

Regulatory Review related to Part M Compliance

Review the Following

Details of ageing aircraft system requirements with any specified sampling programmes, (if applicable)

Details of specific structural maintenance programmes, (if applicable), including but not limited to:

a. Damage Tolerance and Supplemental Structural Inspection Programmes (SSID)

SUPPLEMENTAL STRUCTURAL INSPECTION PROGRAMME (SSIP)

Increased utilisation, longer operational lives, and the high safety demands imposed on the current fleet of transport aeroplanes indicate the need for a programme to ensure a high level of structural integrity for all aeroplanes in the transport fleet.

This AMC (20-20) is intended to provide guidance to TCHs and other DAHs to develop or review existing inspection programmes for effectiveness. SSIPs are based on a thorough technical review of the damage-tolerance characteristics of the aircraft structure using the latest techniques and changes in operational usage. They lead to revised or new inspection requirements primarily for structural cracking and replacement or modification of structure where inspection is not practical.

b. SB review performed by the TC holder

The case of an SB for which an AD has been issued, irrespective of whether it is designated by the TC/STC holder as 'mandatory', 'alert' or 'highly recommended', is clear: these are part of the Mandatory Continuing Airworthiness Instructions and must be applied in all cases.

The case of SBs designated as 'mandatory', 'alert' or 'highly recommended' by the TC/STC holder for which no AD has been issued is more complex and the following cases should be considered:

The TC/STC holder subsequently includes such SB (e.g. repetitive inspection instructions) in the manufacturer maintenance programme (Maintenance Review Board Report (MRBR) or Manufacturer Recommended Programme) for the aircraft concerned. In this case, the SB under consideration will need to be included in the aircraft maintenance programme as defined in Commission Regulation (EU) No 1321/2014, M.A.302(d) and (g) (see also AMC M.A.302(d)) to ensure compliance with instructions for continuing airworthiness issued by the TC/STC holder.

The TC/STC holder does not include such SB in the manufacturer maintenance programme (MRBR or Manufacturer Recommended Programme) for the aircraft concerned. In this case, the final decision to apply such SB lies with the owner/operator or contracted CAMO, as M.A.302(g) does not apply.

The TC/STC holder issues an SB defining a modification, the related embodiment instruction and the relevant scheduled maintenance requirements, where these may or may not be subsequently included in the manufacturer maintenance programme (MRBR or Manufacturer Recommended Programme) for the aircraft concerned. In case the SB will not be included in the manufacturer maintenance programme, the final decision to apply it or not lies with the owner/ operator or contracted CAMO. If the final decision is to apply the SB, then the aircraft maintenance programme needs to be updated to include the scheduled maintenance requirements.

Finally, in relation to points 2. and 3. above, for all non-mandatory modifications and/or inspections, including SBs classified by the TC/STC holder as 'mandatory', 'alert' or 'highly recommended' and not covered by a corresponding AD, for all large aircraft, or aircraft used in commercial air transport, an embodiment policy is to be established, as required by M.A.301(7.). That policy should then result in a substantiated (and recorded) operator's decision for each SB to apply it, or not.

c. Corrosion Prevention and Control

The operator's continuous analysis and surveillance system should contain procedures to review corrosion inspection task findings and establish corrosion levels. These procedures should provide criteria for determining if findings that exceed allowable limits are an isolated incident not typical of the operator's fleet. The operator's programme should also provide for notifying the competent authority

Whenever a determination of Level 2 or Level 3 corrosion is made. Due to the potential urgent airworthiness concern associated with a Level 3 finding, the operator's procedures should provide for notification as soon as possible but not later than 3 calendar days after the Level 3 determination has been made.

d.Repair Assessment

Where repair evaluation guidelines, repair assessment programmes or similar documents have been published by the TCH they should be incorporated into the aircraft's maintenance programme according to Part-M requirements.

This fatigue and damage-tolerance evaluation of repairs will establish an appropriate inspection programme or a replacement schedule if the necessary inspection programme is too demanding or not possible. See AMC 20-20 Appdx 3

e. Widespread Fatigue Damage

The likelihood of the occurrence of fatigue damage in an aircraft's structure increases with aircraft usage. The design process generally establishes a design service goal (DSG) in terms of flight cycles/hours for the airframe. It is generally expected that any cracking that occurs on an aircraft operated up to the DSG will occur in isolation (i.e., local cracking), originating from a single source, such as a random manufacturing flaw (e.g., a mis-drilled fastener hole) or a localised design detail. It is considered unlikely that cracks from manufacturing flaws or localised design issues will interact strongly as they grow. (Widespread Fatigue Damage EFD)

f. Limit of Validity

Limit of validity (LOV) is the period of time, expressed in appropriate units (e.g. flight cycles) for which it has been shown that the established inspections and replacement times will be sufficient to allow safe operation and in particular to preclude development of widespread fatigue damage. The LOV should be based on fatigue test evidence.

1/ Review of Certification Statement

A Statement signed by the AM / NP similar to the following should be evident

2/ Baseline Utilisation

Check periods for anticipated utilisation; include a utilisation tolerance of not more than 25%. Where utilisation cannot be anticipated, calendar time limits should also be included

The MRB will identify a 'typical' flight profile for their product. Consider an aircraft type might reasonably expect a normal profile of about seven Flying Hours to one Flight Cycle (depending on the A/C) as well expected normal annual utilisation.

Operators are required to state their expected annual utilisation in the Maintenance Schedule. Part of the annual review of effectiveness is to determine that this figure remains within plus or minus 25% of that figure. If the deviation is out of the 25% range, the responsible Operator should conduct a review of the Maintenance Schedule with the TCH to see if any amendment is required.

3/ Escalation Procedures – Procedures for escalation where applicable & acceptable to the CAA

Under controlled conditions, an operator may use a short term escalation (overrun) for an individual component, engine, or aircraft without affecting safety. These procedures require approval and close monitoring to ensure that they do not conceal

unsound maintenance practices, maintenance program deficiencies, or poor management decisions.

What would drive a De- Escalation?

4/ Pre-flight

- a) Maintenance tasks that are accomplished by maintenance staff (How managed?)
- b) Flight Crew Authorisation – How managed?

5/ Source of AMP

Consider AMP Content – MPD (Consider the process by which any deviations may have been developed – ref to source and original MRBR reference)

The MPD scheduled maintenance tasks should not be considered as all-inclusive. Each individual airline has final responsibility to decide what to do and when to do it, except for those maintenance requirements identified as “Airworthiness Limitations” (AL) or “Certification Maintenance Requirements” (CMR).

Additional requirements in the form of Service Letters, Service Bulletins and Airworthiness Directives are the responsibility of the individual airline to incorporate.

Maintenance tasks recommended in engine, APU, and vendor manuals should also be considered.

6/ Ageing Aircraft

The TCH is responsible for developing the ageing aircraft structures programme for each aircraft type, detailing the actions necessary to maintain airworthiness. Other DAH should develop programmes or actions appropriate to the modification/repair for which they hold approval, unless addressed by the TCH. All DAHs will be responsible for monitoring the effectiveness of their specific programme, and to amend the programme as necessary.

(ii) The Operator is responsible for incorporating approved DAH actions necessary to maintain airworthiness into its aircraft specific maintenance programmes, in accordance with Part-M.

(iii) The competent authority of the state of registry is responsible for ensuring the implementation of the ageing aircraft programme by their operators.

7/ CDDCL

Availability of Procedures related to the management of CDCCL

CDCCLs are design features that have been identified as being critical to the integrity of the Fuel System and must be maintained in order to ensure that unsafe conditions do not develop throughout the service life of the aircraft and must be retained during modification, repair or maintenance.

7/ Airworthiness Documents Cross Reference

Review the following for incorporation within the AMP:

a. Mandatory life limitations

Mandatory replacement times for structural safe-life parts and mandatory inspection requirements for damage tolerant parts are included in the Airworthiness Limitations, required by the regulatory authorities as part of the Instructions for Continued Airworthiness, hence they are not part of the MSG-3 scope.

b. Certification Maintenance Requirements (CMR's), (if applicable)

CMRs arise from the aircraft type certification process. FAR/CS 25.1309, for example, requires a System Safety Assessment (SSA) to ensure that failures are categorized on their consequential severity and within defined bounds of probability.

c. Airworthiness Directives (AD)

An Airworthiness Directive (AD) is a notification to Type Certificate Holders (TCH), Supplemental Type Certificate Holders (STCH) owners and operators of certified Aircraft, Engines or Components.

That a known safety related deficiency in respect of an aircraft, engine, or component has been found which must be corrected. Such correction may be based on compliance with an existing service bulletin (SB) or in accordance with explicit instructions contained within the AD.

d. Airworthiness Limitations

ALIs are structural items that the Certification process has defined as critical from a fatigue point of view during the Damage Tolerance assessment. (Essentially FAA)

Concerning EASA & ALS

Airbus ALS Part 1 – Safe life is applied to limit the maximum service life of a component, by testing and/or calculations using the known properties of the component's materials. Safe Life – Safe Life Airworthiness Limitation Items ALS Part 1

Airbus ALS Part 2 – Fail Safe -Damage Tolerance Analysis – leading to Damage Tolerant Airworthiness Limitation Items ALI ALS Part 2

Airbus ALS Part 3 – System Safety Assessment (SSA) pre Design Service Goal (DSG) + Maintenance Steering Group 3 Analysis provides for Certification Maintenance Requirements (CMR) ALS Part 3

Airbus ALS Part 4 – And System Safety Assessment (SSA) post Design Service Goal (DSG) + Maintenance Steering Group 3 Analysis + System Life Limits provides for Aging System Maintenance ASM ALS Part 4

Airbus ALS Part 5 – Fuel Tank /System Analysis leading to Fuel Airworthiness Limitations ALS Part 5

Airbus ALS Part 6 – ALS Part 6 is a recent addition and concerns Aircraft Information System Security (AISS) -(What are the safety issues for aircraft)?

Safe and reliable aircraft (airframe systems) -Safe and reliable navigation – Takeoff, landing, in-route (airway) navigation. Collision avoidance, Position-Location. Safe and secure cockpit and cabin. Secure and reliable aircraft communications. Air-to-ground 2-way communications, Air-to- Air 2-way communications. Air Traffic Control radar transponder. Cockpit Voice Recorder. Flight Data Recorder.

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