is ineffective, or the failure mode for which the task was selected never developed due to effective design provisions.

(2) Task deletion, addition, or modification of intent requires new/revised/amended MSG-3 analysis. However, complete reanalysis of the MSG package is not required. Any decision together with justification will be recorded and traceable in the associated MSG-3 analysis. Applicable and effective criteria as specified in MSG will be observed.

(3) The intervals of potential failure finding tasks (i.e., those looking for degradation) should be less than the shortest likely interval between the point at which a potential failure becomes detectable and the point at which it degrades into a functional failure. If the specific failure data are available, this interval may be referred to as the "P to F" interval. Assess consecutive task accomplishments to show that failures are not occurring before the new initial interval.

(4) Interval determination should be validated with a maintenance engineering analysis based on consideration of all the items listed in the quality and quantity of data. The process will be referred or mentioned in the PPH for ISC and regulatory acceptance.

b. ISC Review Acceptance of MRBRP. The ISC will ensure all PPH guidance has been followed and applied. The MRB will ensure all PPH guidance has been followed and applied. The MRBR is released.

CHAPTER 13. STATISTICAL ANALYSIS TASKING OPTIMIZATION

13-1. GENERAL. Statistical Analysis Tasking Optimization (SATO) is a term to describe an original equipment manufacturer (OEM)/type certificate holder (TCH) customized program for optimization of scheduled maintenance. It is data driven, combining data for model-specific fleets from multiple operators that use the type of aircraft under a variety of operating conditions and environments. Its intention is to use a larger fleet sampling data to optimize tasking intervals in operators' maintenance programs. SATO is not intended to replace an operator's Reliability Program (if applicable). Its use by operators will be voluntary. OEMs/TCHs that wish to offer SATO programs must design a framework for its operation. The OEM/TCH will work with the appropriate Aircraft Evaluation Group (AEG) to evaluate the program at the Maintenance Review Board (MRB) level.

13-2. APPLICABILITY. An OEM/TCH SATO program should contain these minimum elements:

a. A delivery system of data from the operator to the OEM in an ATA SPEC 2200 format (or equivalent).

b. An in-service data program to catalog the data into a useable form.

c. An aircraft reliability management database. The OEM/TCH must have a quality assurance system that ensures the data are clean and valid before accomplishing the engineering analysis.

d. A statistical model that will optimize the data.

13-3. OPERATOR PARTICIPATION.

a. Prerequisites for Participation. If an operator wishes to participate in an OEM/TCH SATO program, the OEM/TCH will have to accept it. This means the operator must meet the OEM/TCH prerequisites that may include supplying specific historical data about their fleet in a format acceptable to the OEM/TCH program. Complete (from birth) data would be the best; however, that will not always be possible. The OEM/TCH program will set a baseline of minimum data.

b. Maintenance Planning Document (MPD). Data will be combined with other participant operators' data to "optimize" the MPD by including a larger sample of data. The AEG chairperson or the designee for the affected aircraft will review the OEM/TCH recommendation for an optimized task and resolve any issues. The principal inspectors (PI) who have operators with affected aircraft will have an opportunity to comment on the proposed optimized task before final consideration. When satisfied with the technical merits, the AEG will send the OEM/TCH recommendation to AFS-302 for policy review and final concurrence. The OEM/TCH will then distribute the accepted recommendation to all participating operators. Only operators participating in the SATO program will be allowed to use the optimized MPD. The participating operators would then incorporate the new revised MPD task into their maintenance program and submit the revision to the PI.

APPENDIX 1. ACRONYM/ABBREVIATION LISTING FOR THE MRB REPORT

The following is a recommended listing of acronyms and abbreviations that may be contained in each MRB Report.

AC	Advisory Circular
ACO	Aircraft Certification Office
AD	Accidental Damage/Airworthiness Directive
ADR	Accidental Damage Rating
AEG	Aircraft Evaluation Groups
AEG-BOS	Boston-AEG, Engines, Propellers
AEG-DFW	Dallas Ft. Worth-AEG, Rotorcraft
AEG-LGB	Long Beach-AEG, Transport Aircraft
AEG-MKC	Kansas City-AEG, Small Airplane
AEG-SEA	Seattle-AEG, Transport Aircraft
AFS	Flight Standards Services
AEP	Age Exploration Program
AFRP	Aramid Fiber Reinforced Plastic
ALI	Airworthiness Limitations
AMM	Aircraft Maintenance Manual
AMOC	Alternate Means of Compliance
ATA	Air Transport Association of America, Inc.
CAM	Canadian Airworthiness Manual
CAA	Civil Airworthiness Authority
CFR	Code of Federal Regulations
CFRP	Carbon Fiber Reinforced Plastic
CMCC	Certification Maintenance Coordination Committee
CMM	Component Maintenance Manual
CMO	Certificate Management Office
CMR	Certification Maintenance Requirement
CP	Corrosion Program
CPCP	Corrosion Prevention and Control Program
DAH	Design Authority Holder
DET	Detailed Inspection
DIS	Discard
DSO	Design Service Objective
DTA	Design Tolerance Assessment
DTR	Damage Tolerance Rating
DVI	Detailed Visual Inspection
DY	Daily
EASA	European Aviation Safety Agency
EAPAS	Enhanced Airworthiness Program for Airplane Systems
ECO	Engine Certification Office
ED	Environmental Deterioration

EDR	Environmental Deterioration Rating
EICAS	Engine Indicating and Crew Alerting System
EROPS	Extended Range Operations
ETOPS	Extended Two Engine Operations
EWIS	Electrical Wiring Interconnection System
EZAP	Enhanced Zonal Analysis Procedure
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FC	Functional Check
FCK	Functional Check
FD	Fatigue Damage
FEC	Failure Effect Category
FH	Flight Hours
FLT	Flight
FMEA	Failure Mode and Effects Analysis
FOEB	Flight Operations Evaluation Board
FSDO	Flight Standards District Office
FTS	Fuel Tank Safety
GFRP	Glass Fiber Reinforced Plastic
GV	General Visual
GVI	General Visual Inspection
HIRF	High Intensity Radiated Fields
ICA	Instructions for Continuing Airworthiness
ICAO	International Civil Aviation Organization
IP	Issue Paper
ISC	Industry Steering Committee
IMRBPB	International Maintenance Review Board Policy Board
JAA	Joint Aviation Authorities
JAR	Joint Airworthiness Requirement
JOEB	Joint Operations Evaluation Board
L/HIRF	Lightning/High Intensity Radiated Field
LU	Lubrication Task
MEA	Maintenance Engineering Analysis
MMEL	Master Minimum Equipment List
MFG	Manufacturer
MEL	Minimum Equipment List
MTB	Maintenance Type Board Process
MTBR	Maintenance Type Board Process Report
MPD	Maintenance Planning Data Document
MPIG	Maintenance Program Industry Group
MPP	Maintenance Program Proposal
MRB	Maintenance Review Board
MRBPB	Maintenance Review Board Policy Board
MRB Report	Maintenance Review Board Report

MSC	Maintenance Steering Committee
MSG-1	Maintenance Steering Group - 1st Task Force
MSG-2	Maintenance Steering Group - 2nd Task Force
MSG-3	Maintenance Steering Group - 3rd Task Force
MSI	Maintenance Significant Item
MTBF	Mean Time Between Failure
MTBUR	Mean Time Between Unscheduled Removal
MWG	Maintenance Working Group
NDI	Non-destructive Inspection
NDT	Non-destructive Test
OEM	Original Equipment Manufacturer
OPC	Operational Check
PI	Principal Inspector
PMMEL	Proposed Master Minimum Equipment List
PPH	Policy and Procedures Handbook
PSE	Principal Structural Element
R/I	Remove and Install
RF	Radiated Frequency
RMP	Recommended Maintenance Process (RMP)
RS	Restoration Task
RST	Restoration
SATO	Statistical Analysis Tasking Optimization
SDI	Special Detailed Inspection
SID	Supplemental Inspection Document
SFAR	Special Federal Aviation Regulation
SIP	Structural Inspection Procedure
SSA	System Safety Assessment
SSI	Structural Significant Item
SSID	Supplemental Structural Inspection Document
SVC	Service Task
STWG	Structures Working Group
SWG	Structures Working Group
TCH	Type Certificate Holder
TBD	To Be Determined
TCDS	Type Certificate Data Sheet
UV	Ultra-Violet
VC	Visual Check Task
VCK	Visual Check
WG	Work Group
ZA	Zonal Analysis
ZIP	Zonal Inspection Program
ZLWG	Zonal Working Group
ZWG	Zonal Working Group

APPENDIX 2. IP 44 DEFINITIONS

a. Confidence Level. The likelihood that the overall fleet performance lies within the range specified by the sample fleet performance. The confidence level is usually expressed as a percentage.

b. Nonroutine Task. A task is nonroutine when it is not a planned/scheduled task coming from the operator's/manufacturer's maintenance program.

c. Nonmetallics. Any structural material made from fibrous or laminated components bonded together by a medium. Materials such as graphite epoxy, boron epoxy, fiberglass, kevlar epoxy, acrylics and the like are nonmetallics. Nonmetallics include adhesives used to join other metallic or nonmetallic structural materials.

d. Line Maintenance. Routine check, inspection and malfunction rectification performed en-route and at base stations during transit, turn-around or night stop.

e. Pilot Report (also known as PIREP). Suspected or known malfunctions, or unsatisfactory conditions that are entered by the flightcrew into the aircraft log and require maintenance action.

f. Qualified FAA MRB Chairperson. An Airworthiness inspector with working knowledge of the Maintenance Review Board (MRB) process must have system/structures training on particular aircraft and have MSG formal training.

g. Unscheduled Maintenance. Maintenance performed to restore an item to a satisfactory condition by providing correction of a known or suspected malfunction and/or defect.

h. Evolution/Optimization. Task through the management of data is a means to assure the continued applicability and effectiveness of the task while improving the integrity of the process.

i. Risk Management. The systematic application of management policies, procedures, and practices to the tasks of identifying, analyzing, evaluating, treating and monitoring risk.

j. Safety Management. The application of engineering and management principles, criteria and techniques to optimize safety. It is an integrated and comprehensive engineering effort.

k. Structural Significant Items (SSI). Any detail, element, or assembly that contributes significantly to carrying flight, ground, pressure or control loads, and whose failure could affect the structural integrity necessary for the safety of the aircraft.

APPENDIX 3. POLICIES AND PROCEDURES HANDBOOK FORMAT

This appendix intends to provide standardized and harmonized policy in the development of a proper policy and procedures handbook (PPH). It is encouraged that all industry applicant's PPH documents be developed containing the same basic data and information, as applicable, to provide for a complete, consistent, and quality process.

Regulatory authority and industry experience has indicated that the following information is expected in each PPH, as applicable, for the successful latest version of the Maintenance Steering Group process and development of a Maintenance Review Board Report:

SCHEDULED MAINTENANCE DEVELOPMENT

Contents of PPH

I Approval & Acceptance Letters or Signature Page

II Record of Revisions

III List of Effective Pages

IV History of Changes

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3.2.3 The Systems Functional Description (SDF) Form

3.2.4 Component Supplier & Maintainability and Reliability Data (MDR) Form

3.2.5 Design Features

3.2.6 The Functional Failure Analysis (FFA) Form

3.2.7 The Failure Effect Questions (FEQ) Form

3.2.8 The Task Selection Questions (TSQ) Form

3.2.9 Task Summary

3.3 Analysis Forms

3.4 Responsibilities

3.4.1 OEM/TCH

3.4.2 Partners, Suppliers & Vendors

3.4.3 Working Groups

3.4.4 Industry Steering Committee

3.5 Analysis Guidelines

3.6 Lightning/HIRF Protection System Analysis Procedures

3.6.1 Introduction

3.6.2 Propose for Consideration of Process Revision

3.6.3 Proposal

APPENDIX 4. RELEVANT FLOWCHARTS AND LETTERS

FIGURE 1. MAINTENANCE PROGRAM DEVELOPMENT PROCESS SELECTION FLOWCHART

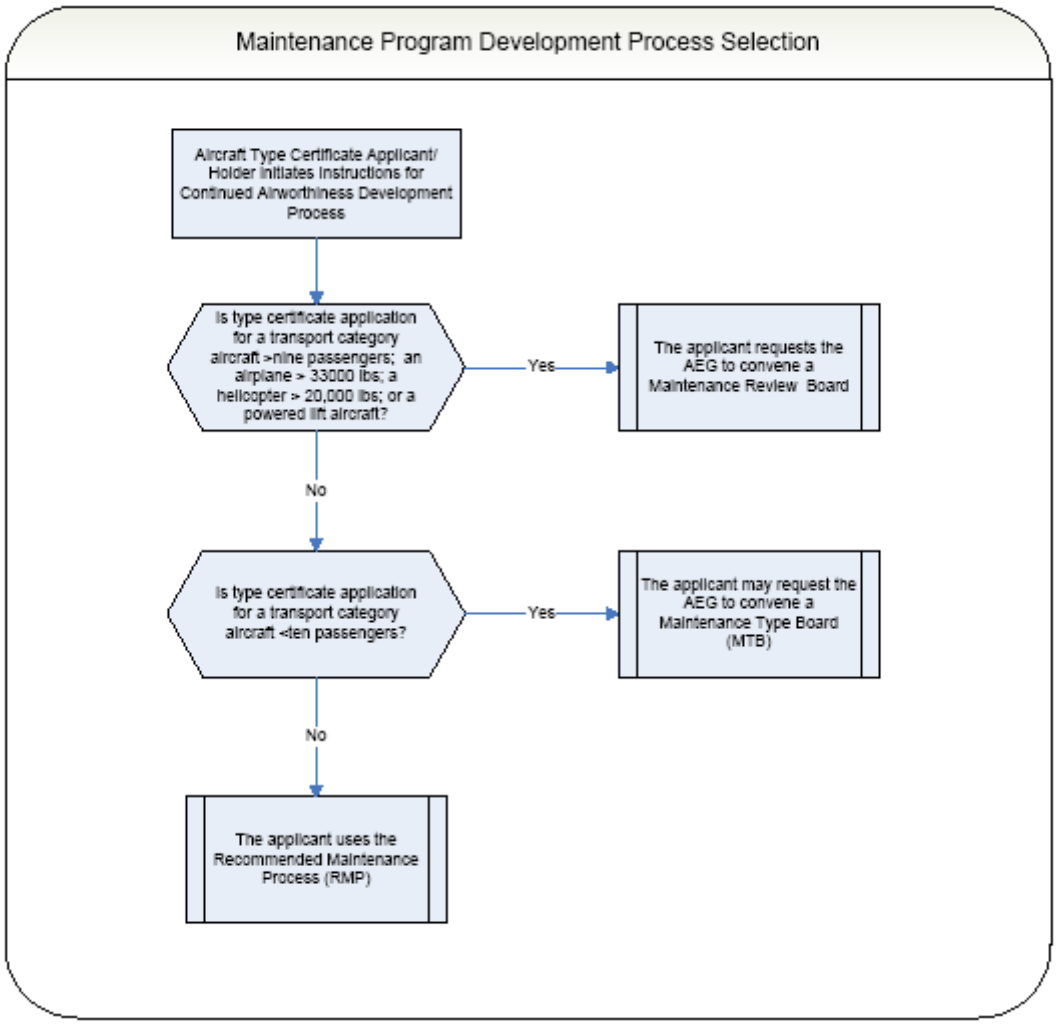


FIGURE 2. OEM/TCH REQUEST FOR AN MRB

January 31, 2007
[redacted]

To: [redacted]
[redacted]MRB Chairman
FAA AEG

Subject: [redacted] Maintenance Review Board Report Development

The purpose of this letter is to formally notify the FAA of [redacted]ntention to develop a proposal for establishing initial and follow-on aircraft and power plant scheduled maintenance/inspection requirements for the [redacted] airframe. This is the initial step for developing an FAA approved [redacted] MRBR in support of [redacted] certification activities.

This process will follow the basic guidelines contained in Advisory Circular (AC) 121-22A and the additional processes outlined in the [redacted] Policy and Procedures Handbook, currently under development. The [redacted] MRBR will be a separate document from the existing [redacted] MRBR.

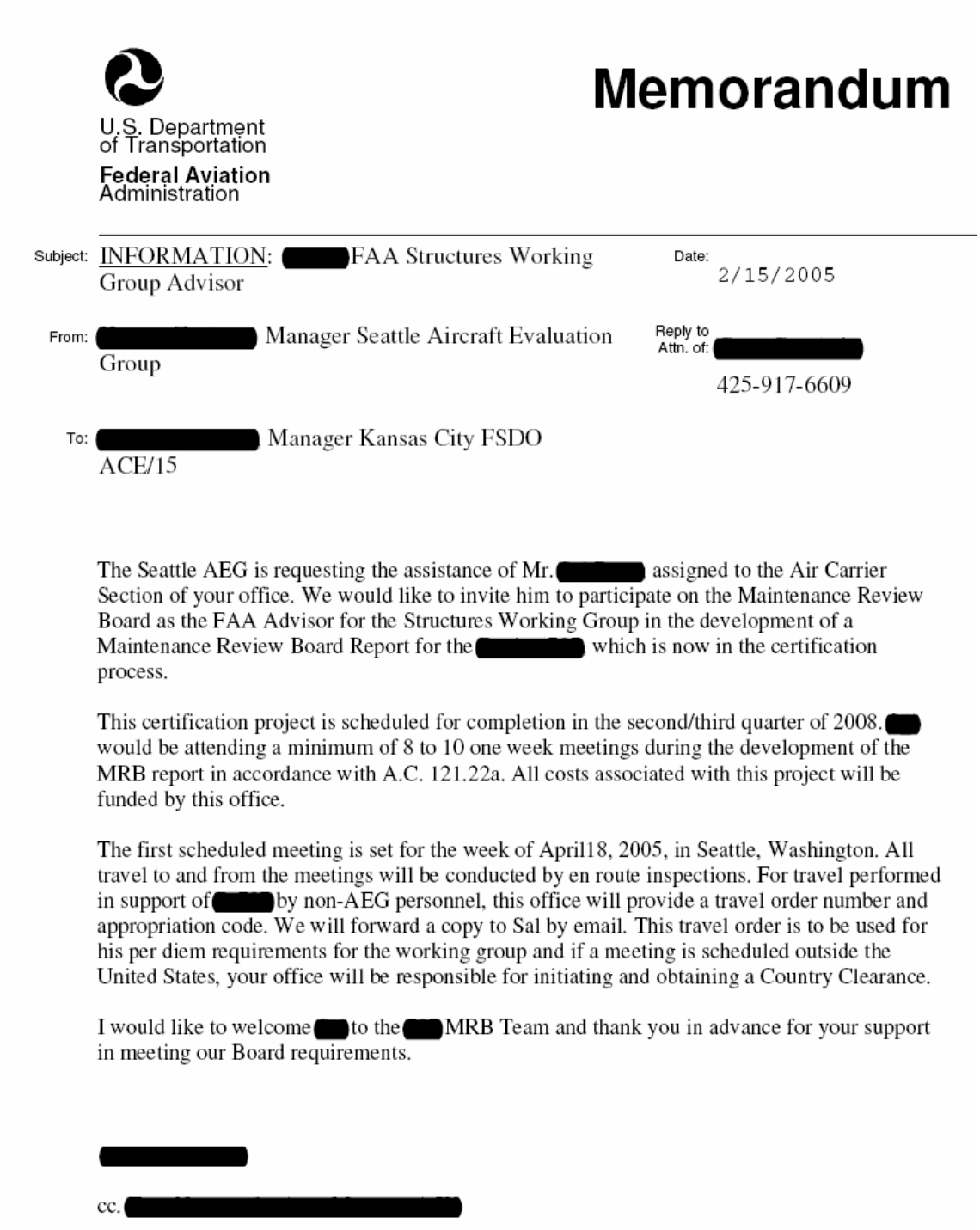
The initial ISC/MRB meeting is scheduled for September 11 through 14, 2007. At this meeting the [redacted] PPH will be discussed and approved by the ISC. In addition the [redacted]maintenance program development schedule will be reviewed and the ISC Chairperson will be selected. The meeting will also formally launch the MSG-3 analysis and Working Group activities. All ISC/MRB activities will be coordinated with the FAA MRB Chairman Mr. [redacted], FAA AEG.

Our goal is to have an FAA/EASA approved MRBR by first flight (approximately November, 2008).

We are looking forward to working with yourself and other FAA and EASA representatives, airline customers as well as suppliers on this project.

Prepared by: Approved by:

FIGURE 3. INVITE LETTER TO WG MEMBERS/ADVISORS



U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: INFORMATION: [redacted] FAA Structures Working Group Advisor

Date: 2/15/2005

From: [redacted] Manager Seattle Aircraft Evaluation Group

Reply to Attn. of: [redacted]
425-917-6609

To: [redacted] Manager Kansas City FSDO
ACE/15

The Seattle AEG is requesting the assistance of Mr. [redacted] assigned to the Air Carrier Section of your office. We would like to invite him to participate on the Maintenance Review Board as the FAA Advisor for the Structures Working Group in the development of a Maintenance Review Board Report for the [redacted] which is now in the certification process.

This certification project is scheduled for completion in the second/third quarter of 2008. [redacted] would be attending a minimum of 8 to 10 one week meetings during the development of the MRB report in accordance with A.C. 121.22a. All costs associated with this project will be funded by this office.

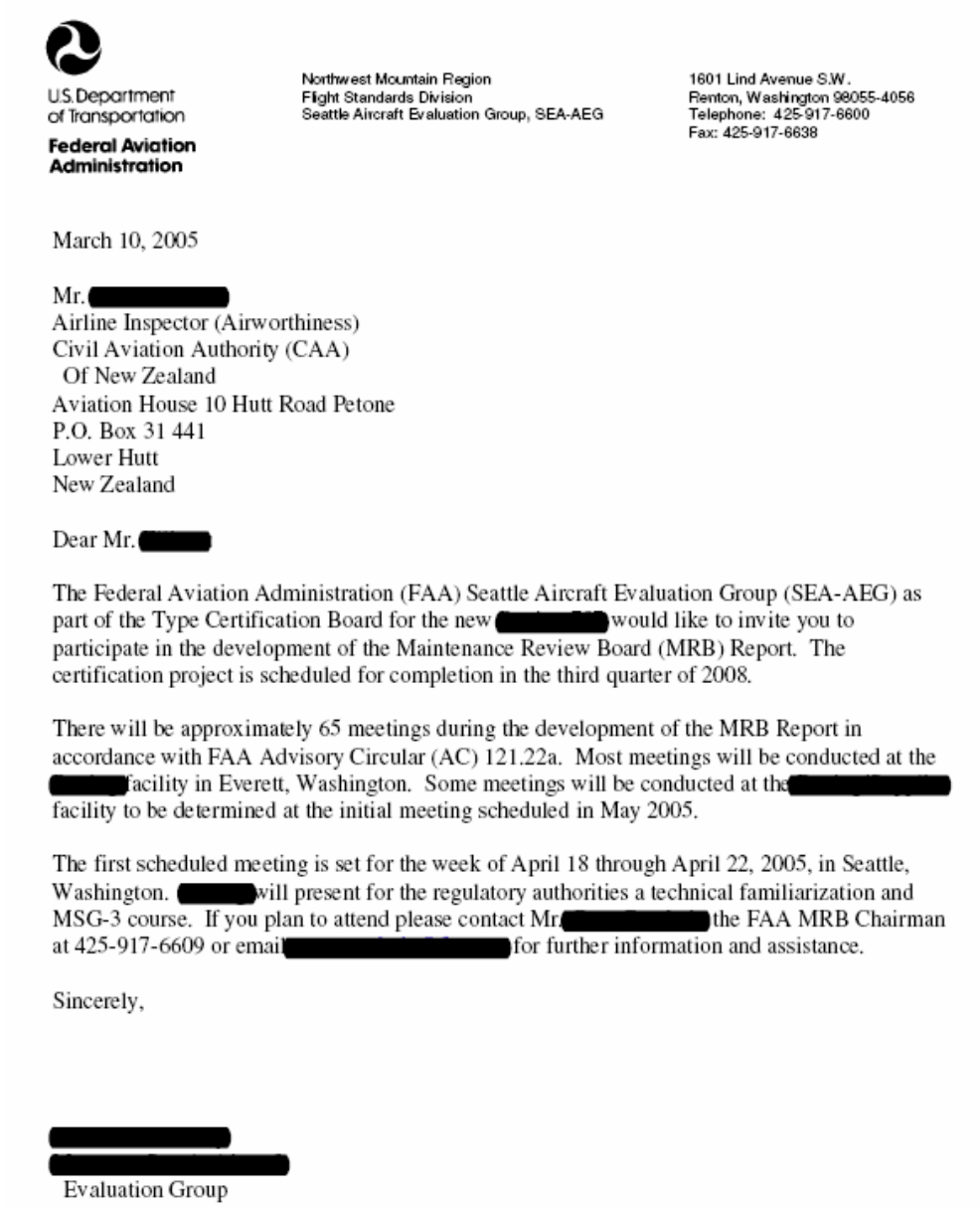
The first scheduled meeting is set for the week of April18, 2005, in Seattle, Washington. All travel to and from the meetings will be conducted by en route inspections. For travel performed in support of [redacted] by non-AEG personnel, this office will provide a travel order number and appropriation code. We will forward a copy to Sal by email. This travel order is to be used for his per diem requirements for the working group and if a meeting is scheduled outside the United States, your office will be responsible for initiating and obtaining a Country Clearance.

I would like to welcome [redacted] to the [redacted] MRB Team and thank you in advance for your support in meeting our Board requirements.

[redacted]

cc. [redacted]

FIGURE 4. REGULATORY LETTER OF PARTICIPATION



U.S.Department of Transportation
Federal Aviation Administration

Northwest Mountain Region
Flight Standards Division
Seattle Aircraft Evaluation Group, SEA-AEG

1601 Lind Avenue S.W.
Renton, Washington 98055-4056
Telephone: 425-917-6600
Fax: 425-917-6638

March 10, 2005

Mr. [redacted]
Airline Inspector (Airworthiness)
Civil Aviation Authority (CAA)
Of New Zealand
Aviation House 10 Hutt Road Petone
P.O. Box 31 441
Lower Hutt
New Zealand

Dear Mr. [redacted]

The Federal Aviation Administration (FAA) Seattle Aircraft Evaluation Group (SEA-AEG) as part of the Type Certification Board for the new [redacted] would like to invite you to participate in the development of the Maintenance Review Board (MRB) Report. The certification project is scheduled for completion in the third quarter of 2008.

There will be approximately 65 meetings during the development of the MRB Report in accordance with FAA Advisory Circular (AC) 121.22a. Most meetings will be conducted at the [redacted] facility in Everett, Washington. Some meetings will be conducted at the [redacted] facility to be determined at the initial meeting scheduled in May 2005.

The first scheduled meeting is set for the week of April 18 through April 22, 2005, in Seattle, Washington. [redacted] will present for the regulatory authorities a technical familiarization and MSG-3 course. If you plan to attend please contact Mr. [redacted] the FAA MRB Chairman at 425-917-6609 or email [redacted] for further information and assistance.

Sincerely,

[redacted]
[redacted]
Evaluation Group

FIGURE 5. LETTER OF CONFIRMATION TEMPLATE

NOTE: The following is a template of a letter to send to "guest National Aviation Authority (NAA)" chairperson. Copy the ISC chairperson, and TCH.

IP 83/IMRBPB AI N°05/07

Dear NAA Chairperson:

Per (Host NAA guidance), I would like to offer this letter of confirmation regarding the (TCH aircraft type) aircraft, MRBR revision xx.

As the host country for the (TCH aircraft Type) aircraft we (Host NAA) would like to define our requirements in accordance with our guidelines, and per the process agreed in the IMRBPB IP 83, for guest signatories' regulatory authorities. This letter will serve as the confirmation letter outlining our working relationship with your NAA. The guest signatory's regulatory authorities will perform the following functions regarding the (TCH aircraft Type) Aircraft MRB activities:

1. Participate in the development and acceptance of the PPH. Any NAA regulatory differences will be defined in an appendix to the PPH.

2. (Guest NAA] will coordinate all requested PPH changes through the (Host NAA) MRB chairperson.

3. Participate in the MRB WG activities; inform the (Host NAA) work group advisor of any national regulatory or technical differences. The (Host NAA) advisor will ask for regulatory concurrence. Any non-concurrence will be documented in the meeting minutes. In addition, any regulatory differences between the host country and signatory authorities at the completion of the MSG-3 process would be documented in a separate MRBR appendix.

4. The (Host NAA) advisor will ensure the conversation or debate over an issue ends in a timely fashion to ensure the completion of WG activities in the allotted time.

5. Attend ISC meetings by invitation from the ISC chairperson released through TCH in coordination with of the (Host NAA) MRB chairperson.

6. Notify the ISC chairperson, via the (host) MRB chairperson of any national regulatory differences before compiling the MRBR proposal.

The final responsibility of the (Guest NAA) will be to coordinate with the (Host NAA), the (Guest NAA) MRBR approval and appendixes, if applicable.

Sincerely,

Host NAA