

PANEL 5: Continued Airworthiness



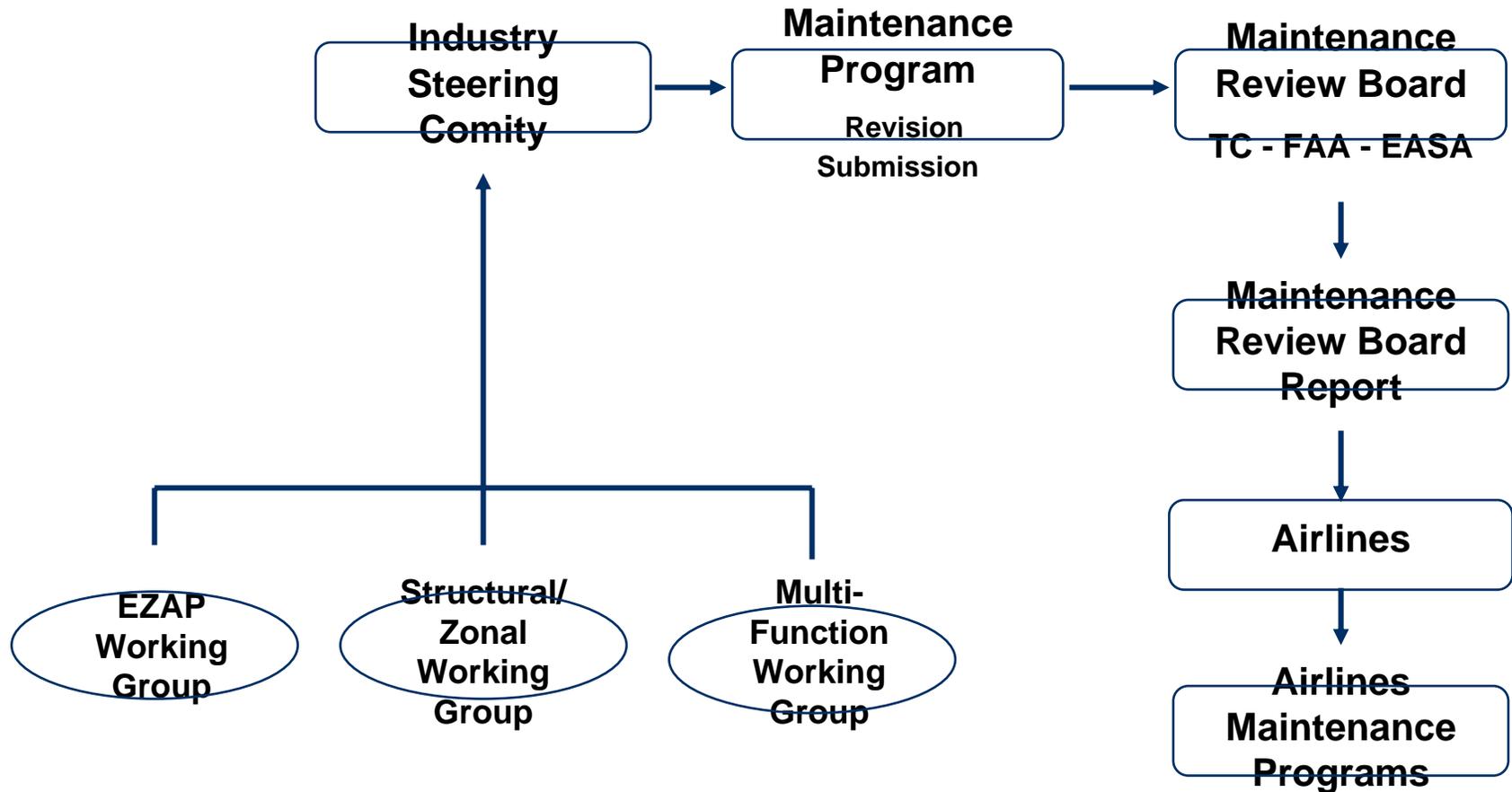
Fuselage Structural Integrity - CRJ Products

Presented by

**Manager - Structures – CRJ
In-Service Engineering**

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Design for Maintainability – CRJ Maintenance Review Board Organization



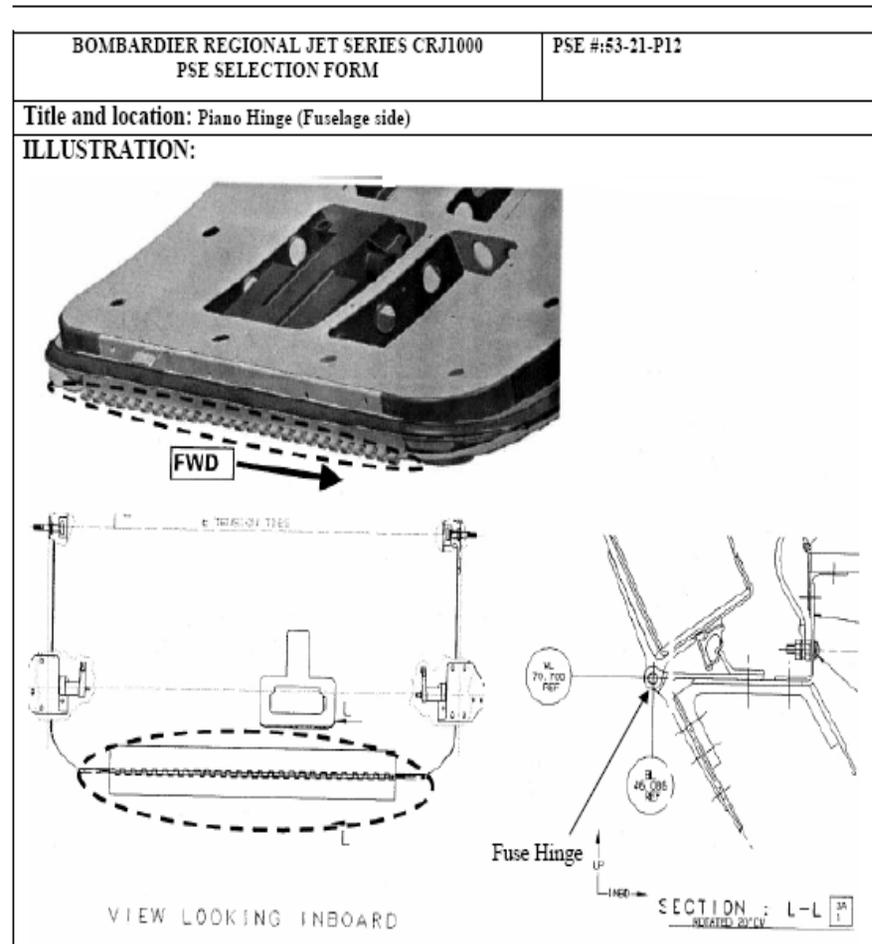
Design for Maintainability - Maintenance Program Development

- The CRJ initial maintenance requirements are contained in the Maintenance Review Board (MRB) report
 - Based on MSG-3 methodology
 - Critical structure is defined as Principal Structural Elements (PSEs)
 - Determines when elements have to be inspected, restored or replaced
- During the maintenance program development for structures, many factors are considered
 - “Inspectability” (difficulty of access, available lighting)
 - Susceptibility to Damage (Accidental Damage)
 - Environment Conditions (Environmental Deterioration)
 - Corrosion Prevention and Control Programs (CPCP)
 - Experience from similar previous products
- The requirements are published in the Maintenance Requirements Manual (MRM)
 - Contains all the elements to be monitored through the life of the aircraft
 - Inspections for Fatigue Damage (FD) are based on Engineering Analysis and can be found in the Limitations Section of the MRM

Design for Maintainability - PSE Selection Example

Critical structure identified as Principal Structural Elements (PSE)

- PSEs are determined based on
 - Criticality of function
 - Experience from similar previous products
 - Structural fatigue test results



Design for Maintainability – Validation and In-Service Findings

- The MRM is a living document. It is regularly updated based upon:
 - Findings from full-scale fatigue tests
 - In-service findings
 - Reports through the Customer Response Center
 - Reports through working group meetings
 - Reports through Bombardier Field Service Representatives
 - Data from Bombardier's fleet monitoring group (FRACAS)
 - Reports directly from local authorities
 - MRB recommendations
 - Structural Modifications
 - Operating weight increases
 - Customized Programs (Low aircraft utilization, Special Missions, High Altitude Operations, etc.)
 - New Regulations (e.g. SFAR 88, FAR 26)

Design for Maintainability – Validation and In-Service Findings

MRM Part 2 ALI Inspection Example

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CL-600-2C10, CL-600-2D15, CL-600-2D24, CL-600-2E25

AIRWORTHINESS LIMITATIONS

STRUCTURAL INSPECTIONS

TASK NUMBER	MODEL EFFECTIVITY	MANUAL REFERENCE	DESCRIPTION	INSPECT TYPE	INSPECTION INTERVAL (Flight Cycles)			
					THRESHOLD	INITIAL REPEAT	REPEAT CUT-IN	REPEAT
53-21-112	All		Passenger Door Piano Hinge	GVI	24000			1600
53-21-113	1000		Passenger Door Latch Pins	DI	35724			3581
	700/705/900	53-21-23-220-811	Passenger Door Latch Pins (Post SB 670BA-53-025 or A/C 10002, 10260-10999, 15071-15990)	DI	35724			3581
	700/705/900	53-21-23-220-811	Passenger Door Latch Pins (Pre SB 670BA-53-025)	DI	17245			2525

GVI = General Visual Inspection

DI = Detailed Inspection

SDI = Special Detailed Inspection (NDT)

Design for Maintainability – Addressing Fleet Findings

Safety Review Process

- A potential continuing airworthiness issue may be initiated from many sources
 - In-service events (Action Desk Requests/Service Event Reports)
 - Service difficulty reports (Service Difficulty Report)
 - Air safety investigations / Safety recommendations
 - Internal design reviews
 - Internal quality escapes
 - Supplier disclosures
- The Bombardier continuing airworthiness corrective action process has four basic phases:
 - Assessment
 - Corrective action decision
 - Implementation
 - Closure

Design for Maintainability – Addressing Fleet Findings

Safety Review Process

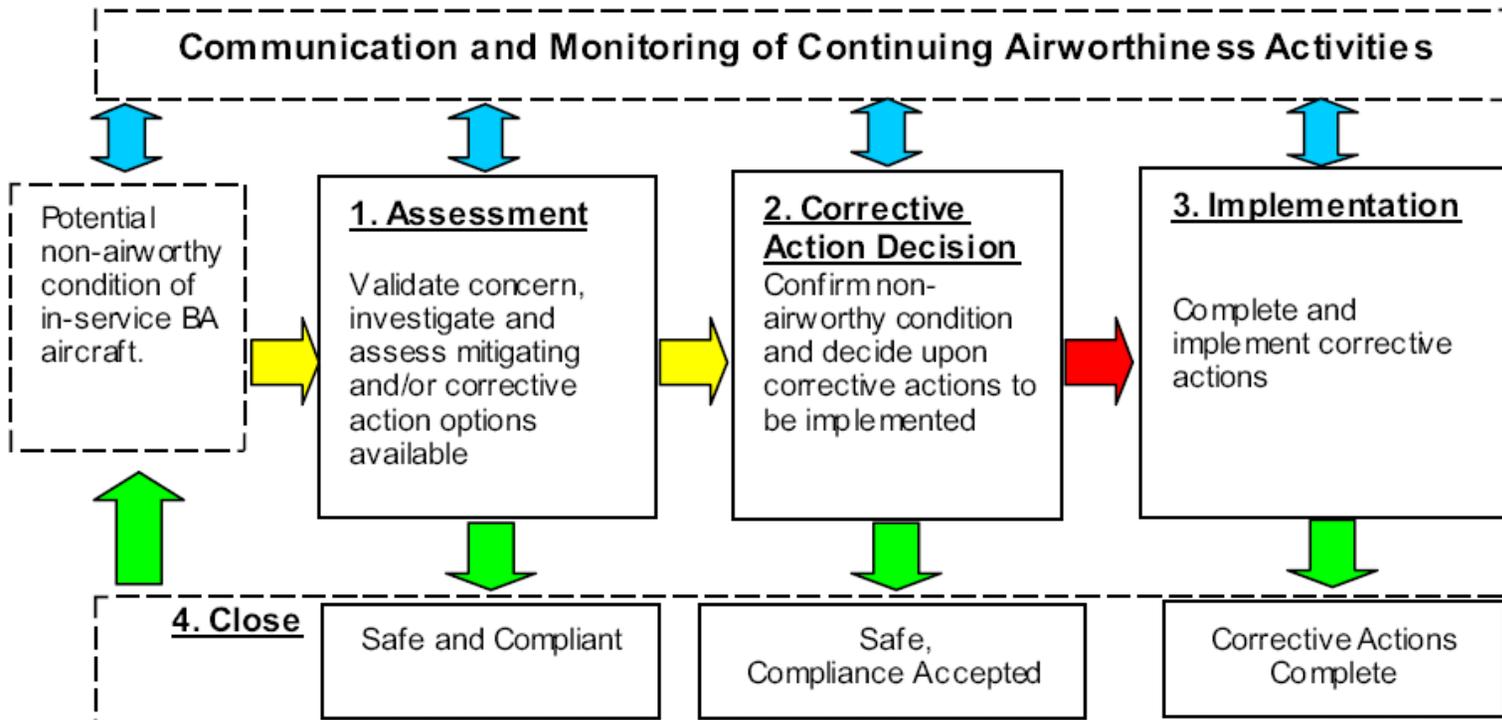


Figure 1: BA Continuing Airworthiness Corrective Action Process

Design for Maintainability – Addressing Fleet Findings

Service Bulletin Development

- Service Bulletins are issued to all operators with the intent of preventing or rectify discrepancies in service
 - The technical Content of the Service Bulletin is approved by the Bombardier Design Approval Organization
- In the case of an immediate safety issue, an Alert Service Bulletin will be issued expeditiously to operators via normal and electronic means
 - For an immediate threat to safety, an AD will be issued
- AD will normally originate with Transport Canada, with subsequent adoption by the FAA as an equivalent AD (FAA approval process)
- AD will usually refer to the applicable service documents (SB/Modification, Repair, etc) which must be incorporated to provide timely compliance and termination.

Design for Maintainability – Addressing Fleet Findings

Other Communication Tools

- All Operators call; intended to quickly and efficiently alert all operators of an emerging issue.
- All Operators Message (AOM); Informs Operators of significant issues which require immediate attention
- On-site Bombardier service representatives and customers account managers;
- Bombardier's official web site (Iflybombardier.com); provides access to all maintenance related documentation
- Service Letter (SL); General technical information which is not time-sensitive

