



EUROPEAN MILITARY AIRWORTHINESS REQUIREMENT

EMAR M

AMC & GM

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NOTE:

This EMAR AMC & GM relies on definitions laid down in EMAD 1.

This EMAR AMC & GM relies on the EASA “Easy Access Rules for Continuing Airworthiness (Regulation (EU) No 1321/2014)” published in July 2021.

The Forms referred to in this document can be found in the EMAR Forms document.

The term “contract” covers all types of written arrangements within military context (e.g. arrangement, tasking, agreement).

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ACCEPTABLE MEANS OF COMPLIANCE & GUIDANCE MATERIAL

SECTION A

TECHNICAL REQUIREMENTS

SUBPART A - GENERAL

SUBPART B - ACCOUNTABILITY

GM M.A.201 Responsibilities

NOT APPLICABLE.

AMC M.A.201(a) Responsibilities

Reference to aircraft includes the components fitted to or intended to be fitted to the aircraft.

GM1 M.A.201(a) Responsibilities

1. Within the context of EMAR M, an Operating Organisation is to be understood as a force structure that operates military aircraft and is responsible for their Continuing Airworthiness.
2. The force structure may be a Flight, Squadron, Wing, Command or other organisation as determined by the pMS.

GM2 M.A.201(a) Responsibilities

'Accountable' as used in EMAR M.A.201 stresses that this responsibility cannot be delegated.

GM3 M.A.201(a) Responsibilities

Where an Operating Organisation has responsibility for the Continuing Airworthiness of military aircraft that have been issued with a Military Permit to Fly (MPTF), the national decrees/laws/regulations applicable to these aircraft are to be followed, supplemented by the conditions identified in EMAR 21 Subpart P.

AMC M.A.201(d) Responsibilities

'Qualified person' in this context means an individual who has received appropriate training for the relevant pre-flight inspection tasks to a standard as described in [AMC M.A.301\(a\)](#) subparagraph 3.

GM M.A.201(e) Responsibilities

NOT APPLICABLE.

AMC M.A.201(e)(2) Responsibilities

NOT APPLICABLE.

AMC M.A.201(g) Responsibilities

1. The performance of ground de-icing and anti-icing activities does not require an EMAR 145 maintenance organisation approval. Nevertheless, inspections required to detect, and when necessary eliminate de-icing and/or anti-icing fluid residues are considered maintenance. Such inspections should only be carried out by suitably authorised personnel.
2. The CAMO should ensure adequate co-ordination between flight operations and maintenance to ensure that both will receive all information on the condition of the aircraft necessary to enable both to perform their tasks.
3. The requirement means that even if the maintenance is performed by an approved EMAR 145 Maintenance Organisation (MO), the Operating Organisation remains responsible for the

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airworthy condition of aircraft it operates and thus should be satisfied before the intended flight that all required maintenance has been properly carried out.

4. When an Operating Organisation contracts the maintenance to an approved EMAR 145 MO it may check the maintenance facilities on any aspect of the contracted work if it wishes to do so to satisfy its responsibility for the airworthiness of the aircraft.

5. If the Operating Organisation is approved in accordance with EMAR CAMO, the approval does not prevent the Operating Organisation subcontracting certain continuing airworthiness management tasks to qualified organisations. This activity is considered as an integral element of the Operating Organisation's EMAR CAMO approval. The regulatory monitoring is exercised through the Operating Organisation's EMAR CAMO approval. The continuing airworthiness management tasks of the contract should be acceptable to the National Military Airworthiness Authority (NMAA).

6. The accomplishment of continuing airworthiness activities forms an important part of the Operating Organisation's responsibility with the Operating Organisation remaining accountable for satisfactory completion irrespective of any contract that may be established.

7. The Operating Organisation is ultimately responsible and therefore accountable for the airworthiness of its aircraft. To exercise this responsibility the Operating Organisation should be satisfied that the actions taken by contracted organisations meet the standards required by EMAR CAMO. The Operating Organisation's management of such activities should therefore be accomplished by:

(a) active control through direct involvement; and/or

(b) endorsing the recommendations made by the contracted organisation.

8. The Operating Organisation's management controls associated with subcontracted continuing airworthiness management activities should be reflected in the associated written contract and be in accordance with the Operating Organisation's policy and procedures defined in their Continuing Airworthiness Management Exposition (CAME). When such tasks are subcontracted the Operating Organisation's continuing airworthiness management system is considered to be extended to the subcontracted organisation.

9. With the exception of engines and Auxiliary Power Units, subcontracting should normally be limited to one organisation per aircraft type for any combination of the activities described in Appendix II to AMC1 CAMO.A.125(d)(3). Where arrangements are made with more than one organisation the Operating Organisation should demonstrate that adequate co-ordination controls are in place and that the individual responsibilities are clearly defined in related contracts.

10. Contracts should not authorise the subcontracted organisation to further subcontract to other organisations elements of the continuing airworthiness management tasks.

GM M.A.201(i) Aircraft Maintenance Programme

NOT APPLICABLE.

AMC M.A.201(i)(3) Responsibilities

NOT APPLICABLE.

GM1 M.A.201(k) Responsibilities

NOT APPLICABLE.

AMC M.A.202(a) Occurrence reporting

Operating Organisations should ensure that the (Military) Type Certificate ((M)TC) holder receives adequate reports of occurrences for that aircraft type, to enable it to issue appropriate service instructions and recommendations.

Liaison with the (M)TC holder is recommended to establish whether published or proposed service information will resolve the problem or to obtain a solution to a particular problem.

An approved CAMO or MO should assign responsibility for co-ordinating action on airworthiness occurrences and for initiating any necessary further investigation and follow-up activity to a suitably qualified person with clearly defined authority and status.

The aim of occurrence reporting is to identify the factors contributing to incidents and to make the system resistant to similar errors. An occurrence reporting system should enable and encourage free and frank reporting of any (potentially) safety related occurrence. This should be facilitated by the establishment of a “just culture”. An organisation should ensure that personnel are not inappropriately punished for reporting or co-operating with occurrence investigations. The internal reporting process should be closed-loop, ensuring that actions are taken internally to address safety hazards. Feedback to reportees, both on an individual and more general basis, is important to ensure their continued support for the scheme.

‘Qualified person’ in this context means an individual who has received appropriate training and has relevant experience in the management of airworthiness occurrences detailed in EMAR M.A.202. In the case of a contracted CAMO, close coordination between the CAMO and the Operating Organisation is needed to define the appropriate training and relevant experience and to ensure that such person is officially on record at the CAMO.

‘Endanger flight safety’ means any instance where safe operation could not be assured or which could lead to an unsafe condition. It typically includes, but is not limited to, significant cracking, deformation, corrosion or failure of primary structure, any evidence of burning, electrical arcing, significant hydraulic fluid or fuel leakage and any emergency system or total system failure. An Airworthiness Directive overdue for compliance is also considered a hazard to flight safety.

AMC M.A.202(b) Occurrence reporting

The reports may be transmitted by any method, i.e. electronically or by post.

Each report should contain at least the following information:

- organisation’s name and approval reference,
- information necessary to identify the subject aircraft and/or component,
- date and time relative to any life or overhaul limitation in terms of flying hours/cycles/landings etc., as appropriate,

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– details of the occurrence.

EMAD 20-8 General Acceptable Means of Compliance for Airworthiness of Products, Parts and Appliances provides further guidance on occurrence reporting. EMAR Form 44 "Technical Occurrence Report" or national equivalent should be used.

SUBPART C - CONTINUING AIRWORTHINESS

AMC M.A.301(a) Continuing airworthiness tasks

PRE-FLIGHT INSPECTIONS

1. With regard to the pre-flight inspection it is intended to mean all of the actions necessary to ensure that the aircraft is fit to make the intended flight. These should typically include but are not necessarily limited to:

- (a) a walk-around type inspection of the aircraft, its emergency equipment and any stores/weapons carried for condition including, in particular, any obvious signs of wear, damage or leakage. In addition, the presence of all required equipment, including emergency equipment, should be established and the security of attachment of any stores/weapons carried should be checked;
- (b) an inspection of the aircraft continuing airworthiness record system or the aircraft technical log system as applicable to ensure that the intended flight is not adversely affected by any outstanding deferred defects and that no required maintenance action shown in the maintenance statement is overdue or will become due during the flight;
- (c) a control that consumable fluids, gases etc. uplifted prior to flight are of the correct specification, free from contamination, and correctly recorded;
- (d) a control that all doors are securely fastened;
- (e) a control that control surface and landing gear locks, pitot/static covers, restraint devices and engine/aperture blanks have been removed;
- (f) a control that all the aircraft's external surfaces and engines are free from ice, snow, sand, dust etc. and an assessment to confirm that, as the result of meteorological conditions and de-icing/anti-icing fluids having been previously applied on it, there are no fluid residues that could endanger flight safety. Alternatively to this pre-flight assessment, when the type of aircraft and nature of operations allow for it, the build-up of residues may be controlled through scheduled maintenance inspections/cleanings identified in the Aircraft Maintenance Programme (AMP);
- (g) removal of safety/arming pins if applicable.

2. Tasks such as oil and hydraulic fluid uplift and tyre inflation may be considered as part of the pre-flight inspection. The related pre-flight inspection instructions should address the procedures to be taken to determine whether the necessary fluid uplift or tyre inflation results from an abnormal consumption/excessive leakage, thereby possibly requiring additional maintenance action by the approved maintenance organisation.

3. Operating Organisation/CAMO should publish guidance to maintenance, flight personnel and any other personnel performing pre-flight inspection tasks, as appropriate, defining their responsibilities for these actions and, where tasks are contracted by the CAMO to other organisations, how their accomplishment is subject to the management system required by EMAR CAMO.A.200. It should be demonstrated to the NMAA that pre-flight inspection personnel have received appropriate training for the relevant pre-flight inspection tasks. The training standard for personnel performing the pre-flight inspection should be described in the CAME.

AMC M.A.301(b) Continuing airworthiness tasks

1. The CAMO should have a system to ensure that all defects affecting the safe operation of the aircraft are rectified within the limits prescribed by the approved Minimum Equipment List (MEL),

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Configuration Deviation List (CDL) or national equivalents, or maintenance data, as appropriate. Such defect rectification cannot be postponed unless agreed by the CAMO and in accordance with a procedure approved by the NMAA.

2. When deferring or carrying forward a defect rectification, the cumulative effect of a number of deferred or carried forward defects on a given aircraft and any restrictions contained in the MEL/CDL or national equivalents should be considered. Whenever possible, deferred defect rectification should be made known to the pilot/flight crew prior to their arrival at the aircraft.

3. A system of assessment should be in operation to support the continuing airworthiness of an aircraft and to provide a continuous analysis of the effectiveness of the CAMO's defect control system in use.

The system should provide for:

(a) significant incidents and defects: monitor incidents and defects that have occurred in flight and defects found during maintenance and overhaul, highlighting any that appear significant in their own right.

(b) repetitive incidents and defects: monitor on a continuous basis defects occurring in flight and defects found during maintenance and overhaul, highlighting any that are repetitive.

(c) deferred and carried forward defects: monitor on a continuous basis deferred and carried forward defects. Deferred defects are defined as those defects reported in operational service which are deferred for later rectification. Carried forward defects are defined as those defects arising during maintenance which are carried forward for rectification at a later maintenance input.

(d) unscheduled removals and system performance: analyse unscheduled component removals and the performance of aircraft systems for use as part of the AMP efficiency.

AMC M.A.301(c) Continuing airworthiness tasks

MAINTENANCE IN ACCORDANCE WITH THE AMP

The CAMO should have a system to ensure that all aircraft maintenance checks are performed within the limits prescribed by the AMP and that, whenever a maintenance check cannot be performed within the required time limit, its postponement is allowed in accordance with a procedure agreed by the NMAA.

AMC M.A.301(e) Continuing airworthiness tasks

The CAMO should have a system to analyse the effectiveness of the AMP, with regard to spares, established defects, malfunctions and damage, and to amend the AMP accordingly.

AMC M.A.301(f) Continuing airworthiness tasks

OPERATIONAL DIRECTIVES

Operational directives with a continuing airworthiness impact include operating rules such as Extended Twin-engine Operations (ETOPS) / Long Range Operations (LROPS), Reduced Vertical Separation Minima (RVSM), Minimum Navigation Performance Specification (MNPS), All Weather Operations (AWOPS), Area Navigation (RNAV), etc.

Any other continuing airworthiness requirement established by the NMAA includes (M)TC related requirements such as: Certification Maintenance Requirements (CMR), life limited parts,

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airworthiness limitations from the aircraft type-certification basis, fuel tank system airworthiness limitations including Critical Design Configuration Control Limitations (CDCCL), etc.

The Operating Organisation is responsible for the incorporation of operational directives and in cases where there is an impact on the continuing airworthiness, the CAMO has to assess this and take appropriate actions to ensure the continuing airworthiness. The process to incorporate the operational directives should be detailed in an arrangement or common procedure.

GM M.A.301(i) Continuing airworthiness tasks

MAINTENANCE CHECK FLIGHTS (MCFs)

(a) MCFs are carried out under the control and responsibility of the Operating Organisation.

During the flight preparation, the flight and the post-flight activities as well as for the aircraft handover, the processes requiring the involvement of the maintenance organisations or their personnel should be agreed in advance with the Operating Organisation. The Operating Organisation should consult as necessary with the CAMO in charge of the airworthiness of the aircraft.

(b) Depending on the aircraft defect and the status of the maintenance activity performed before the flight, different scenarios are possible and are described below:

(1) The Aircraft Maintenance Manual (AMM), or any other maintenance data issued by the design approval holder, requires that an MCF be performed before completion of the maintenance ordered. In this scenario, a certificate of release to service (CRS) after incomplete maintenance, when in compliance with EMAR 145.A.50(e), should be issued by the maintenance organisation and the aircraft can be flown for this purpose under its MCoA. Due to incomplete maintenance, it is advisable to open a new entry in the aircraft technical log system to identify the need for an MCF. This new entry should contain or refer to, as necessary, data relevant to perform the MCF, such as aircraft limitations and any potential effect on operational and emergency equipment due to incomplete maintenance, maintenance data reference and maintenance actions to be performed after the flight. After a successful MCF, the maintenance records should be completed, the remaining maintenance actions finalised and the aircraft released to service in accordance with the maintenance organisation's approved procedures.

(2) Based on its own experience and for reliability considerations and/or quality assurance, an Operating Organisation or CAMO may wish to perform an MCF after the aircraft has undergone certain maintenance while maintenance data does not call for such a flight. Therefore, after the maintenance has been properly carried out, a CRS is issued and the MCoA remains valid for this flight.

(3) After troubleshooting of a system on the ground, an MCF is proposed by the maintenance organisation as confirmation that the solution applied has restored the normal system operation. During the maintenance performed, the maintenance instructions are followed for the complete restoration of the system and therefore a CRS is issued before the flight. The MCoA is valid for the flight.

An open entry requesting this flight may be recorded in the aircraft technical log system.

(4) An aircraft system has been found to fail, the dispatch of the aircraft is not possible in accordance with the maintenance data, and the satisfactory diagnosis of the cause of the fault can only be made in flight. The process for this troubleshooting is not described in the maintenance data and therefore scenario (1) does not apply. Since the aircraft cannot fly under its airworthiness certificate because it has not been released to service after

maintenance, a MPTF issued in accordance with EMAR 21 Subpart P is required. After the flight and the corresponding maintenance work, the aircraft can be released to service and continue to operate under its MCoA.

(c) For certain MCFs the data obtained or verified in flight will be necessary for assessment or consideration after the flight by the maintenance organisation prior to issuing the maintenance release. For this purpose, when the personnel of the maintenance organisation cannot perform these functions in flight, the maintenance organisation may rely on the crew performing the flight to complete this data or to make statements about in-flight verifications. In this case, the maintenance organisation should appoint the crew personnel to play such a role on their behalf and, before the flight, brief appointed crew personnel on the scope, functions and the detailed process to be followed, including required reporting information after the flight and reporting means, in support of the final release to service to be issued by the certifying staff.

AMC M.A.302 Aircraft Maintenance Programme (AMP)

BASIC PRINCIPLES

1. The term 'Aircraft Maintenance Programme (AMP)' is intended to include scheduled maintenance tasks, their associated maintenance procedures and standard maintenance practices. The term "maintenance schedule" is intended to embrace the scheduled maintenance tasks alone.
2. The aircraft should only be maintained to one approved AMP at a given point in time. Where an Operating Organisation wishes to change from one approved AMP to another, a transfer check or inspection may need to be performed in order to implement the change.
3. The AMP details should be reviewed at least annually. As a minimum, revisions of documents affecting the AMP basis need to be considered by the Operating Organisation/CAMO for inclusion in the AMP during the annual review. Applicable mandatory requirements for compliance with EMAR 21 should be incorporated into the AMP as soon as possible.
4. The AMP should contain a preface which will define the AMP contents, the inspection standards to be applied, permitted variations to task frequencies and, where applicable, any procedure to manage the evolution of established check or inspection intervals.
5. Repetitive maintenance tasks derived from modifications and repairs should be incorporated into the AMP.
6. [Appendix I to AMC M.A.302 and AMC M.B.301\(b\)](#) provide detailed information on the contents of an approved AMP.

GM M.A.302(a) Aircraft Maintenance Programme (AMP)

An AMP may indicate that it applies to several aircraft registration numbers as long as the AMP clearly identifies the effectivity of the tasks and procedures that are not applicable to all of the listed registration numbers.

AMC M.A.302(d) Aircraft Maintenance Programme (AMP)

AMP BASIS AND ASSOCIATED PROGRAMMES

1. An AMP should normally be based upon the Maintenance Review Board (MRB) report or equivalent report where applicable, the Maintenance Planning Document (MPD), the relevant chapters of the maintenance manual or any other maintenance data containing information on

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scheduling. Furthermore, an AMP should also take into account any maintenance data containing information on scheduling for components.

2. Instructions issued by the NMAA can encompass all types of instructions from a specific task for a particular aircraft to complete recommended maintenance schedules for certain aircraft types that can be used by the Operating Organisation directly. These instructions may be issued by the NMAA in the following cases:

- in the absence of specific recommendations of the (Military) Type Certificate Holder;
- to provide alternative instructions to those described in the subparagraph 1 above, with the objective of providing flexibility to the Operating Organisation.

3. Where an aircraft type has been subjected to the MRB report process, an Operating Organisation/CAMO should normally develop the initial AMP based upon the MRB report.

4. Where an aircraft is maintained in accordance with an AMP based upon the MRB report process, any associated programme for the continuous surveillance of the reliability, or health monitoring of the aircraft should be considered as part of the AMP.

5. AMPs for aircraft types subjected to the MRB report process should contain identification cross reference to the MRB report tasks such that it is always possible to relate such tasks to the current approved AMP. This does not prevent the approved AMP from being developed in the light of service experience to beyond the MRB report recommendations but will show the relationship to such recommendations.

6. Some approved AMPs, not developed from the MRB process, utilise reliability programmes. Such reliability programmes should be considered as a part of the approved AMP.

7. Alternative and/or additional instructions to those defined in EMAR M.A.302(d)1 and (2), proposed by the Operating Organisation/CAMO, may include but are not limited to the following:

- Escalation of the interval for certain tasks based on reliability data or other supporting information. [Appendix I to AMC M.A.302 and AMC M.B.301\(b\)](#) recommends that the AMP contains the corresponding escalation procedures. The escalation of these tasks is directly approved by the NMAA, including ALIs (Airworthiness Limitation Items).
- More restrictive intervals from those proposed by the (M)TCH as a result of the reliability data or because of a more stringent operational environment.
- Additional tasks at the discretion of the Operating Organisation/CAMO.

8. 'Field Evaluation' data from other military Operating Organisations using the same aircraft type in a similar manner may have been used to develop an initial AMP. However, where an aircraft has been procured from a foreign nation, security constraints or other nationally imposed limitations may result in a lack of complete data being available to support the AMP. In these cases, the Operating Organisation/CAMO should justify to the NMAA that the available data is sufficient to reduce any risks to As Low As Reasonably Practicable (ALARP).

AMC M.A.302(g) Aircraft Maintenance Programme (AMP)

RELIABILITY PROGRAMMES

1. Reliability programmes should be developed for AMPs based upon Maintenance Steering Group (MSG) logic (or equivalent) or those that include condition monitored components or that do not contain overhaul time periods for all significant system components.

2. NOT APPLICABLE.

3. The purpose of a reliability programme is to ensure that the AMP tasks are effective and their periodicity is adequate.
4. The reliability programme may result in the escalation or deletion of a maintenance task, as well as the de-escalation or addition of a maintenance task.
5. A reliability programme provides an appropriate means of monitoring the effectiveness of the AMP.
6. [Appendix I to AMC M.A.302 and M.B.301\(b\)](#) gives further guidance.

AMC M.A.304 Data for modifications and repairs

A maintenance organisation repairing an aircraft or component should assess the damage against published approved repair data and the action to be taken if the damage is beyond the limits or outside the scope of such data. This action could involve any one or more of the following options:

- the repair by replacement of the damaged parts;
- requesting technical support from the (M)TCH or an EMAR 21 Design Organisation or an organisation accepted by the NMAA;
- NMAA approval of the particular repair data.

GM M.A.304(d) Data for modifications and repairs

An 'organisation accepted by the NMAA' should be understood to mean an organisation which does not have an appropriate EMAR 21 approval, but nonetheless the NMAA possesses sufficient knowledge of the organisation's processes, procedures, quality system and, where appropriate, the regulatory system under which the organisation operates, to enable it to be considered as a legitimate provider of this information.

GM M.A.305 Aircraft continuing airworthiness record system

(a) The aircraft continuing airworthiness records are the means to assess the airworthiness status of a product and its components. An aircraft continuing airworthiness record system includes the processes to keep and manage those records and should be proportionate to the subject aircraft. Aircraft continuing airworthiness records should provide the CAMO of an aircraft with the information needed:

- (1) to demonstrate that the aircraft is in compliance with the applicable airworthiness requirements; and
- (2) to schedule all future maintenance as required by the AMP based, if any, on the last accomplishment of the specific maintenance as recorded in the aircraft continuing airworthiness records.

(b) 'Applicable airworthiness limitation parameter' and 'applicable parameter' refer to 'flight hours' and/or 'flight cycles' and/or 'landings' and/or 'calendar time', and/or any other applicable utilisation measurement unit, as appropriate.

(c) A 'life-limited part' is a part for which the maintenance schedule of the AMP requires the permanent removal from service when, or before, the specified mandatory life limitation in accordance with EMAR 21 if any of the applicable parameters is reached.

(d) The 'current status' when referring to components of life-limited parts should indicate, for each affected part, the life limitation, the total life accumulated in any applicable parameter (as appropriate) and the remaining life in any applicable parameter before the life limitation is reached.

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(e) The term 'time-controlled components' embraces any component for which the maintenance schedule of the AMP requires periodically the removal for maintenance to be performed in an appropriate approved maintenance organisation for components (workshop) to return the component to a specified standard, the replacement of sub-components of the assembly by new ones, or the inspection or test of component's performance, after a service period controlled at component level in accordance with the specified airworthiness limitation defined in accordance with EMAR 21, in any of the applicable parameters.

(f) The 'current status' when referring to time controlled components refers to the current status of compliance with the required periodic maintenance task(s) from the maintenance schedule of the AMP specific to the time-controlled components. It should include the life accumulated by the affected components in the applicable parameter, as appropriate, since the last accomplishment of scheduled maintenance specified in the maintenance schedule of the AMP. Any action that alters the periodicity of the maintenance task(s) or changes the parameter of this periodicity should be recorded.

(g) 'Detailed maintenance records' in this part refers to those records required to be kept by the organisation responsible for the aircraft continuing airworthiness in accordance with EMAR M.A.201 in order that it may be able to fulfil its obligations under EMAR M.

These are only a part of the detailed maintenance records required to be kept by a maintenance organisation under EMAR 145.A.55(c). Maintenance organisations are required to retain all detailed records to demonstrate that they worked in compliance with their respective requirements and quality procedures.

Not all records need to be transferred from the maintenance organisation to the organisation responsible for the aircraft continuing airworthiness in accordance with EMAR M.A.201 unless they specifically contain information relevant to aircraft configuration and future maintenance. Thus, incoming certificates of conformity, batch number references and individual task card sign-offs verified by and/or generated by the maintenance organisation are not required to be retained by the organisation responsible in accordance with EMAR M.A.201. However, dimensional information contained in the task card sign-off or work pack may be requested by the CAMO in order to verify and demonstrate the effectiveness of the AMP.

Information relevant to future maintenance may be contained in specific documents related to:

- modifications;
- Airworthiness Directives;
- repaired and non-repaired damage;
- components referred in EMAR M.A.305(d); and
- measurements relating to defects.

(h) An airworthiness limitation is a boundary beyond which an aircraft or a component thereof must not be operated, unless the instruction(s) associated with this airworthiness limitation is (are) complied with.

(i) 'Other maintenance required for continuing airworthiness' refers to unscheduled or out-of phase maintenance due to abnormal or particular conditions or events with an impact on the continuing airworthiness of the aircraft at the time of its return to service. It is not intended to request every single condition described in the maintenance data, e.g. Aircraft Maintenance Manual Chapter 5, but just those that cannot be captured by other means; for example, when they are not included in the records for repairs. Some abnormal or particular conditions or events that could be kept

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under this requirement could be lightning strikes, hard landings, longterm storage, propeller or rotor over-speed, over-torque, impact on a main rotor blade, etc.

(j) The term 'in-service history record' embraces records from which the current status of life-limited parts can be determined. The 'in-service history record' template could be adjusted to the relevant characteristics of the life-limited part, e.g. an engine disk being different from a fire extinguisher squib or landing gear sliding tube.

Such records document each time a life-limited part is placed in service or removed from service. They should clearly:

- (1) identify the part by its part number and serial number,
- (2) show the date of installation and removal (i.e. date on/date off),
- (3) show the details of the installation and removal (i.e. type, serial number, mass variant, thrust rating, as appropriate, of the aircraft, engine, engine module, or propeller) at installation and removal of the part when this is necessary to appropriately control the life limitation.
- (4) Show the total in-service life accumulated in any applicable parameter, as appropriate, corresponding to the dates of installation and removal of the part.

Any other events that would affect the life limitation, such as an embodied modification (in accordance with Airworthiness Directives, Service Bulletins or any product improvements) that affects the life limitation or changes the limitation parameter, should also be included in the in-service history record. Not all modifications would necessarily be pertinent to the life limitation of the component. Additionally, if a parameter is not relevant to the life of the part, then that parameter does not need to be recorded.

(k) The term 'permanently withdrawn from service' refers to moving the aircraft or component to a location that is not used for storage and/or future return to service.

(l) The term 'current status' refers to the data which accurately establishes the level of compliance of an aircraft, engine, propeller or component thereof, with a requirement. Each status should:

- (1) identify the aircraft, the engine, the propeller or the component it applies to;
- (2) be dated; and
- (3) include the relevant total in-service life accumulated in the applicable parameter on the date of the status.

AMC M.A.305(a) Aircraft continuing airworthiness record system

CERTIFICATE OF RELEASE TO SERVICE

(a) The inclusion of the Certificate of Release to Service (CRS) in the aircraft continuing airworthiness record system means that the date and/or any applicable parameter at which the maintenance was performed, including a unique reference to the CRS, should be processed in the record system.

(b) For components with airworthiness limitations, this information should be found on the authorised release certificate (EMAR Form 1 or equivalent). For life-limited parts, some relevant information required by EMAR M.A.305 may need to be introduced in the in-service history records.

AMC M.A.305(b)1 Aircraft continuing airworthiness record system**IN-SERVICE LIFE FOR ENGINES, PROPELLERS AND APU'S**

(a) Some gas turbine engines and propellers are assembled from modules and the total life accumulated in service for the complete engine or propeller may not be kept. When Operating Organisation/CAMO wish to take advantage of the modular design, then the total life accumulated in service for each module, as well as in-service history if applicable, and detailed maintenance records for each module, should be maintained. The continuing airworthiness records as specified should be kept with the module and should show compliance with any mandatory requirements pertaining to that module.

(b) The recording of in-service life accumulation may be necessary also in other measurement units to ensure the continuing airworthiness of the aircraft. For example, a mandatory life limitation measured in cycles of Auxiliary Power Unit (APU) usage may apply to some rotating parts. In such a case, APU cycles need to be recorded.

AMC M.A.305(c)1 Aircraft continuing airworthiness record system**AIRWORTHINESS DIRECTIVES**

(a) The current status of ADs, and measures mandated by the NMAA in immediate reaction to a safety problem, should identify the product/component, the applicable ADs including revision or amendment numbers and the date on which the status was updated. For the purpose of assessing the AD status, there is no need to list those ADs which are superseded or cancelled.

(b) If the AD is generally applicable to the aircraft or component type but is not applicable to the particular aircraft, engine, propeller or component, then this should be identified with the reason why it is not applicable.

(c) The current status of ADs should include the release to service date on which the AD or measure was accomplished (the date the CRS was issued), and where the AD or measure is controlled by flight hours and/or flight cycles and/or landings and/or any other applicable parameter, as appropriate, it should include the corresponding total life on that parameter accumulated in service on the date when the AD or measure was accomplished and/or the due limit in the appropriate parameter. For repetitive ADs or measures, only the last and next applications with the reference to the applicable parameter should be recorded in the current status.

(d) The status should also specify the method of compliance and which part of a multi-part AD or measure has been accomplished, where a choice is available in the AD or measure.

(e) The current status of AD should be sufficiently detailed to identify any loadable software aircraft part which is used for operating or controlling the aircraft.

(f) When the AD is multi-part or requests assessments of certain inspections, this information should be shown as well.

AMC M.A.305(c)2 Aircraft continuing airworthiness record system**MODIFICATIONS AND REPAIRS**

(a) Status of current modifications and repairs means a list compiled at aircraft level of modifications and repairs currently embodied. It should include the identification of the aircraft, engine(s) or propeller(s), as appropriate, and the date of the CRS when the modification or repair was accomplished. Where a modification or repair creates the need for the accomplishment of scheduled maintenance tasks, the reference to the applicable tasks should be added to the AMP.

The status should include the reference to the data in accordance with EMAR M.A.304 that provides the accomplishment procedure for the modification or repair. It should also specify which part of a multi-part modification or repair has been accomplished and the method of compliance, where a choice is available in the data.

(b) In addition to the previous applicable information, in respect to structure, the status of the current repairs should contain the description of the repair (e.g. doubler, blend, crack, dent, etc.), its location (e.g. reference to stringers, frames, etc.) and the dimensions. In the case of blend-out repairs, the remaining material should be recorded too.

(c) The status of modifications should be sufficiently detailed to identify any installed loadable software aircraft part used for operating or controlling the aircraft, the part number of which evolves independently of its associated aircraft hardware component, as identified in the maintenance data of the relevant design approval holders.

Other loadable software parts, such as navigational data bases or entertainment systems, are not considered under this recording requirement.

(d) For the purpose of this paragraph, a component replaced by a fully interchangeable alternate component is not considered a modification if this condition is published by the design approval holder.

(e) The status of modifications and repairs should include engine(s), propeller(s) and components subject to mandatory instructions and associated airworthiness limitations, and it is not intended that it should be retained for other components.

GM M.A.305(c)(2) Aircraft continuing airworthiness record system

IMPACT OF MODIFICATIONS AND REPAIRS

(a) The status of modifications and repairs may include the impact of a specific modification or repair in:

- (1) embodiment instructions;
- (2) mass and balance change data;
- (3) maintenance and repair manual supplements;
- (4) maintenance programme changes and Instructions for Continuing Airworthiness; and/or
- (5) aircraft flight manual supplements.

(b) When aircraft require a specific loadable software aircraft part configuration in order to operate correctly, a specific listing with this information may be necessary too.

AMC M.A.305(c)3 Aircraft continuing airworthiness record system

AIRCRAFT MAINTENANCE PROGRAMME

(a) The current status of compliance with the approved AMP means the last and next accomplishment data (referring to the applicable parameter) for the tasks specified in the maintenance schedule of the AMP. It should include:

- (1) an identifier specific enough to allow an easy and accurate identification of the task to be carried out, such as a task reference combined with a task title or short description of the work to be performed;

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(2) the engine, propeller or component identification when the task is controlled at engine, propeller, or component level; and

(3) the date when the task was accomplished (i.e. the date the CRS was issued) and for repetitive tasks when it is next due time, as well as when the terminating action is performed.

(b) Where the task is controlled by flight hours and/or flight cycles and/or landings and/or calendar time and/or any other applicable parameter, the total in-service life accumulated by the aircraft, engine, propeller or component (as appropriate) in the suitable parameter(s) should also be included.

GM M.A.305(d) Aircraft continuing airworthiness record system

LIFE-LIMITED PARTS AND TIME-CONTROLLED COMPONENTS

(a) A part is to be considered a life-limited part and a time-controlled component when it complies with both definitions given in paragraphs (c) and (e) of [GM M.A.305](#). For example, the maintenance schedule of the AMP may include both a mandatory permanent removal for a landing gear sliding tube and a periodic removal for overhaul of the landing gear (including the sliding tube).

(b) The following table provides a summary of the records' requirements related to life-limited parts and time-controlled components:

Maintenance task from the maintenance schedule of the AMP		Type of component	Continuing airworthiness records
Mandatory instructions (and associated airworthiness limitations) in accordance with EMAR 21 affecting a component	Permanent removal (replacement)	Life-limited part e.g.: engine HPT disc, landing gear sliding tube	– Current status (EMAR M.A.305(d)(1)); – In-service history record (EMAR M.A.305(e)(3)(i)); – EMAR Form 1 and detailed maintenance records for last scheduled maintenance and subsequent unscheduled maintenance (EMAR M.A.305(e)(3)(ii)); – EMAR Form 1 and detailed maintenance records for modifications and repairs (EMAR M.A.305(e)(2)(ii))
	Periodic removal for maintenance in an appropriate approved workshop, e.g.: – Overhaul of horizontal stabiliser actuator or of a landing gear	Time-controlled component e.g.: horizontal stabiliser actuator, landing gear gearbox	– Current status (EMAR M.A.305(d)(2)); – EMAR Form 1 and detailed maintenance records for last scheduled maintenance and subsequent unscheduled maintenance (EMAR M.A.305(e)(3)(ii)); and

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	– Replacement of a U-joint (of a gearbox)		– EMAR Form 1 and detailed maintenance records for modifications and repairs (EMAR M.A.305(e)(2)(ii)).
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GM M.A.305(d)(2) Aircraft continuing airworthiness record system

TASKS CONTROLLED AT COMPONENT LEVEL

(a) The maintenance schedule of the AMP may include tasks controlled at component level coming from a mandatory requirement in accordance with EMAR 21 and to be performed in a workshop, such as:

- (1) the removal of a component for periodic restoration to return the component to a specified standard (e.g. removal of the landing gear for overhaul);
- (2) the periodic removal of a component for replacement of a sub-component by a new one when it is not possible to restore the item to a specific standard of failure resistance (e.g. discarding of universal joints of a gearbox, batteries of the escape slide/raft, discharge cartridges of fire extinguishers, etc.); and
- (3) a periodic inspection or test to confirm that a component meets specified performance standards (e.g. functional check of the portable emergency locator transmitter, etc.). The component is left in service (no further maintenance action taken) on the condition that it continues to fulfil its intended purpose within specified performance limits until the next scheduled inspection.

The above tasks apply to 'time-controlled components' as defined in paragraph (e) of [GM M.A.305](#). If a component affected by a task in accordance with points (2) and (3) above is controlled at aircraft level by the AMP and it has not been removed since the task was last accomplished, then its status of compliance with EMAR M.A.305(d)2 is already demonstrated by the aircraft records.

Note: The maintenance in accordance:

- with points (1) and (2) above assumes a predictable deterioration of the component: the overall reliability invariably decreases with age; and
- with point (3) assumes a gradual deterioration of the component: failure resistance can reduce and drop below a defined level.

(b) When a component is affected by a maintenance task of the AMP and controlled at component level, and such component does not qualify as a time-controlled component, the status of the component may nevertheless be needed, in order to show that all the maintenance due on the aircraft according to the AMP has been carried out. There is no specific requirement to keep the EMAR Form 1 or any other detailed maintenance records.

(c) For AMPs developed under a primary maintenance process-oriented methodology (e.g. Maintenance Steering Group), the term 'time-controlled component' pertains to 'Hard Time' and 'On-Condition'. The primary maintenance processes are:

(1) Hard Time

This is a preventive process in which known deterioration of a component is limited to an acceptable level by the maintenance actions which are carried out at periods related to time in service (e.g. calendar time, number of cycles, number of landings). The prescribed actions restore the component utility margin to the applicable time limitation.

(2) On-Condition

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It is a preventive process in which the component is inspected or tested, at specified periods, to an appropriate standard in order to determine whether it can continue in service. The purpose is to remove the component before its failure in service.

(3) Condition Monitoring

This is a process in which a parameter of a condition in a component (vibration, temperature, oil consumption, etc.) is monitored to identify the development of a fault.

The purpose is to remove the component before its failure in service (e.g. due to related repair costs), but they are permitted to remain in service without preventive maintenance until a functional failure occurs.

Note: For components that are not subject to any of these primary maintenance processes, corrective maintenance is carried out after failure detection and is aimed at restoring components to a condition in which they can perform their intended function ('fly-to failure').

(d) The following table provides a summary of the records' requirements related to components subjected to primary maintenance process, including components without an EMAR Form 1 in accordance with EMAR 21.A.307:

	Primary maintenance process	Continuing airworthiness records
Life-limited part		– Current status (EMAR M.A.305(d)(1)); – In-service history record (EMAR M.A.305(e)(3)(i)); – EMAR Form 1 and detailed maintenance records for last scheduled maintenance and subsequent unscheduled maintenance (EMAR M.A.305(e)(3)(ii)), including modifications and repairs (EMAR M.A.305(e)(2)(ii)).
Time-controlled component	Hard time	– Current status (EMAR M.A.305(d)(2)); – EMAR Form 1 and detailed maintenance records for last scheduled maintenance and subsequent unscheduled maintenance (EMAR M.A.305(e)(3)(ii)), including modifications and repairs (EMAR M.A.305(e)(2)(ii)).
	On condition	– Current status (EMAR M.A.305(d)(2)); and – EMAR Form 1 and detailed maintenance records for last scheduled maintenance and subsequent unscheduled maintenance (EMAR M.A.305(e)(3)(ii)) If the task is controlled at aircraft level, the above information could be already contained in the records related to the AMP (EMAR M.A.305(c)(3) and EMAR M.A.305(e)(2)(iii)). If the maintenance was performed off wing, the EMAR Form 1 needs to be kept.

Condition monitoring	The EMAR Form 1 does not need to be kept unless this is the means to fulfil another requirement; for example, an AD compliance.
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AMC M.A.305(e) Aircraft continuing airworthiness record system

INFORMATION TECHNOLOGY (IT) SYSTEMS AND FORM OF RECORDS

(a) The information that constitutes the aircraft continuing airworthiness records may be entered in an Information Technology (IT) system and/or documents equivalent in scope and detail.

IT systems acceptable for supporting the aircraft continuing airworthiness records should:

- (1) include functions so that search of data and production of status is possible;
- (2) allow a transfer of the aircraft continuing airworthiness records data from one system to another using an industry-wide/worldwide data format or allow printing information;
- (3) contain safeguards which prevent unauthorised personnel from altering data; and
- (4) ensure the integrity of the data, including traceability of amendments.

(b) 'Data equivalent in scope and detail' are included in the airworthiness record system and could be an aircraft logbook, engine logbook(s) or engine module log cards, propeller logbook(s) and log cards for life-limited parts.

Any logbook/log card should contain:

- (1) identification of the product or component it refers to;
- (2) type, part number, serial number and registration, as appropriate, of the aircraft, engine, propeller, engine module, or component to which the component has been fitted in, along with the reference to the installation and removal;
- (3) the date and the corresponding total in-service life accumulated in any applicable parameter unit, as appropriate; and
- (4) any AD, modification, repair, maintenance or deferred maintenance tasks applicable.

When fulfilling the applicable requirements, a logbook/log card as described above could be a means to comply with the current status and the in-service history record for each life-limited part.

(c) Form of records

Producing and/or keeping continuing airworthiness records in a form acceptable to the NMAA normally means in either material/physical or electronic state, or a combination of both.

Retention of records should be done in one of the following formats:

- (1) original paper document or electronic data (via an approved electronically signed form);
- (2) a paper reproduction of a paper document (original or copy); or
- (3) an electronic reproduction of electronic data (original or copy); or
- (4) a printed reproduction of electronic data (original or copy); or
- (5) an electronically digitised reproduction of a paper document (original or copy); or
- (6) a microfilm or scanned reproduction copy of a paper document (original or copy).

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Where IT systems are used to retain documents and data, it should be possible to print a paper version of the documents and data kept.

(d) Physical (non-digitised) records

All physical records should remain legible throughout the required retention period. Physical records on either paper or microfilm systems should use robust material, which can withstand normal handling, filing and ageing. They should be stored in a safe way with regard to damage, alteration and theft.

(e) Digitised records

Digitised records may be created from a paper document (original or copy) or from electronic data.

When created from a paper document:

- (1) the creation date of the digitised record should be stored with the digitised record;
- (2) it is advisable to create an individual digitised record for each document;
- (3) if an organisation creates a large number of digitised records, the use of database technology should ease the future retrieval of the record; and
- (4) digitised records should be legible, including details such as, but not limited to, the date of signature, names, stamps, notes, or drawings.

(f) Digitised record retention

Digitised records when created from an original paper record, or as a digital electronic original, should be stored on a system which is secured and kept in an environment protected from damage (e.g. fire, flooding, excessive temperature or accidental erasing). IT systems should have at least one backup system, which should be updated at least within 24 hours of any entry in the primary system. Access to both primary and backup systems is required to be protected against the ability of unauthorised personnel to alter the database and they should preferably be located remotely from the main system.

The system used for retention of digitised records should:

- (1) ensure the integrity, accuracy and completeness of the record;
- (2) ensure that access to the digitised record has safeguards against alteration of the data;
- (3) ensure the authenticity of the record including assurance that the date has not been modified after creation;
- (4) be capable of retrieving individual records within a reasonable time period; and
- (5) be maintained against technological obsolescence which would prevent printing, displaying or retrieval of the digitised records.

Computer backup discs, tapes etc. should be stored in a different location from that containing the current working discs, tapes, etc. and in a safe environment.

Where the NMAA has accepted a system for digitised record-keeping satisfying the above, the paper document may be permanently disposed of.

(g) Lost or destroyed records

Reconstruction of lost or destroyed records can be done by reference to other records which reflect the time in service, research of records maintained by maintenance organisations, etc. When reconstruction has been done and the record is still incomplete, the Operating

Organisation/CAMO may make a statement in the new record describing the loss and establishing the time in service based on the research and the best estimate of time in service. The reconstructed records should be submitted to the NMAA for acceptance. The NMAA may require the performance of additional maintenance if not satisfied with the reconstructed records.

AMC M.A.305(e)(1) Aircraft continuing airworthiness record system

This retention period of 36 months could be extended in the case of an entry in the technical log system requiring an additional period of retention as defined in EMAR M.

AMC M.A.305(e)(2) Aircraft continuing airworthiness record system

(a) EMAR Form 1 and the Certificate of Conformity of the components used to perform a modification/repair are not part of the substantiation data for a modification/repair. These certificates are retained by the maintenance organisation.

(b) In the case of an AD with several steps or with intermediate assessments during its application, these intermediate steps should be part of the detailed maintenance records.

GM M.A.305(e)(2) Aircraft continuing airworthiness record system

‘Until such time as the information contained therein is superseded by new information equivalent in scope and detail but not shorter than 36 months’ means that during a maximum of 36 months the information and the one superseding it will be kept but, after these 36 months, only the new information must be kept.

For example, for a maintenance task with an interval shorter than 36 months, more than one set of information equivalent in scope and detail should be retained. If the maintenance task interval is longer than 36 months, the last set of information equivalent in scope and detail is retained.

AMC M.A.305(e)(3) Aircraft continuing airworthiness record system

(a) An EMAR Form 1 and detailed maintenance records are not required to be kept to support every installation/removal shown in the in-service history records.

(b) Conservative methods to manage missing historical periods are acceptable to establish the current status of the life-limited part. In case of use of a conservative method, the supporting documents should be endorsed. Recommendations from the design approval holder on the procedures to record or reconstruct the in-service history should be considered.

GM M.A.305(e)(3) Aircraft continuing airworthiness record system

(a) EMAR Form 1 is not required to be kept for the ‘condition monitoring’ process of components unless this is the means to fulfil another requirement quoted in EMAR M.A.305 (e.g. demonstration of AD compliance).

(b) For components that are not subject to any of the primary maintenance processes described in the [GM M.A.305\(d\)\(2\)](#) (i.e. Hard Time, On-Condition, Condition Monitoring), the EMAR Form 1 is not required to be kept.

AMC M.A.305(f) Aircraft continuing airworthiness record system

When the Operating Organisation/CAMO arranges for the relevant maintenance organisation to retain copies of the continuing airworthiness records on their behalf, the Operating Organisation/CAMO will continue to be responsible for the retention of records. If they cease to

be the Operating Organisation/CAMO of the aircraft, they also remain responsible for transferring the records to the new Operating Organisation/CAMO.

AMC M.A.306(a) Aircraft technical log system

CONTENT OF INFORMATION ON THE AIRCRAFT TECHNICAL LOG (ATL) SYSTEM

The aircraft technical log is a system for recording defects and malfunctions during the aircraft operation and for recording details of all maintenance carried out on an aircraft between scheduled base maintenance visits. In addition, it is used for recording flight safety and maintenance information the operating crew need to know.

Cabin, galley or operational equipment defects and malfunctions that affect the safe operation of the aircraft or the safety of its occupants are regarded as forming part of the aircraft logbook where recorded by another means.

Where an NMAA has promulgated instructions on the format and construct of an aircraft technical log, this format should be used by all organisations and personnel engaged in the maintenance and support of military registered aircraft and airborne equipment. These instructions should provide a description of the format and use of military aviation engineering documentation, together with any associated procedures.

GM M.A.306(a) Aircraft technical log system

The aircraft technical log system may range from a simple single section document to a complex system containing many sections but it should include the information specified for the example used here which happens to use a 5 section document / computer system:

Section 1 should contain details of the Operating Organisation, the aircraft type and the complete registration marks of the aircraft.

Section 2 should contain details of when the next scheduled maintenance is due, including, if relevant any out of phase component changes due before the next maintenance check. In addition this section should contain the current CRS for the complete aircraft, issued at the end of the last maintenance check.

NOTE: The flight crew do not need to receive such details if the next scheduled maintenance is controlled by other means acceptable to the NMAA.

Section 3 should contain details of all information considered necessary to ensure continued flight safety. Such information includes:

- (i) the aircraft type and registration mark,
- (ii) the date and place of take-off and landing,
- (iii) the times at which the aircraft took off and landed,
- (iv) the running total of flying hours, such that the hours to the next schedule maintenance can be determined. The flight crew does not need to receive such details if the next scheduled maintenance is controlled by other means acceptable to the NMAA.
- (v) details of any failure, defect or malfunction to the aircraft affecting airworthiness or safe operation of the aircraft including emergency systems, and any failure, defect or malfunctions in the cabin, galleys or operational equipment that affect the safe operation of the aircraft or the safety of its occupants that are known to the aircraft commander. Provision should be made for the aircraft commander to date and sign such entries including, where appropriate, the nil defect state for continuity of the record.

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Provision should be made for a CRS following rectification of a defect or any deferred defect or maintenance check carried out. Such a certificate appearing on each page of this section should readily identify the defect(s) to which it relates or the particular maintenance check as appropriate.

In the case of maintenance performed by an EMAR 145 maintenance organisation, it is acceptable to use an alternate abbreviated CRS consisting of the statement 'EMAR 145 release to service' instead of the full certification statement specified in AMC 145.A.50(b) paragraph 1. When the alternate abbreviated CRS is used, the introductory section of the technical log should include an example of the full certification statement from AMC 145.A.50(b) paragraph 1.

(vi) the quantity of fuel and oil uplifted and the quantity of fuel available in each tank, or combination of tanks, at the beginning and end of each flight; provision to show, in the same units of quantity, both the amount of fuel planned to be uplifted and the amount of fuel actually uplifted; provision for the time when ground de-icing and/or anti-icing was started and the type of fluid applied, including mixture ratio fluid/water and any other information required by the Operating Organisation's procedures in order to allow the assessment on whether inspections for and/or elimination of de-icing/anti-icing fluid residues that could endanger flight safety are required.

(vii) the pre-flight inspection signature.

In addition to the above, it may be necessary to record supplementary information such as:

- the time spent in particular engine power ranges where use of such engine power affects the life of the engine or engine module;
- the number of landings where landings affect the life of an aircraft or aircraft component;
- flight cycles or flight pressure cycles where such cycles affect the life of an aircraft or aircraft component.

NOTE 1: Where Section 3 is of the multi-sector 'part removable' type, then such 'part removable' sections should contain all of the foregoing information where appropriate.

NOTE 2: Section 3 should be designed so that one copy of each page may remain on the aircraft and one copy may be retained on the ground until completion of the flight to which it relates.

NOTE 3: Section 3 layout should be divided to show clearly what is required to be completed after flight and what is required to be completed in preparation for the next flight.

Section 4 should contain details of all deferred defects that affect or may affect the safe operation of the aircraft and should therefore be known to the aircraft commander. Each page of this section should be pre-printed with the Operating Organisation's name and page serial number and make provision for recording the following:

(i) a cross reference for each deferred defect such that the original defect can be identified in the particular section 3 sector record page.

(ii) the original date of occurrence of the defect deferred.

(iii) brief details of the defect.

(iv) details of the eventual rectification carried out and its CRS or a clear cross-reference back to the document that contains details of the eventual rectification.

Section 5 should contain any necessary maintenance support information that the aircraft commander needs to know. Such information would include data on how to contact maintenance organisation if problems arise whilst operating the routes etc.

AMC M.A.306(b) Aircraft technical log system

The aircraft technical log system can be either a paper or computer system or any combination of both methods acceptable to the NMAA.

In case of a computer system, it should contain program safeguards against the ability of unauthorised personnel to alter the database.

AMC M.A.307(a) Transfer of aircraft continuing airworthiness records

Where an Operating Organisation/CAMO terminates its operation, all retained continuing airworthiness records should be passed on to the new Operating Organisation/CAMO or stored.

A 'permanent transfer' does not generally include the leasing of an aircraft when the duration of the lease agreement is less than 6 months. However the NMAA should be satisfied that all continuing airworthiness records necessary for the duration of the lease agreement are transferred to the lessee or made accessible to them.

SUBPART D - MAINTENANCE STANDARDS

AMC M.A.401(b) Maintenance data

Refer to AMC & GM to EMAR 145.A.45.

GM1 M.A.401(b)(3) and (b)(4) Maintenance data

Refer to AMC & GM to EMAR 145.A.45.

GM1 M.A.401(b)(4) Maintenance data

Refer to AMC & GM to EMAR 145.A.45.

AMC M.A.401(c) Maintenance data

Refer to AMC & GM to EMAR 145.A.45.

AMC M.A.402(a) Performance of maintenance

NOT APPLICABLE.

GM M.A.402(a) Performance of maintenance

NOT APPLICABLE.

AMC M.A.402(c) Performance of maintenance

NOT APPLICABLE.

AMC M.A.402(d) Performance of maintenance

NOT APPLICABLE.

AMC M.A.402(e) Performance of maintenance

NOT APPLICABLE.

AMC M.A.402(f) Performance of maintenance

NOT APPLICABLE.

AMC M.A.402(g) Performance of maintenance

NOT APPLICABLE.

AMC1 M.A.402(h) Performance of maintenance

NOT APPLICABLE.

AMC2 M.A.402(h) Performance of maintenance

NOT APPLICABLE.

GM M.A.402(h) Performance of maintenance

NOT APPLICABLE.

AMC M.A.403(b) Aircraft defects

An assessment of both the cause and any potentially hazardous effect of any defect or combination of defects that could affect flight safety should be made in order to initiate any necessary further investigation and analysis necessary to identify the root cause of the defect.

AMC M.A.403(d) Aircraft defects

All deferred defects should be made known to the pilot/flight crew, whenever possible, prior to their arrival at the aircraft. Deferred defects should be transferred on to worksheets at the next appropriate maintenance check, and any deferred defect which is not rectified during the maintenance check, should be re-entered on to a new deferred defect record sheet. The original date of the defect should be retained. The necessary components or parts needed for the rectification of defects should be made available or ordered on a priority basis and fitted at the earliest opportunity.

SUBPART E - COMPONENTS

AMC1 M.A.501(a)(1) Classification and installation

EMAR FORM 1 OR EQUIVALENT

(a) A document equivalent to an EMAR Form 1 may be:

(1) NOT APPLICABLE;

(2) NOT APPLICABLE;

(3) NOT APPLICABLE;

(4) in the case of new aircraft components that were released from manufacturing prior to the EMAR 21 implementation date, the component should be accompanied by a release document accepted by the NMAA;

(5) NOT APPLICABLE;

(6) in the case of aircraft components that were released from maintenance prior to the EMAR 145 implementation date, the component should be accompanied by a release document accepted by the NMAA;

(7) NOT APPLICABLE;

(8) NOT APPLICABLE;

(9) NOT APPLICABLE;

(10) An EASA Form 1 (if accepted by the NMAA, and not originating from an EASA Part M Subpart F approved organisation).

(11) A national equivalent document recognized by the NMAA as declaring an item's serviceability and airworthiness.

(12) a release document issued by an organisation accepted by the NMAA.

(b) Any component in storage without an EMAR Form 1 or equivalent cannot be installed on aircraft unless an EMAR Form 1 is issued for such component by an appropriately approved maintenance organisation (refer to AMC2 145.A.50(d)).

GM1 M.A.501(a)(1) Classification and installation

EMAR 21.A.307 specifies new components that do not need an EMAR Form 1 to be eligible for installation and specifies the conditions for the document accompanying the component.

GM1 M.A.501(a)(2) Classification and installation

UNSERVICEABLE COMPONENTS

(a) Refer to AMC 145.A.42(a)2.

(b) Unserviceable components should typically undergo maintenance due to:

(1) expiry of the service life limit as defined in the AMP;

(2) non-compliance with the applicable ADs and other continuing airworthiness requirements mandated by the NMAA;

- (3) absence of the necessary information to determine the airworthiness status or eligibility for installation;
- (4) evidence of defects or malfunctions;
- (5) being installed on an aircraft that was involved in an incident or accident likely to affect the component's serviceability.

AMC1 M.A.501(a)(3) Classification and installation

UNSALVAGEABLE COMPONENTS

Refer to AMC 145.A.42(d).

AMC1 M.A.501(a)(4) Classification and installation

STANDARD PARTS

Refer to AMC 145.A.42(a)4.

AMC2 M.A.501(a)(4) Classification and installation

STANDARD PARTS

Refer to AMC 145.A.42(a)4.

AMC M.A.501(a)(5) Classification and installation

MATERIAL

Refer to AMC 145.A.42(a)5.

GM1 M.A.501(b) Classification and installation

(a) To ensure that components, standard parts and materials are in satisfactory condition, the approved maintenance organisation should perform an incoming physical inspection.

(b) The incoming physical inspection should be performed before the component is installed on the aircraft.

(c) The following list, although not exhaustive, contains typical checks to be performed:

- (1) verify the general condition of the components and their packaging in relation to damages that could affect their integrity;
- (2) verify that the shelf life of the component has not expired;
- (3) verify that items are received in the appropriate package in respect of the type of the component: e.g. correct ATA 300 or electrostatic sensitive devices packaging, when necessary;
- (4) verify that the component has all plugs and caps appropriately installed to prevent damage or internal contamination. Care should be taken when tape is used to cover electrical connections or fluid fittings/openings because adhesive residues can insulate electrical connections and contaminate hydraulic or fuel units.
- (5) verify that the release certificate accompanying each new component satisfies the release requirements established in EMAR 21.A.307 as applicable in relation to the particular product on which the component is being installed.

(d) Items (e.g. fasteners) purchased in batches should be supplied in a package. The packaging should state the applicable specification/standard, P/N, batch number, and the quantity of the items. The documentation that accompanies the material should contain the applicable specification/standard, P/N, batch number, supplied quantity, and the manufacturing sources.

If the material is acquired from different batches, acceptance documentation for each batch should be provided.

GM2 M.A.501(b) Classification and installation

INSTALLATION OF COMPONENTS

Components, standard parts and materials should only be installed when they are specified in the applicable maintenance data. This could include illustrated parts catalogue (IPC), Service Bulletins (SBs), Aircraft Maintenance Manual (AMM), Component Maintenance Manual (CMM), etc. So, a component, standard part and material can only be installed after having checked the applicable maintenance data. This check should ensure that the part number, modification status, limitations, etc., of the component, standard part or material are the ones specified in the applicable maintenance data of the particular aircraft or component (i.e. IPC, SB, AMM, CMM, etc.) where the component, standard part or material is going to be installed.

Components, standard parts and materials should only be installed when they are specified in the applicable maintenance data as specified in EMAR 145.A.45. So, a component, standard part and material can only be installed after having checked the applicable maintenance data.

This check should ensure that the part number, modification status, limitations, etc. of the component, standard part or material are the ones specified in the applicable maintenance data of the particular aircraft or component where the component, standard part or material is going to be installed.

AMC M.A.502 Component maintenance

Component removal from and installation on an aircraft is considered to be aircraft maintenance and not component maintenance. As a consequence, EMAR M.A.502 requirements do not apply to this case.

AMC M.A.502(b) and (c) Component maintenance

EMAR M.A.502(b) and (c) allow the performance of certain component maintenance, in accordance with component maintenance data, to maintenance organisations not holding the corresponding B/C rating, subject to the agreement of the NMAA responsible for the oversight of the maintenance organisation.

This should only be permitted by the NMAA in the case of simple component maintenance, where the NMAA is satisfied that the certifying staff are appropriately qualified and the proper tooling and facilities are available. It is important to note that for more complex component maintenance, special qualifications may be required and it is not enough with holding an EMAR 66 aircraft maintenance licence.

GM1 M.A.502(e) Component maintenance

NOT APPLICABLE.

AMC1 M.A.504 Segregation of components

(a) Unserviceable components should be identified and stored in a separate secure location that is managed by the maintenance organisation until a decision is made on the future status of such components.

Nevertheless, the organisation that declared the component unserviceable may transfer its custody, after identifying it as unserviceable, to the component owner or Operating Organisation/CAMO provided that such transfer is reflected in the aircraft logbook, or engine logbook, or component logbook.

(b) 'Secure location under the control of an approved maintenance organisation' refers to a location that is managed by the approved maintenance organisation that prevents the component from being reused or tampered with. This may include facilities that are established by the organisation at locations different from the main maintenance facilities. These locations should be identified in the relevant procedures of the organisation.

(c) In the case of unsalvageable components, the organisation should:

- (1) retain such components in the secure location referred to in paragraph (b);
- (2) arrange for the component to be mutilated in a manner that ensures that it cannot be restored for use, before disposing it; or
- (3) mark the component indicating that it is unsalvageable, when, in agreement with the component owner, the component is disposed of for legitimate non-flight uses (such as training and education aids, research and development), or for non-aviation applications, mutilation is often not appropriate. Alternatively to marking, the original part number or data plate information can be removed, or a record kept of the disposal of the component for legitimate non-flight uses.

GM1 M.A.504 Segregation of components**MUTILATION OF COMPONENTS**

(a) Mutilation should be accomplished in such a manner that the components become permanently unusable for their originally intended use. Mutilated components should not be able to be reworked or camouflaged to provide the appearance of being serviceable, such as by replating, shortening and rethreading long bolts, welding, straightening, machining, cleaning, polishing, or repainting.

(b) Mutilation may be accomplished by one or a combination of the following procedures:

- (1) grinding;
- (2) burning;
- (3) removal of a major lug or other integral feature;
- (4) permanent distortion of parts;
- (5) cutting a hole with cutting torch or saw;
- (6) melting;
- (7) sawing into many small pieces; and
- (8) any other method accepted by the NMAA.

(c) The following procedures are examples of mutilation that are often less successful because they may not be consistently effective:

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- (1) stamping or vibro-etching;
- (2) spraying with paint;
- (3) small distortions, incisions, or hammer marks;
- (4) identification by tags or markings;
- (5) drilling small holes; and
- (6) sawing in two pieces only.

SUBPART F - MAINTENANCE ORGANISATION

NOT APPLICABLE.

SUBPART G - CONTINUING AIRWORTHINESS MANAGEMENT ORGANISATION

NOT APPLICABLE.

SUBPART H - CERTIFICATE OF RELEASE TO SERVICE — CRS

NOT APPLICABLE.

SUBPART I - MILITARY AIRWORTHINESS REVIEW CERTIFICATE (MARC)

AMC M.A.901 Aircraft airworthiness review

In order to ensure the validity of the aircraft airworthiness certificate, EMAR M.A.901 requires performing periodically an airworthiness review of the aircraft and its continuing airworthiness records, which results in the issuance of a MARC valid for one year.

GM M.A.901 Airworthiness review

Responsibilities of Airworthiness Review Staff (ARS):

The following is a summary of the requirements contained in EMAR M.A.901 as well as the associated AMC and Appendices, in relation to the responsibilities of the ARS:

- ARS are responsible for performing both the document and the physical survey.
- Procedures must be established by the CAMO in order to perform the airworthiness review, including the depth of samplings.
- Procedures must make very clear that the final word about the depth of the inspections (both document and physical) belongs to the ARS, who can go beyond the depth established in the CAME if they find it necessary. At the end, it is the responsibility of the ARS to be satisfied that the aircraft complies with EMAR M and is airworthy, and the organisation must ensure that no pressure or restrictions are imposed on the ARS when performing their duty.
- A compliance report must be produced by the ARS, detailing all items checked and the outcome of the review.
- ARS are responsible for the items checked during the airworthiness review. However, they do not take over the responsibilities of the CAMO, maintenance organisation, DOA, POA or any other organisations, not being responsible for problems not detected during the airworthiness review or for the possibility that the approved or declared maintenance programme may not include certain recommendations from the design approval holder. Obviously, if the ARS are not independent of the airworthiness management process and were nominated on the basis of the option of having overall authority on such a process, they will be responsible for the full continuing airworthiness of such aircraft.
- Nevertheless, this responsibility will be a consequence of their position in the organisation and not of their function as ARS.
- The issuance of the MARC by the ARS only certifies that the aircraft is considered airworthy in relation to the scope of the airworthiness review performed and the fact that the ARS are not aware of instances of non-compliance which endanger flight safety. Furthermore, it only certifies that the aircraft is considered airworthy at the time of the review.

It is the responsibility of the Operating Organisation/CAMO to ensure that the aircraft is fully airworthy at any time.

GM M.A.901(a) Aircraft airworthiness review

EMAR Form 15a is issued by the NMAA while EMAR Form 15b is issued by a CAMO.

AMC M.A.901(b) Aircraft airworthiness review

1. If the continuing airworthiness of the aircraft is not managed according to an EMAR M Appendix I Continuing airworthiness management contract, the aircraft should be considered to be outside a controlled environment. Nevertheless, such contract is not necessary when the Operating Organisation and the CAMO are the same organisation.

2. NOT APPLICABLE.

AMC M.A.901(c)2, (e)2 and (f) Aircraft airworthiness review

When the aircraft has remained within a controlled environment, the extension of the validity of the MARC does not require an airworthiness review but only a verification of the continuous compliance with EMAR M.A.901(b).

It is acceptable to anticipate the extension of the MARC by a maximum of 30 days without a loss of continuity of the airworthiness review pattern, which means that the new expiration date is set up one year after the previous expiration date. This anticipation of up to 30 days also applies to the 12 month requirements shown in EMAR M.A.901(b), meaning that the aircraft is still considered as being in a controlled environment if it has been continuously managed by an organisation and maintained by appropriately approved organisations, as stated in EMAR M.A.901(b), from the date when the last MARC was issued until the date when the extension is performed (this can be up to 30 days less than 12 months).

It is also acceptable to perform the extension of a MARC after its expiration date, as long as all the conditions for the extension are met. However, this means the following:

- The aircraft could not fly since the MARC expired until it is extended, and
- The new expiration date (after extension) is set one year after the previous expiration date (not one year after the extension is performed).

AMC M.A.901(d) Aircraft airworthiness review

The recommendation sent by a CAMO to the NMAA should contain at least the items described below:

(a) General information

- CAMO information;
- Operating Organisation information;
- date and place the document review and the aircraft survey were carried out;
- period and place the aircraft can be seen if required by the NMAA.

(b) Aircraft information

- registration;
- type;
- manufacturer;
- serial number;
- Aircraft Flight Manual reference;
- mass and centre of gravity data;
- AMP reference;

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- symmetry check data (if applicable).

(c) Documents accompanying the recommendation

- copy of registration papers
- copy of the Operating Organisation/CAMO's request for a new MARC.

(d) Aircraft status

- aircraft total flight hours and cycles or other service life consumption units if applicable;
- list of organisations having carried out continuing airworthiness activities including maintenance tasks on the aircraft and its components since the last MARC was issued.

(e) Aircraft survey

- a precise list of the areas of the aircraft that were surveyed and their status.

(f) Findings

- a list of all the findings made during the airworthiness review with the corrective actions carried out

(g) Statement

A statement signed by the ARS recommending the issue of a MARC.

The statement should confirm that the aircraft in its current configuration complies with the following:

- Airworthiness Directives up to the latest published issue;
- (Military) Type Certificate datasheet;
- AMP;
- limitation for life-limited parts and time-controlled components;
- the valid mass and centre of gravity schedule reflecting the current configuration of the aircraft;
- EMAR 21 for all modifications and repairs;
- the current Aircraft Flight Manual including supplements;
- valid symmetry check schedule (if applicable);
- operational requirements.

The above items should clearly state the exact reference of the data used in establishing compliance; for instance the number and issue of the (M)TC data sheet used should be stated.

The statement should also confirm that all of the above is properly entered and certified in the aircraft continuing airworthiness record system and/or in the aircraft technical log.

AMC M.A.901(i) Aircraft airworthiness review

Suitable accommodation should include:

(a) an office with normal office equipment such as desks, telephones, photocopying machines etc. whereby the continuing airworthiness records can be reviewed.

(b) a hangar when needed for the physical survey.

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The support of personnel appropriately qualified in accordance with EMAR 66 is necessary when the NMAA's ARS is not appropriately qualified.

AMC M.A.901(k) Aircraft airworthiness review

FULL DOCUMENTED REVIEW

1. A full documented review is a check of at least the following categories of documents:

- registration papers;
- EMAR M.A.305 aircraft continuing airworthiness record system;
- EMAR M.A.306 aircraft technical log system;
- list of deferred defects, Minimum Equipment List and Configuration Deviation List if applicable;
- Aircraft Flight Manual including aircraft configuration;
- Aircraft Maintenance Programme;
- maintenance data;
- relevant work packages;
- AD status;
- modification and SB status;
- modification and repair approval sheets;
- status of life-limited parts and time-controlled components;
- relevant EMAR Form 1 or equivalent;
- mass and balance report and equipment list;
- aircraft, engine and propeller (M)TC data sheets;
- symmetry check status if applicable.

As a minimum, sample checks within each document category should be carried out.

2. The CAMO should develop procedures for the ARS to produce a compliance report that confirms the above have been reviewed and found in compliance with EMAR M.

AMC M.A.901(l) and (m) Aircraft airworthiness review

PHYSICAL SURVEY

1. The physical survey could require actions categorised as maintenance (e.g. operational tests, tests of emergency equipment, visual inspections requiring panel opening, etc.). In this case, after the airworthiness review, a release to service should be issued.

2. When the ARS are not appropriately qualified as per EMAR 66 in order to release such maintenance, EMAR M.A.901(l) requires them to be assisted by such qualified personnel.

However, the function of such EMAR 66 personnel is limited to performing and releasing the maintenance actions requested by the ARS, not being their function to perform the physical survey of the aircraft.

3. This means that the ARS who is going to sign the MARC or the recommendation should be the one performing both the documented review and the physical survey of the aircraft. It is not the

intent of the rule to delegate the survey to EMAR 66 personnel who are not ARS. Furthermore, the provision of EMAR M.A.901(n) that allows a 90-day anticipation for the physical survey provides enough flexibility to ensure that the ARS are present.

4. The physical survey may include verifications to be carried out during flight.
5. The CAMO should develop procedures for the ARS to produce a compliance report that confirms that the physical survey has been carried out and found satisfactory.
6. To ensure compliance, the physical survey may include relevant sample checks of items.

AMC M.A.901(n) Aircraft airworthiness review

'Without loss of continuity of the airworthiness review pattern' means that the new expiration date is set up 1 year after the previous expiration date. As a consequence, when the airworthiness review is anticipated, the validity of the MARC is longer than 1 year (up to 90 days longer).

This anticipation of up to 90 days also applies to the 12-month requirements shown in EMAR M.A.901(b), which means that the aircraft is still considered as being in a controlled environment if it has been continuously managed by an organisation and maintained by appropriately approved organisations, as stated in EMAR M.A.901(b), from the date when the last MARC was issued until the date when the new airworthiness review is performed (this can be up to 90 days less than 12 months).

AMC M.A.901(o) Airworthiness review

A copy of both the physical survey and document review compliance reports stated above should be sent to the NMAA together with any recommendation issued.

AMC M.A.903(a)1 Transfer of aircraft registration within the EU

TO BE ADDED LATER IF REQUIRED.

AMC M.A.903(b) Transfer of aircraft registration within the EU

TO BE ADDED LATER IF REQUIRED.

AMC M.A.904 (a)1 Airworthiness review of aircraft imported into the EU

TO BE ADDED LATER IF REQUIRED.

AMC M.A.904(a)2 Airworthiness reviews of aircraft imported into the EU

TO BE ADDED LATER IF REQUIRED.

AMC M.A.904(b) Airworthiness review of aircraft imported into the EU

TO BE ADDED LATER IF REQUIRED.

SECTION B

PROCEDURES FOR NATIONAL MILITARY AIRWORTHINESS AUTHORITIES

SUBPART A - GENERAL

AMC M.B.102(a) NMAA - General

1. In deciding upon the required airworthiness organisational structure, the NMAA should review the number of certificates to be issued, the number and size of potential Operating Organisations and CAMOs within that pMS, as well as the level of military aviation activity, number and complexity of aircraft and the size of the pMS's aviation industry.
2. The NMAA should retain effective control of important oversight functions and not delegate them in such a way that Operating Organisations, approved maintenance organisations and approved CAMOs, in effect, regulate themselves in airworthiness matters.
3. The set-up of the organisational structure should ensure that the various tasks and obligations of the NMAA are not relying on individuals. That means that a continuing and undisturbed fulfilment of these tasks and obligations of the NMAA should also be guaranteed in case of illness, accident or leave of individual employees.

AMC1 M.B.102(c) NMAA - Qualification and training

1. NMAA inspectors should have:

1.1 practical experience and expertise in the application of aviation safety standards and safe operating practices;

1.2 comprehensive knowledge of:

- (a) relevant parts of national implementing rules/regulations, airworthiness codes and standards and guidance material;
- (b) the NMAA's procedures;
- (c) the rights and obligations of an inspector;
- (d) quality and/or management systems as applicable;
- (e) continuing airworthiness management;
- (f) operational procedures when affecting the continuing airworthiness management of the aircraft or the maintenance.

1.3 training on auditing techniques.

1.4 five years relevant work experience to be allowed to work as an inspector independently. This may include, but should not be limited to, experience gained during training to obtain the subparagraph 1.5 (below) qualification.

1.5 a relevant engineering degree or an aircraft maintenance technician qualification with additional education. 'Relevant engineering degree' means an engineering degree from aeronautical, mechanical, electrical, electronic, avionic or other studies relevant to the maintenance and continuing airworthiness of aircraft/aircraft components.

1.6 knowledge of a relevant sample of the type(s) of military aircraft gained through a formalised training course, including Fuel Tank Safety (FTS) training as described in

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[Appendix XII to AMC M.A.706\(f\) and AMC1 M.B.102\(c\)](#) . These courses should be at least at a level equivalent to EMAR 66 Appendix III Level 1 familiarisation and could be imparted by an EMAR 147 MTO, by the manufacturer, or by any other organisation accepted by the NMAA.

“Relevant sample” means that these courses should cover typical systems embodied in those aircraft being within the scope of approval

1.7 knowledge of maintenance standards.

2. In addition to technical competency, inspectors should have a high degree of integrity, be impartial in carrying out their tasks, be tactful, and have a good understanding of human nature and the military environment.

3. A programme for continuation training should be developed which provides for the inspectors, at regular intervals, to visit appropriate manufacturers and attend technical symposia as well as training or refresher courses to gain first-hand knowledge of new developments. As a general policy, it is not desirable for the inspectors to obtain technical qualifications from those entities under their direct regulatory jurisdiction.

AMC2 M.B.102(c) NMAA - Qualification and training

AIRCRAFT CONTINUING AIRWORTHINESS MONITORING (ACAM) INSPECTORS

1. ACAM in-depth surveys should be performed by NMAA inspectors qualified in accordance with EMAR M.B.102(c).

2. ACAM ramp surveys may be performed by inspectors qualified for the technical tasks of ramp inspections in accordance with EMAR M.B.102(c).

AMC M.B.102(d) NMAA - Procedures

The documented procedures should contain the following information:

(a) The pMS's designation of the NMAA(s).

(b) The title(s) and name(s) of the manager(s) of the NMAA and their duties and responsibilities.

(c) Organisation chart(s) showing associated chains of responsibility of the senior persons.

(d) A procedure defining the qualifications for staff together with a list of staff authorised to sign certificates.

(e) A general description of the facilities.

(f) Procedures specifying how the NMAA ensures compliance with EMAR M.

AMC M.B.104(a) Record-keeping

1. The record-keeping system should ensure that all records are accessible whenever needed within a reasonable time. These records should be organised in a consistent way throughout the NMAA (chronological, alphabetical order, etc.).

2. All records containing sensitive data regarding applicants or organisations should be stored in a secure manner with controlled access to ensure confidentiality of this kind of data.

3. All computer hardware used to ensure data backup should be stored in a different location from that containing the working data in an environment that ensures they remain in good condition. When hardware or software changes take place special care should be taken to ensure that all

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necessary data continues to be accessible at least through the full period specified in EMAR M.B.104 (e).

AMC M.B.104(f) Record-keeping

NOT APPLICABLE.

AMC M.B.105(a) Mutual exchange of information

NOT APPLICABLE.

SUBPART B - ACCOUNTABILITY

To be developed later if required.

SUBPART C - CONTINUING AIRWORTHINESS

AMC M.B.301(a) Aircraft Maintenance Programme (AMP)

For the NMAA to verify compliance with EMAR M.A.302, the auditing inspector should have received training on AMP development and control.

AMC M.B.301(b) Aircraft Maintenance Programme (AMP)

1. When assessing AMPs for approval, the NMAA should verify that the AMP is acceptable for the continuing airworthiness of the specific aircraft listed and it is appropriate for the proposed operating environment and scheduled utilisation.

2. The NMAA should assess the contents taking into account the origins of the document i.e. the manufacturers recommended maintenance programme, a MRB report, the CAMO or Operating Organisation's own experience or another approved programme.

3. NOT APPLICABLE.

4. A copy of the approved AMP should be retained by the NMAA. When the programme is approved by a CAMO, the NMAA should have access to the approved AMP.

5. NOT APPLICABLE.

6. The development of the AMP is dependent upon sufficient satisfactory in-service experience which has been properly processed. In general, the task being considered for escalation beyond the MRB (or equivalent) limits should have been satisfactorily repeated at the existing frequency several times before being proposed for escalation. Appendix I to AMC M.A.302 and AMC M.B.301(b) gives further information.

7. The NMAA may approve an incomplete AMP at the start of operation of a military aircraft or an Operating Organisation, subject to limiting the approval of the AMP to a period that does not exceed any required maintenance not yet approved.

8. If the NMAA is no longer satisfied that a safe operation can be maintained, the approval of an AMP (or part of it) may be suspended or revoked. Events giving rise to such action include:

8.1 An Operating Organisation changing the utilisation of an aircraft (not addressed in the AMP);

8.2 The CAMO has failed to ensure that the AMP reflects the maintenance needs of the aircraft such that safe operation can be assured.

AMC M.B.301(c) Aircraft Maintenance Programme (AMP)

1. Approval of an AMP through a procedure established by a CAMO should require the CAMO to demonstrate to the NMAA that it has competence, procedures and record keeping provisions, which will enable the CAMO to analyse aircraft reliability, (M)TC holder's instructions, and other related operating and maintenance criteria.

2. According to the complexity of the aircraft and the nature of the operation, the AMP procedures should contain reliability centred maintenance and condition monitored maintenance programme procedures and have procedures relating to the programme control which contain the following provisions:

(a) task escalation or adjustment,

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- (b) AMP review,
- (c) SB or Service Information (or national equivalent) assessment,
- (d) component and structures in service performance review,
- (e) AMP revision,
- (f) maintenance procedure effectiveness review and amendment,
- (g) MRB Report (MRBR) or OEM MPD (or equivalent documents) review and assessment, as appropriate,
- (h) AD review and assessment,
- (i) Operating Organisation/Maintenance Organisation/CAMO liaison,
- (j) training.

3. When the NMAA requests it, the CAMO should make provision for the attendance of a NMAA representative at meetings held to consider maintenance implications arising from reviews of the above provisions.

AMC1 M.B.303(a) Aircraft Continuing Airworthiness Monitoring (ACAM)

ACAM SURVEY PROGRAMME - SCOPE

1. The NMAA should establish a programme covering in-depth surveys and ramp surveys.
2. The NMAA's survey programme should select aircraft and/or Operating Organisations depending on the number and complexity of aircraft on the national military register, the diversity of aircraft types, local knowledge of the maintenance environment and operating conditions, airworthiness standards and past surveillance experience.
3. The programme should prioritise the Operating Organisation/fleet/aircraft/key risk elements which are causing the greatest concern.
4. The survey programme should also include a certain percentage of unannounced ramp surveys.
5. The survey programme and changes thereto should be documented.

AMC2 M.B.303(a) Aircraft Continuing Airworthiness Monitoring (ACAM)

ACAM SURVEY PROGRAMME - CREDITING

1. Where the ACAM survey can be linked to the oversight of an approved organisation, then credit can be granted in the monitoring process of that approved organisation.
2. The NMAA may take credit of aircraft airworthiness reviews qualifying for the ACAM programme when these airworthiness reviews are performed in accordance with EMAR M.A.901.

GM M.B.303(a) Aircraft Continuing Airworthiness Monitoring (ACAM)

COMBINED SURVEYS

In the interest of efficient use of NMAA resources, aircraft inspection procedures may be established covering the combined scope of various aircraft survey tasks performed by a NMAA, such as but not limited to:

- ACAM in-depth survey;
- airworthiness review;

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- Military Permit to Fly physical inspection;
- product audit in accordance with EMAR CAMO.B.305(b)(1)ii;
- product audit in accordance with EMAR 145, and;
- review under supervision for ARS authorisation, provided it covers the full scope of the physical survey in accordance with EMAR M.A.901(m).

Depending on which type of survey is required, any actual survey performed may cover a subset of the combined scope.

AMC1 M.B.303(b) Aircraft Continuing Airworthiness Monitoring (ACAM)

SCOPE OF SURVEYS

1. The NMAA should undertake sample product surveys of aircraft on its register to verify that:
 - (a) the condition of an aircraft as sampled is to a standard acceptable for the Military Certificate of Airworthiness (MCOA)/MARC to remain in force,
 - (b) the Operating Organisation/CAMO management of the airworthiness of the registered aircraft is effective,
 - (c) the approvals granted to organisations continue to be applied in a consistent manner to achieve the required standards.

A physical inspection of the aircraft is necessary during each ACAM survey ('ramp' or 'in-depth').

2. Sample product surveys of aircraft may include:
 - (a) 'in-depth' surveys carried out (e.g. during extensive maintenance) that fully encompass selected aspects of an aircraft's airworthiness.
 - (b) 'ramp' surveys carried out during aircraft operations (e.g. on the flight line) to monitor the apparent condition of an aircraft's airworthiness.
 - (i) An ACAM 'ramp' survey is a sample inspection of the selected KREs.
 - (ii) The survey should be an inspection of the aircraft 'as operated'. This may be with 'no-notice' being provided to the Operating Organisation.

3. When performing a ramp survey, the inspector(s) should make all possible efforts to avoid an unreasonable delay of the aircraft inspected.

4. The further information on 'KEY RISK ELEMENTS' can be found in [Appendix III to GM1 M.B.303\(b\)](#).

AMC2 M.B.303(b) Aircraft Continuing Airworthiness Monitoring (ACAM)

IN-DEPTH SURVEY

1. An ACAM in-depth survey is a sample inspection of the key risk elements (KREs) and should be performed during scheduled/extensive maintenance. [Appendix III to GM1 M.B.303\(b\)](#) provides guidance on KREs that can be used for planning and/or analysis of the inspections.
2. The survey should be a 'deep cut' through the elements or systems selected.
3. The record of an ACAM inspection should identify which KREs were inspected.

AMC3 M.B.303(b) Aircraft Continuing Airworthiness Monitoring (ACAM)

KEY RISK ELEMENTS

1. The following KREs should be used for Aircraft Continuing Airworthiness Monitoring:

- (a) Type design and changes to type design;
- (b) Airworthiness limitations;
- (c) Airworthiness Directives;
- (d) Aircraft documents;
- (e) Aircraft Flight Manual;
- (f) Mass & Balance;
- (g) Markings & placards;
- (h) Operational requirements;
- (i) Defect management;
- (j) Aircraft Maintenance Programme;
- (k) Component control;
- (l) Repairs;
- (m) Records;
- (n) Symmetry.

2. These KREs and their detailed components should be adapted to the complexity of the aircraft type being surveyed by retaining only those items that are applicable and relevant for the particular aircraft type.

3. The further information regarding 'KEY RISK ELEMENTS' can be found in [Appendix III to GM1 M.B.303\(b\)](#).

GM1 M.B.303(b) Aircraft Continuing Airworthiness Monitoring (ACAM)

KEY RISK ELEMENTS

The KREs define the scope of continuing airworthiness. The list of KREs is intended to provide the basis for planning and control of the ACAM survey programme. It will ensure that the programme covers all aspects of continuing airworthiness. While it is not required to cover all KREs during a given inspection, the ACAM survey programme should ensure that there is no omission, i.e. avoiding the situation where certain KRE's are never inspected.

The further information on 'KEY RISK ELEMENTS' can be found in Appendix III to GM1 M.B.303(b).

AMC M.B.303(d) Aircraft Continuing Airworthiness Monitoring (ACAM)

FINDINGS ANALYSIS

1. The process should analyse the findings, or combination thereof, in order to identify:

- (a) the root causes and their recurrence;
- (b) the potential impact on flight safety of the individual aircraft or aircraft fleet on the national military register, including hazard identification and risk mitigation; and

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(c) further necessary actions at the level of the organisation(s) or individual(s) interacting with the continuing airworthiness of the aircraft or aircraft fleet.

2. The outcome of the analysis should be used for the further adjustment of the ACAM programme as well as for the purpose of EMAR M.B.303(e), (f) and (g).

3. The purpose of this process is not to analyse individual findings, but to address systemic issues or issues that become apparent at individual, corporate or aggregate level.

SUBPART D - MAINTENANCE STANDARDS

(to be developed as appropriate)

SUBPART E - COMPONENTS

(to be developed as appropriate)

SUBPART F - MAINTENANCE ORGANISATION

NOT APPLICABLE.

SUBPART G - CONTINUING AIRWORTHINESS MANAGEMENT ORGANISATION

NOT APPLICABLE.

SUBPART H - CERTIFICATE OF RELEASE TO SERVICE - CRS

NOT APPLICABLE.

SUBPART I - MILITARY AIRWORTHINESS REVIEW CERTIFICATE (MARC)

AMC M.B.901 Assessment of recommendations

1. The result of the verification and the investigation of a recommendation should be sent to the applicant within 30 days. If corrective action has been requested before the issuance of a MARC, the NMAA may decide a further period for the assessment of the requested corrective action.
2. The verification of the compliance statement required by EMAR M.B.901 does not mean repeating the airworthiness review itself. However, the NMAA should verify that the CAMO has carried out a complete and accurate assessment of the airworthiness of the aircraft.
3. Depending on the content of the recommendation, the history of the particular aircraft, and the NMAA's knowledge of the CAMO making the recommendation in terms of experience, number and correction of findings and previous recommendations the extent of the investigation will vary. Therefore, whenever possible, the person carrying out the investigation should be involved in the oversight of the CAMO making the recommendation.
4. In some cases, the inspector may decide that it is necessary to organise:
 - a physical survey of the aircraft; or
 - a full or partial airworthiness review.

In this case, the inspector should inform the CAMO making the recommendation with sufficient notice so that it may organise itself according to EMAR M.A.901(i).

Furthermore, this part of the investigation should be carried out by appropriate ARS in accordance with EMAR M.B.902(b).

5. Only when satisfied the aircraft is airworthy, should the inspector issue a MARC.

AMC M.B.902(b) Airworthiness review by the NMAA

1. A person qualified in accordance with [AMC1 M.B.102\(c\)](#) subparagraph 1.5 should be considered as holding the equivalent to an aeronautical degree.
2. "Experience in continuing airworthiness" means any appropriate combination of experience in tasks related to aircraft maintenance and/or continuing airworthiness management (engineering) and/or surveillance of such tasks.
3. An appropriate MAML in compliance with EMAR 66 is a category B1/B2 or C licence in the subcategory of the aircraft reviewed. It is not necessary to satisfy the recent experience requirements of EMAR 66 at the time of the review or to hold the military type rating on the particular aircraft.
4. To hold a position with appropriate responsibilities means the ARS should have a position within the NMAA that authorises that person to sign on behalf of the NMAA.
5. A person in the NMAA carrying out airworthiness reviews or airworthiness certificate renewal inspections, prior to the date of entry into force of EMAR M should be considered as complying with EMAR M.B.902(b).

AMC M.B.902(b)(1) Airworthiness review by the NMAA

Formal aeronautical maintenance training means training (internal or external) supported by evidence on the following subjects:

- Relevant parts of initial and continuing airworthiness regulations.

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- Relevant parts of operational requirements and procedures, if applicable.
- Knowledge of the internal procedures for continuing airworthiness.
- Knowledge of a relevant sample of the type(s) of aircraft gained through a formalised training course as described in paragraph 1 of [AMC1 M.B.102\(c\)](#) item 1.6.

AMC M.B.902(b)(2) Airworthiness review by the NMAA

NOT APPLICABLE.

AMC M.B.902(c) Airworthiness review by the NMAA

The minimum content of the ARS record should be:

- Name,
- Rank/Grade and Service Number (if applicable)
- Date of Birth,
- Basic Education,
- Experience,
- Aeronautical Degree or equivalent and/or EMAR 66-qualification and/or nationally-recognised maintenance personnel qualification,
- Initial Training received,
- Type Training received,
- Continuation Training received,
- Experience in continuing airworthiness and within the organisation,
- Responsibilities of current role in the organisation,
- Security clearance (where applicable).

GM to Appendix I to EMAR M - Continuing airworthiness management contract

An Operating Organisation should establish adequate coordination between flight operations and the CAMO to ensure that both will receive all the necessary information on the condition of the aircraft to enable them perform their tasks.

APPENDICES TO AMC AND GM TO EMAR M

Appendix I to AMC M.A.302 and AMC M.B.301(b): Content of the Aircraft Maintenance Programme (AMP)

1 General requirements

1.1 The AMP should contain the following basic information.1.1.1 The type/model and registration number of the aircraft, engines and, where applicable, Auxiliary Power Units and propellers.

1.1.2 The name and address of the Operating Organisation(s) or CAMO managing the aircraft airworthiness.

1.1.3 The reference, the date of issue and issue number of the AMP.

1.1.4 A statement signed by the Operating Organisation or CAMO managing the aircraft airworthiness to the effect that the specified aircraft will be maintained to the AMP and that the AMP will be reviewed and updated as required.

1.1.5 Contents/list of effective pages and their revision status of the document.

1.1.6 Intervals for scheduled maintenance, which reflect the anticipated utilisation of the aircraft. Such utilisation should be stated and include a tolerance, if applicable. Where utilisation cannot be anticipated, calendar time limits should also be included.

1.1.7 Procedures for the escalation of established intervals for scheduled maintenance, where applicable and acceptable to the NMAA.

1.1.8 Provision to record the date and reference of approved amendments incorporated in the AMP.

1.1.9 Details of pre-flight maintenance tasks that are accomplished by maintenance staff.

1.1.10 The tasks and the periods (intervals/frequencies) at which each part of the aircraft, engines, APU's, propellers, components, accessories, equipment, instruments, electrical and radio apparatus, together with the associated systems and installations should be inspected. This should include the type and degree of inspection required.

1.1.11 The periods at which components should be checked, cleaned, lubricated, replenished, adjusted and tested.

1.1.12 If applicable, details of ageing aircraft system requirements together with any specified sampling programmes.

1.1.13 If applicable, details of specific structural maintenance programmes including but not limited to:

- (a) (supplemental) structural inspection programmes ((S)SIPs or (supplemental) structural inspection documents (S)SIDs) issued by the design approval holder.
- (b) Corrosion prevention and control programmes (CPCPs) taking into account the baseline CPCP issued by the design approval holder.
- (c) TO BE ADDED LATER IF REQUIRED.
- (d) Repair Evaluation Guidelines, Repair Assessment Programmes or similar documents (e.g. Battle Damage Repair,...).

1.1.14 If applicable, details of CDCCLs together with appropriate procedures.

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1.1.15 If applicable, a statement of the limit of validity in terms of total flight cycles/calendar date/flight hours/other service life consumption units for the structural programme in 1.1.13.

1.1.16 The periods at which overhauls and/or replacements by new or overhauled components should be made.

1.1.17 A cross-reference to other documents approved by the NMAA which contain the details of maintenance tasks related to mandatory life and inspection limitations, Certification Maintenance Requirements (CMR's) and ADs.

Note: To prevent inadvertent variations to such tasks or intervals these items should not be included in the main portion of the AMP document, or any planning control system, without specific identification of their mandatory status.

1.1.18 Details of, or cross-reference to, any required reliability programme or statistical methods of continuous surveillance.

1.1.19 A statement that practices and procedures to satisfy the programme should be to the standards specified in the maintenance instructions promulgated by the (Military) Type Certificate (M)TC and (Military) Supplemental Type Certificate (M)STC holders and any other organisation that publishes such data in accordance with EMAR 21. In the case of approved practices and procedures that differ, the statement should refer to them.

1.1.20 Each maintenance task quoted should be defined in a definition section of the AMP.

2 AMP basis

2.1 An AMP should normally be based upon the MRB report (or equivalent), where applicable, and the (M)TCH's MPD or the manufacturer's recommended maintenance programme.

The structure and format of these maintenance recommendations may be re-written by the Operating Organisation or the CAMO to better suit the operation and control of the particular AMP.

2.2 For a newly type-certificated aircraft where no previously approved AMP exists, it will be necessary for the Operating Organisation or the CAMO to comprehensively appraise the manufacturer's recommendations (and the MRB report or equivalent where applicable), together with other airworthiness information, in order to produce a realistic AMP for approval.

2.3 For existing aircraft types it is permissible for the Operating Organisation or the CAMO to make comparisons with AMPs previously approved. It should not be assumed that an AMP approved for one Operating Organisation or a CAMO would automatically be approved for another.

Evaluation should be made of the aircraft/fleet utilisation, landing rate, equipment fit and, in particular, the experience of the Operating Organisation/CAMO/other Operating Organisations when assessing an existing AMP.

Where the NMAA is not satisfied that the proposed AMP can be used as is, the NMAA should request appropriate changes such as additional maintenance tasks or de-escalation of established intervals of scheduled maintenance as necessary.

2.4 Critical Design Configuration Control Limitations (CDCCLs)

If CDCCLs have been identified for the aircraft type by the M(S)TC Holder, maintenance instructions should be developed. CDCCLs are characterised by features in an aircraft installation or component that should be retained during modification, change, repair, or scheduled maintenance for the operational life of the aircraft or applicable component or part.

3 Amendments

Amendments (revisions) to the approved AMP should be made by the Operating Organisation or the CAMO to reflect changes in the M(S)TCH's recommendations, modifications, service experience, planned utilisation of the aircraft or as required by the NMAA.

4 Permitted variations to maintenance periods

The Operating Organisation or the CAMO may only vary the periods prescribed by the AMP with the approval of the NMAA or through a procedure developed in the AMP and approved by the NMAA.

5 Periodic review of AMP contents

5.1 The Operating Organisation or the CAMO approved AMPs should be subject to periodic review to ensure that they reflect current M(S)TCH's recommendations, revisions to the MRB report (or equivalent) if applicable, mandatory requirements and the maintenance needs of the aircraft.

5.2 The Operating Organisation or the CAMO should review the detailed requirements at least annually for continued validity in the light of operating experience.

6. Reliability Programmes

6.1 Applicability

6.1.1 A reliability programme should be developed in the following cases (see AMC M.A.302(g)):

- (a) the AMP is based upon MSG-3 logic (or equivalent);
- (b) the AMP includes condition monitored components;
- (c) the AMP does not contain overhaul time periods for all significant system components;
- (d) when specified by the Manufacturer's MPD or MRB.

6.1.2 A reliability Programme need not be developed in the following cases:

- (a) the AMP is based upon the MSG-1 or 2 logic (or equivalent) but only contains hard time or on condition items;
- (b) NOT APPLICABLE.
- (c) the AMP provides overhaul time periods for all significant system components;
- (d) Note: for the purpose of this paragraph, a significant system is a system the failure of which could hazard the aircraft safety.

6.1.3 Notwithstanding paragraphs 6.1.1 and 6.1.2 above, a CAMO may however, develop its own reliability monitoring programme when it may be deemed beneficial from a maintenance planning point of view.

6.2 Applicability for CAMO/Operating Organisation of small fleets of aircraft

6.2.1 For the purpose of this paragraph, a small fleet of aircraft is a fleet of less than 6 aircraft of the same type.

6.2.2 The requirement for a reliability programme is irrespective of the CAMO fleet size.

6.2.3 Complex reliability programmes could be inappropriate for a small fleet. It is recommended that such CAMOs tailor their reliability programmes to suit the size and complexity of operation.

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6.2.4 One difficulty with a small fleet of aircraft consists in the amount of available data which can be processed: when this amount is too low, the calculation of alert levels is very coarse. Therefore “alert levels” should be used carefully.

6.2.5 A CAMO of a small fleet of aircraft, when establishing a reliability programme, should consider the following:

- (a) The programme should focus on areas where a sufficient amount of data is likely to be processed.
- (b) When the amount of available data is very limited, the CAMO engineering judgement is then a vital element. In the following examples, careful engineering analysis should be exercised before taking decisions:
 - A “0” rate in the statistical calculation may possibly simply reveal that not enough statistical data is available, rather than there is no potential problem.
 - When alert levels are used, a single event may have the figures reach the alert level. Engineering judgement is necessary so as to discriminate an artefact from an actual need for a corrective action.

In making its engineering judgement, a CAMO is encouraged to establish contact and make comparisons made with other Operating Organisations/CAMOs of the same aircraft type, where possible and relevant. Making comparison with data provided by the manufacturer may also be possible.

6.2.6 In order to obtain accurate reliability data, it should be recommended to pool data and analysis with one or more other Operating Organisations/CAMOs. Paragraph 6.6 of this Appendix specifies under which conditions it is acceptable that Operating Organisations/CAMOs share reliability data.

6.2.7 Notwithstanding the above there are cases where the CAMO will be unable to pool data with another CAMO, e.g. at the introduction to service of a new aircraft type. In that case, the NMAA should impose additional restrictions on the MRB/MPD, or equivalent, tasks intervals (e.g. no variations or only minor evolution are possible, and with the NMAA approval).

6.3 Engineering judgement

6.3.1 Engineering judgement is itself inherent to reliability programmes as no interpretation of data is possible without judgement. In approving the CAMO maintenance and reliability programmes, the NMAA is expected to ensure that the organisation which runs the programme (it may be the CAMO or an EMAR 145 organisation under contract) hires sufficiently qualified personnel with appropriate engineering experience and understanding of reliability concepts.

6.3.2 It follows that failure to provide appropriately qualified personnel for the reliability programme may lead the NMAA to reject the approval of the reliability programme and therefore the AMP.

6.4 Contracted maintenance

6.4.1 Whereas EMAR M.A.302 specifies that, the AMP, which includes the associated reliability programme, should be managed and presented by the CAMO to the NMAA, the CAMO may subcontract certain functions to the maintenance organisation under contract, provided this organisation proves to have the appropriate expertise.

6.4.2 These functions are:

- (a) Developing the aircraft maintenance and reliability programmes,

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- (b) Performing the collection and analysis of the reliability data,
- (c) Providing reliability reports, and
- (d) Proposing corrective actions to the CAMO.

6.4.3 Notwithstanding the above decision to implement a corrective action (or the decision to request from the NMAA the approval to implement a corrective action) remains the CAMO's prerogative and responsibility. In relation to paragraph 6.4.2(d) above, a decision not to implement a corrective action should be justified and documented.

6.4.4 The arrangement between the CAMO and the maintenance organisation should be specified in the maintenance contract (see Appendix IV to AMC1 CAMO.A.315(c)) and the relevant CAME and maintenance organisation procedures.

6.5 Reliability programme

In preparing the reliability programme details, account should be taken of this paragraph. All associated procedures should be clearly defined.

6.5.1 Objectives

6.5.1.1 A statement should be included summarising as precisely as possible the scope and prime objectives of the reliability programme. As a minimum it should include the following:

- (a) to recognise the need for corrective action,
- (b) to establish what corrective action is needed and,
- (c) to determine the effectiveness of that action.

6.5.1.2 The extent of the objectives should be directly related to the scope of the reliability programme. Its scope could vary from a component defect monitoring system for a small CAMO to an integrated maintenance management programme for a big CAMO. The manufacturer's MPDs may give guidance on the objectives and should be consulted in every case.

6.5.1.3 In case of a MSG-3 (or equivalent) based AMP, the reliability programme should provide a monitor that all MSG-3 (or equivalent) related tasks from the AMP are effective and their periodicity is adequate.

6.5.2 Identification of items.

The items controlled by the reliability programme should be stated, e.g. by S1000D Chapters. Where some items (e.g. aircraft structure, engines, APU) are controlled by separate reliability programmes, the associated procedures (e.g. individual sampling or life development programmes, (M)TCH's structure sampling programmes) should be cross referenced in the reliability programme.

6.5.3 Terms and definitions.

The significant terms and definitions applicable to the reliability programme should be clearly identified. Terms are already defined in MSG-3 (or equivalent) and other relevant documents (e.g. EMAR 145, EMAR M).

6.5.4 Information sources and collection.

6.5.4.1 Sources of information should be listed and procedures for the transmission of information from the sources, together with the procedure for collecting and receiving it, should be set out in detail in the CAME or MOE as appropriate.

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6.5.4.2 The type of information to be collected should be related to the scope and objectives of the reliability programme and should be such that it enables both an overall broad based assessment of the information to be made and also allow for assessments to be made as to whether any reaction, both to trends and to individual events, is necessary. The following are examples of the normal prime sources:

- (a) Pilots' reports.
- (b) Aircraft technical Logs.
- (c) Aircraft maintenance access terminal / On-board maintenance system readouts.
- (d) Maintenance worksheets.
- (e) Workshop reports.
- (f) Reports on functional checks.
- (g) Reports on Special Inspections.
- (h) Stores issues/reports.
- (i) Air Safety Reports.
- (j) Reports on technical delays and incidents.
- (k) Other sources: ETOPS, RVSM, CAT II/III (where applicable).

6.5.4.3 In addition to the normal prime sources of information, due account should be taken of continuing airworthiness and safety information promulgated under EMAR 21.

6.5.5 Display of information.

Collected information may be displayed graphically or in a tabular format or a combination of both. The rules governing any separation or discarding of information prior to incorporation into these formats should be stated. The format should be such that the identification of trends, specific highlights and related events would be readily apparent.

6.5.5.1 The above display of information should include provisions for "nil returns" to aid the examination of the total information.

6.5.5.2 Where "standards" or "alert levels" are included in the reliability programme, the display of information should be orientated accordingly.

6.5.6 Examination, analysis and interpretation of the information.

The method employed for examining, analysing and interpreting the reliability programme information should be explained.

6.5.6.1 Examination.

Methods of examination of information may be varied according to the content and quantity of information of individual reliability programmes. These can range from examination of the initial indication of performance variations to formalised detailed procedures at specific periods, and the methods should be fully described in the reliability programme documentation.

6.5.6.2 Analysis and Interpretation.

The procedures for analysis and interpretation of information should be such as to enable the performance of the items controlled by the reliability programme to

be measured; they should also facilitate recognition, diagnosis and recording of significant problems. The whole process should be such as to enable a critical assessment to be made of the effectiveness of the reliability programme as a total activity. Such a process may involve:

- (a) Comparisons of operational reliability with established or allocated standards (in the initial period these could be obtained from in-service experience of similar equipment or aircraft types).
- (b) Analysis and interpretation of trends.
- (c) The evaluation of repetitive defects.
- (d) Confidence testing of expected and achieved results.
- (e) Statistical analysis of reliability data.
- (f) Reliability predictions.
- (g) Other methods of assessment.

6.5.6.3 The range and depth of engineering analysis and interpretation should be related to the particular reliability programme and to the facilities available. The following, at least, should be taken into account:

- (a) Flight defects and reductions in operational reliability.
- (b) Defects found during line maintenance and those found during base maintenance.
- (c) Deterioration observed during routine maintenance.
- (d) Workshop and overhaul facility findings.
- (e) Modification evaluations.
- (f) Sampling programmes.
- (g) The adequacy of maintenance equipment and publications.
- (h) The effectiveness of maintenance procedures.
- (i) Staff training.
- (j) Service Bulletins (or national equivalent), Technical Instructions, etc.

6.5.6.4 Where the CAMO relies upon contracted maintenance and/or overhaul facilities as an information input to the reliability programme, the arrangements for availability and continuity of such information should be established and details should be included.

6.5.7 Corrective Actions.

6.5.7.1 The procedures and time scales both for implementing corrective actions and for monitoring the effectiveness of corrective actions should be fully described. Corrective actions shall correct any reduction in reliability revealed by the reliability programme and could take the form of one or more of the following:

- (a) Changes to maintenance, operational procedures or techniques.
- (b) Maintenance changes involving inspection frequency and content, function checks, overhaul requirements and time limits, which will require amendment of the scheduled maintenance periods or tasks in the approved AMP. This may

include the escalation or de-escalation of task intervals, addition, modification or deletion of tasks.

(c) Amendments to approved manuals (e.g. AMM, Aircraft Flight Manual, etc.).

(d) Initiation of modifications.

(e) Special inspections or 'fleet campaigns'.

(f) Spares provisioning.

(g) Staff training.

(h) Manpower and equipment planning.

Note: Some of the above corrective actions may need the NMAA's approval before implementation.

6.5.7.2 The procedures for making changes to the AMP should be described. The associated documentation should include a planned completion date for each corrective action, where applicable.

6.5.8 Organisational Responsibilities.

The organisational structure and the department responsible for the administration of the reliability programme should be stated. The chains of responsibility for individuals and departments (Engineering, Production, Quality, Operations etc.) in respect of the reliability programme, together with the information and functions of any reliability programme control committees (reliability group), should be defined. Participation of the NMAA should be stated. This information should be contained in the CAME as appropriate.

6.5.9 Presentation of information to the NMAA.

The following information should be submitted to the NMAA for approval as part of the reliability programme:

(a) The format and content of routine reports.

(b) The time scales for the production of reports together with their distribution.

(c) The format and content of reports supporting requests for increases in periods between maintenance (escalation) and for amendments to the approved AMP. These reports should contain sufficient detailed information to enable the NMAA to make its own evaluation where necessary.

6.5.10 Evaluation and review.

Each reliability programme should describe the procedures and individual responsibilities in respect of continuous monitoring of the effectiveness of the programme as a whole. The time periods and the procedures for both routine and non-routine reviews of maintenance control should be detailed (progressive, monthly, quarterly, or annual reviews, procedures following reliability "standards" or "alert levels" being exceeded, etc.).

6.5.10.1 Each reliability programme should contain procedures for monitoring and, as necessary, revising the reliability "standards" or "alert levels". The organisational responsibilities for monitoring and revising the "standards" should be specified together with associated time scales.

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6.5.10.2 Although not exclusive, the following list gives guidance on the criteria to be taken into account during the review.

- (a) Utilisation (high/low/operational environment).
- (b) Fleet commonality.
- (c) Alert Level adjustment criteria.
- (d) Adequacy of data.
- (e) Reliability procedure audit.
- (f) Staff training.
- (g) Operational and maintenance procedures.

6.5.11 Approval of AMP amendments

The NMAA may authorise the CAMO to implement changes to the AMP arising from the reliability programme results prior to their formal approval by the NMAA, when it is satisfied that;

- (a) the reliability programme monitors the content of the AMP in a comprehensive manner, and
- (b) the procedures associated with the functioning of the “Reliability Group” provide the assurance that appropriate control is exercised by the CAMO over the internal validation of such changes.

6.6 Pooling Arrangements.

6.6.1 In some cases, in order that sufficient data may be analysed it may be desirable to ‘pool’ data: i.e. collate data from a number of CAMOs of the same type of aircraft. For the analysis to be valid, the aircraft concerned, mode of operation and maintenance procedures applied should be substantially the same: variations in utilisation between two CAMOs may, more than anything, fundamentally corrupt the analysis. Although not exhaustive, the following list gives guidance on the primary factors which need to be taken into account.

- (a) Certification factors, such as: aircraft (M)TC data sheet compliance (variant)/modification status, including SB (or national equivalent) compliance.
- (b) Operational Factors, such as: operational environment/utilisation (e.g. low/high/operational environment, etc.)/respective fleet size operating rules applicable (e.g. ETOPS/RVSM/All Weather etc.)/operating procedures/MEL/CDL utilisation.
- (c) Maintenance factors, such as: aircraft ageing maintenance procedures; maintenance standards applicable; lubrication procedures and lubrication programme; MPD revision or escalations applied or AMP applicable.

6.6.2 Although it may not be necessary for all of the above to be completely common, it is necessary for a substantial amount of commonality to exist. Decision should be taken by the NMAA on a case by case basis.

6.6.3 In case of a short term lease agreement (less than 6 month) more flexibility against the para 6.6.1 criteria may be granted by the NMAA, so as to allow the Operating Organisation/CAMO to operate the aircraft under the same programme during the lease agreement effectivity.

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6.6.4 Changes by any one of the CAMO to the above, requires assessment in order that the pooling benefits can be maintained. Where a CAMO wishes to pool data in this way, the approval of the NMAA should be sought prior to any formal agreement being signed between CAMOs.

6.6.5 Paragraph 6.6 is intended to address the pooling of data directly between CAMOs. It is also acceptable that the CAMO participates in a reliability programme managed by the (M)TCH, when the NMAA is satisfied that the (M)TCH manages a reliability programme which complies with the intent of this paragraph.

Appendix II to AMC M.A.711(a)(3): Subcontracting of continuing airworthiness management tasks

NOT APPLICABLE.

Appendix III to GM1 M.B.303(b): Key Risk Elements

	Title	Description
A. AIRCRAFT CONFIGURATION		
A.1	Type design and changes to type design	The type design is the part of the approved configuration of a product, as laid down in the (M)TCDS, common to all products of that type. Any changes to type design shall be approved and, for those embodied, shall be recorded with the reference to the approval.
A.2	Airworthiness limitations	An airworthiness limitation is a boundary beyond which an aircraft or a component thereof must not be operated, unless the instruction(s) associated to this airworthiness limitation is (are) complied with.
A.3	Airworthiness Directives	An Airworthiness Directive means a document issued or adopted by the NMAA, which mandates actions to be performed on an aircraft to restore an acceptable level of safety, when evidence shows that the safety level of this aircraft may otherwise be compromised (EMAR 21.A.3B).
B. AIRCRAFT OPERATION		
B.1	Aircraft documents	Aircraft certificates and documents necessary for operations.
B.2	Aircraft Flight Manual	A manual, associated with the (Military) Type Certificate, containing limitations within which operation of the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.
B.3	Mass & balance	Mass and balance data is required to make sure the aircraft is capable of operating within the approved envelope.
B.4	Markings & placards	Markings and placards are defined in the individual aircraft type design. Some information may also be found in the (Military) Type Certificate Data Sheet, the (Military) Supplemental Type Certificates, the Aircraft Flight Manual, the Aircraft Maintenance Manual, the Illustrated Parts Catalogue, etc.
B.5	Operational requirements	Items required to be installed to perform a specific type of operation.
B.6	Defect management	Defect management requires a system whereby information on faults, malfunctions, defects and other occurrences that cause or might cause adverse effects on the continuing airworthiness of the aircraft are captured. This system should be properly documented. It may include, amongst others, the Minimum Equipment List system (or national equivalent), the Configuration Deviation List system and deferred defects management.
B.7	Symmetry check	Symmetry check data is required to make sure the aircraft is within the approved design data issued by the relevant design approval holder.

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C. AIRCRAFT MAINTENANCE		
C.1	Aircraft Maintenance Programme	A document which describes or incorporates by reference the specific scheduled maintenance tasks and their frequency of completion, the associated maintenance procedures and related standard maintenance practices necessary for the safe operation of those aircraft to which it applies.
C.2	Component control	Component control should consider two objectives for component maintenance: - maintenance for which compliance is mandatory; - maintenance for which compliance is recommended.
C.3	Repairs	All repairs and unrepaired damage/degradations need to comply with the instructions of the appropriate maintenance manual (e.g. the SRM, the AMM, the CMM). All repairs not defined in the appropriate maintenance manual need to be appropriately approved and recorded with the reference to the approval. This includes any damage or repairs to the aircraft/engine(s)/propeller(s), and their components.
C.4	Records	Continuing Airworthiness records are defined in EMAR M.A.305 and EMAR M.A.306 and their related AMCs.

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A.1	Type design and changes to type design	The Type Design is the part of the approved configuration of a product, as laid down in the (M)TCDS, common to all products of that type. Any changes to type design shall be approved and, for those embodied, shall be recorded with the reference to the approval.
Supporting information		Typical inspection items
The type design consists of: 1. the drawings and specifications, and a listing of those drawings and specifications, necessary to define the configuration and the design features of the product (i.e. the aircraft, its components, etc.) shown to comply with the applicable type-certification basis and environmental protection requirements (where applicable); 2. information on materials and processes and on methods of manufacture and assembly of the product necessary to ensure the conformity of the product; 3. an approved Airworthiness Limitation Section (ALS) of the Instructions for Continuing Airworthiness (ICA); and 4. any other data necessary to allow by comparison the determination of the airworthiness, the characteristics of noise, fuel venting and exhaust emissions (where applicable) of later products of the same type. The individual aircraft design is made of the type design supplemented with changes to the type design (e.g. modifications) embodied on the considered aircraft. Depending on the product State of Design, Recognition Agreements and/or Authority decisions on acceptance of certification findings may exist and should be taken into account.		1. Use the current (Military) Type Certificate Data Sheets (airframe, engine, propeller as applicable) and check that the aircraft conforms to its type design (correct engine(s) installed, mission equipment, etc.). 2. Check that changes have been approved properly (approved data is used, and a direct relation to the approved data). 3. Check for unintentional deviations from the approved type design (sometimes referred to as concessions), divergences, or non-conformances, Technical Adaptations, Technical Variations, etc. 4. Check cabin configuration (LOPA) (if applicable). 5. Check for embodiment of (M)STC's and, if any Airworthiness Limitations Section (ALS)/ Aircraft Flight Manual/Minimum Equipment List/Mass & Balance Manual and revisions are needed, they have been approved and complied with. 6. Check that the individual aircraft design/configuration is properly established and used as a reference. 7. The following are typical points that should be checked: a. Aircraft S/N applicable b. Applicable engines and propellers c. Applicable APU d. Max. certified mass e. Seating/cargo configuration (if applicable) f. Exits (including emergency egress) g. Mission equipment
Reference documents:		- EMAR 21.A.31 - EMAR 21.A.41 - EMAR 21.A.61 - EMAR 21.A.90A - EMAR M.A.304 - EMAR M.A.305 - EMAR M.A.401

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

A.2	Airworthiness limitations	An airworthiness limitation is a boundary beyond which an aircraft or a component thereof must not be operated, unless the instruction(s) associated with this airworthiness limitation is complied with.
Supporting information		Typical inspection items
Airworthiness limitations are exclusively associated with instructions whose compliance is mandatory as part of the type design. They apply to some scheduled or unscheduled instructions that have been developed to prevent and/or to detect the most severe failure. They mainly apply to maintenance (mandatory modification, replacement, inspections, checks, etc.), but can also apply to instructions to control critical design configurations (for example Critical Design Configuration Control Limitations (CDCCL) for the fuel tank safety).		1. Check that the Aircraft Maintenance Programme (AMP) reflects airworthiness limitations and associated instructions issued by the relevant design approval holders and is approved by the NMAA, if applicable. 2. Check that the aircraft and the components thereof comply with the approved AMP. 3. Check the current status of life-limited parts. The current status of life-limited parts is to be maintained throughout the operating life of the part. 4. Typical Airworthiness Limitation Items: - Safe Life Airworthiness Limitation Item (SL ALI)/Life limited parts, - Damage Tolerant Airworthiness Limitation Item (DT ALI)/Structure, including ageing aircraft structure, - Certification Maintenance Requirements (CMR), - Ageing Systems Maintenance (ASM), including Airworthiness Limitations for Electrical Wiring Interconnection System (EWIS), - Fuel Tank Ignition Prevention (FTIP)/Flammability Reduction Means (FRM), - CDCCL, check wiring if any maintenance carried out in same area - wiring separation, - Ageing fleet inspections mandated through ALS or AD are included in the AMP.
Reference documents:		- EMAR 21.A.31 - EMAR 21.A.61 - Relevant ICA certification requirement for the aircraft type being inspected (refer to Type Certification basis) - EMAR M.A.302 - EMAR M.A.305 - EMAR M.A.901(k)(7)

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

A.3	Airworthiness Directives	An Airworthiness Directive means a document issued or adopted by the NMAA, which mandates actions to be performed on an aircraft to restore an acceptable level of safety, when evidence shows that the safety level of this aircraft may otherwise be compromised (EMAR 21A.3B).
Supporting information		Typical inspection items
Any Airworthiness Directive issued by the NMAA for an aircraft or for an engine, propeller, part or appliance installed on an aircraft shall apply.		1. Check if all ADs applicable to the airframe, engine(s), propeller(s) and equipment have been incorporated in the AD-status, including their revisions. 2. Check records for correct AD applicability (including ADs incorrectly listed as non-applicable). 3. Check by sampling in the current AD status that applicable ADs have been or are planned to be (as appropriate) carried out within the requirements of these Airworthiness Directives, unless otherwise specified by the NMAA (AMOC). 4. Check that applicable ADs related to maintenance are included into the Aircraft Maintenance Programme. 5. Check that task-cards correctly reflect AD requirements or refer to procedures and standard practices referenced in ADs. 6. Sample during a physical survey some ADs for which compliance can be physically checked.
Reference documents:		- EMAR 21.A.3B - EMAR 21.B.60 - EMAR 21.B.326 - EMAR 21.B.327 - EMAR M.A.303 - EMAR M.A.305 (d) & (h) - EMAR M.A.401 - EMAR M.A.501(b) - EMAR M.A.503(a) - EMAR M.A.504

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

B.1	Aircraft documents	Aircraft certificates and documents necessary for operations.
Supporting information		Typical inspection items
The aircraft certificates and documents necessary for operations may include, but are not necessarily limited to: - Certificate of Registration (if applicable); - Military Certificate of Airworthiness; - Noise certificate (if applicable); - Aircraft Certificate of Release to Service; - Technical logbook, if required; - Military Airworthiness Review Certificate; - Etc.		1. Check that all certificates and documents pertinent to the aircraft and necessary for operations (or copies, as appropriate) are available. 2. Check MCoA modification/Aircraft identification. 3. Check that noise certificate corresponds to aircraft configuration (if applicable). 4. Check Military Permit to Fly and Flight Conditions when necessary. 5. Check that there is an appropriate aircraft Certificate of Release to Service.
Reference documents:		- EMAR 21 Subpart H - EMAR 21.A.175 - EMAR 21.A.177 - EMAR 21.A.182 - EMAR 21 Subpart I - EMAR 21 Subpart P - EMAR 21 Subpart Q - EMAR 21.A.801 - EMAR 21.A.807 - EMAR M.A.201(a)(3)

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

B.2	Aircraft Flight Manual	A manual, associated with the (Military) Type Certificate, containing operational limitations, instructions and information necessary to the flight crew members for the safe operation of the aircraft.
Supporting information		Typical inspection items
The AFM needs to reflect the current status/configuration of the aircraft. When it does not, it may provide flight crew members with wrong information. This may lead to errors and/or to override limitations that could contribute to severe failure.		1. Check the conformity of the AFM, latest issue with aircraft configuration, including modification status, (AD, SB, (M)STC etc.). 2. Check: - the AFM approval, revision control, Supplement to AFM; - the impact of modification status on noise (if applicable) and mass & balance; - additional required manuals; - AFM limitations.
Reference documents:		- EMAR 21.A.174(b)2(iii) & (b)3(ii) - EMAR 21.A.204(b)1(ii) & (b)2(i) - EMAR M.A.305 & AMC M.A.305(d) - AMC M.A.901(d) & (g) - EMAR M.A.902(b)3

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

B.3	Mass & balance	Mass and balance data is required to make sure the aircraft is capable of operating within the approved envelope.
Supporting information		Typical inspection items
The mass and balance report needs to reflect the actual configuration of the aircraft. When it does not, the aircraft might be operated outside the certified operating envelope.		1. Check that the mass and balance report is valid, considering current configuration. 2. Make sure that modifications and repairs are taken into account in the report. 3. Check that equipment status is recorded on the mass and balance report. 4. Compare current mass and balance report with previous report for consistency.
Reference documents:		- EMAR M.A.305(c) - EMAR M.A.901(k)(9)

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

B.4	Markings & placards	Markings and placards are defined in the individual aircraft type design. Some information may also be found in the (Military) Type Certificate Data Sheet, the (Military) Supplemental Type Certificates, the Aircraft Flight Manual, the Aircraft Maintenance Manual, the Illustrated Parts Catalogue, etc.
Supporting information		Typical inspection items
Markings and placards on instruments, equipment, controls, etc. shall include such limitations or information as necessary for the direct attention of the crew during flight. Markings and placards or instructions shall be provided to give any information that is essential to the ground handling in order to preclude the possibility of mistakes in ground servicing (e.g. towing, refuelling) that could pass unnoticed and that could jeopardise the safety of the aircraft in subsequent flights. Markings and placards or instructions shall be provided to give any information essential in the prevention of passenger injuries. National military registration markings/insignia must be installed. They include registration, possible flag, fireproof registration plate. Product data plates must be installed. When markings and placards are missing, or unreadable, or not properly installed, mistakes or aircraft damage may occur and could subsequently contribute to a severe failure.		1. Check that the required markings and placards are installed on the aircraft, especially the emergency exit/egress markings instructions and passenger information signs and placards (where applicable). 2. Check that all installed placards are readable. 3. Check the Aircraft Flight Manual versus the instruments. 4. Check registration markings/national insignia. 5. Check product data plates. Examples of markings & placards: - markings related to military equipment/operations (e.g. weapons, ejection seats, AAR, etc). - door means of opening, - each compartment's mass/load limitation/placards stating limitation on contents, - passenger information signs, including no smoking signs (where applicable), - emergency exit/egress marking, - pressurised cabin warning (if applicable), - calibration placards, - cockpit placards and instrument markings, - Oxygen system information data, - accesses to the fuel tanks with flammability reduction means (CDCCL), - fuelling markings (fuel vent, fuel dip stick markings), - EWIS identification, - towing limit markings, - break-in markings, - inflate tyres with nitrogen, - RVSM + pitot static markings
Reference documents:		- EMAR 21.A.175 - EMAR 21.A.715 - EMAR 21.A.801 - EMAR 21.A.803 - EMAR 21.A.804 - EMAR 21.A.805 - EMAR 21.A.807 - Relevant certification requirement for the aircraft type being inspected (refer to Type Certification basis)

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

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| | <ul style="list-style-type: none">- EMAR M.A.501- EMAR M.A.901(m) |
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EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

B.5	Operational requirements	Items required to be installed to perform a specific type of operation.
Supporting information		Typical inspection items
This includes all equipment required by the applicable operational military requirements. In case of malfunction, faulty equipment can create a hazardous situation. Especially emergency equipment needs attention during this inspection.		1. Check permits required for type of operation. 2. Check for the presence and serviceability of equipment required by operational military requirements. 3. Check safety equipment, check that emergency equipment is readily accessible (if applicable).
Reference documents:		- EMAR M.A.201(a)(2) - EMAR 21 Subpart I - National operational military requirements

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

B.6	Defect management	Defect management requires a system whereby information on faults, malfunctions, defects and other occurrences that cause or might cause adverse effects on the continuing airworthiness of the aircraft are captured. This system should be properly documented. It may include, amongst others, the Minimum Equipment List system (or national equivalent), the Configuration Deviation List system and deferred defects management.
Supporting information		Typical inspection items
This KRE addresses the effectiveness of defect management, it should also consider defects found during the physical inspection.		1. Check that the deferred defects have been identified, recorded, and rectified/deferred in accordance with approved procedures and within approved time limits. 2. Check that operations outside published approved data have only been performed under a Military Permit to Fly or under national flexibility provisions (if applicable). Sample on: a. Deferred defect list (e.g. hold item list), b. maintenance task cards, c. engine shop report, d. (major) component shop report, e. maintenance/repair/modification working party files after embodiment of modifications or repairs, f. occurrence reporting data, g. communications between the user of maintenance data and the maintenance data author in case of inaccurate, incomplete, ambiguous procedures and practices. 3. Check that the consequences of the deferral have been managed with the Operating Organisation/CAMO. 4. Check that defects are being deferred in accordance with approved data (current revision of the MEL, CDL, aircraft maintenance data). 5. Compare physical location of parts/serial numbers with recorded locations to identify undocumented part-swaps for troubleshooting.
Reference documents:		- EMAR M.A.301(b) - AMC M.A.301(b) - EMAR M.A.403 - AMC M.A.901(k) - EMAR 145.A.60 - EMAD 20-8

EMAR M AMC & GM - CONTINUING AIRWORTHINESS REQUIREMENTS

B.7	Symmetry check	Symmetry check data is required to make sure the aircraft is within the approved design data issued by the relevant design approval holder.
Supporting information		Typical inspection items
A symmetry check is done by taking selected measurements for comparison with the measurements taken at the same points on the aircraft when the aircraft was prepared for delivery by the Original Equipment Manufacturer (OEM). All reference points and dimensions are defined in last revision of the Aircraft Maintenance Manual (AMM).		1. Check that the required reference points are present and readable on the aircraft. 2. Check that the symmetry check report is valid, considering current configuration. 3. Make sure that a symmetry check is performed after the following conditions have occurred: a. hard or overweight landing, b. abnormal loads to the structure due to 'g' limits being exceeded or due to other causes e.g. severe turbulence, c. a major structural component is changed, d. when the flying characteristics of the aircraft are such as to cause doubt in the correctness of the symmetry check. 4. Check that the position relationship of each major component is inspected. 5. Compare current symmetry check report with previous report for consistency.
Reference documents:		- EMAR M.A.305(c)5 - EMAR M.A.901(k)12 - AMC M.A.901(d)

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C.1	Aircraft Maintenance Programme	A document which describes the specific scheduled maintenance tasks and their frequency of completion, related standard maintenance practices and the associated procedures necessary for the safe operation of those aircraft to which it applies.
Supporting information		Typical inspection items
The Aircraft Maintenance Programme (AMP) is intended to include scheduled maintenance tasks, the associated procedures and standard maintenance practices. It also includes the reliability programme, when required. Tasks included in the AMP can originate from: - tasks for which compliance is mandatory: instructions specified in repetitive Airworthiness Directives (AD), or in the Airworthiness Limitations Section (ALS), which may include Certification Maintenance Requirements (CMRs). The ALS is included in the Instructions for Continuing Airworthiness (ICA) of a design approval holder; - tasks for which compliance is recommended: additional instructions specified in the Maintenance Review Board Report (MRBR) or equivalent, the Maintenance Planning Document (MPD), Service Bulletins (SB), or any other non-mandatory continuing airworthiness information issued by the design approval holder or the NMAA; - additional or alternative instructions proposed by the CAMO once approved in accordance with EMAR M.A.302(e); The AMP shall contain details, including frequency, of all maintenance to be carried out, including any specific tasks linked to the type and the specificity of operations.		Review of AMP contents: 1. Check that the AMP properly reflects mandatory continuing airworthiness instructions (ALIs, CMRs (the latest source documents' revision)). Sample check that tasks are implemented within approved compliance times and that no tasks have been omitted. 2. Check how recommended scheduled maintenance tasks (such as TBO intervals, recommended through Service Bulletins, Service Letters, etc., the latest source documents' revision) are considered when updating the AMP. 3. Check that the AMP properly reflects the maintenance tasks specified in repetitive ADs. 4. Check that the AMP properly reflects additional Instructions for Continuing Airworthiness resulting from specific installed equipment or modifications embodied. 5. Check that the AMP properly reflects additional Instructions for Continuing Airworthiness resulting from repairs embodied. 6. If applicable, check that the AMP properly reflects additional maintenance tasks required by specific approvals. 7. Check for any additional scheduled maintenance measures required due to the use of the aircraft and the operational environment. 8. Not Applicable 9. Check the approval status of additional or alternative instructions (EMAR M.A.302(e)). 10. Check if a reliability programme is present and active when required. 11. Check if the AMP is approved by the NMAA directly, or by the CAMO via indirect approval procedure. Review of aircraft compliance with an AMP: 12. Check if the AMP used is valid for the aircraft, and is reviewed annually. 13. Check if tasks are performed within the value(s) quoted in the AMP and the source documents 14. Sample check that no task has been omitted without justifications accepted by the NMAA (at the time of decision).

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	15. Check the reporting of performed scheduled maintenance into the aircraft continuing airworthiness record system. 16. Analyse the effectiveness of the AMP and the reliability programme by reviewing the unscheduled tasks.
Reference documents:	- EMAR M.A.302 & AMC M.A.302. - EMAR CAMO A.315(b)1 & (b)5

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C.2	Component control	Component control should consider a two objectives for component maintenance: - maintenance for which compliance is mandatory. - maintenance for which compliance is recommended.
Supporting information		Typical inspection items
Depending on each maintenance task, accomplishment is <u>scheduled</u> or <u>unscheduled</u>. Refer to KRE C.1 'Aircraft Maintenance Programme'. Components with a mandatory life limitation must be permanently removed from service when, or before, their operating limitation is exceeded. The life limitation is controlled at the component level (in opposition to aircraft level). Components which are 'time-controlled components' include the following: – components for which removal and restoration are scheduled, regardless of their level of failure resistance. Reference is made to hard time components: They are subject to periodic maintenance dealing with a deterioration that is assumed to be predictable (the overall reliability invariably decreases with age): Failure is less likely to occur before restoration is necessary; – components for which failure resistance can reduce and drop below a defined level: Inspections are scheduled to detect potential failures. Reference is made to 'On-condition' components: They are called such because components, which are inspected, are left in service (no further maintenance action taken) on the condition that they continue to meet specified performance standards. Notes: 1. Restoration tasks for hard time components are not the same as 'On-condition' tasks, since they do not monitor gradual deterioration, but are primarily done to ensure the item may continue to remain in service until the next planned restoration. 2. Components subject to 'condition-monitoring' are permitted to remain in service without preventive maintenance until functional failure occurs. Reference is made to 'fly-to-failure'. Such components are subject to unscheduled tasks.		1. Check that the mandatory maintenance tasks are identified as such and managed separately from recommendations. 2. Sample check installed components (P/N and S/N) against aircraft records: a. Correct Part Number and Serial Number installed. b. Correct authorised release document available. 3. Check the current status of time-controlled components, with due consideration to deferred items. They must identify: a. The affected components (Part Number and Serial Number). b. For components subject to a repetitive task: the task description and reference, the applicable threshold/interval, the last accomplishment data (date, the component's total accumulated life in hours, cycles, landings, calendar time, or any other approved service life consumption units as necessary) and the next planned accomplishment data. c. For components subject to an unscheduled task: the task description and reference, the accomplishment data (date, the component's total accumulated life in hours, cycles, landings, calendar time, or any other approved service life consumption units as necessary). Pay attention to ETOPS and CDCCL components. 4. Check current status of life-limited parts. This status can be requested upon each transfer throughout the operating life of the part: a. The life limitation, the component's total accumulated life, and the life remaining before the component's life limitation is reached (indicating hours, cycles, landings, calendar time, or any other approved service life consumption units as necessary). b. If relevant for the determination of the remaining life, a full installation history indicating the number of hours, cycles or calendar time or any other approved service life consumption units relevant to each installation on these different types of aircraft/engine. 5. Check if the AMP and reliability programme results impact the component control.

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	6. Check that life-limited and time controlled components are correctly marked during a physical survey.
Reference documents:	- EMAR 21.A.805 - EMAR M.A.302 - EMAR M.A.305 - EMAR M.A.501 - EMAR M.A.503 - EMAR M.901

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C.3	Repairs	All repairs and unrepaired damage/degradations need to comply with the instructions of the appropriate maintenance manual (e.g. the SRM, the AMM, the CMM). Repairs not defined in the appropriate maintenance manual need to be appropriately approved and recorded with the reference to the approval. This includes any damage or repairs to the aircraft/engine(s)/propeller(s), and their components.
Supporting information		Typical inspection items
The data substantiating repairs should include, but is not limited to, the damage assessment, the rationale for the classification of the repair, the evidence the repair has been designed in accordance with approved data, i.e. by reference to the appropriate manual, procedure or to an EMAR 21 repair design approval, the drawings/material and accomplishment instructions, as well as the maintenance and operational instructions. 'Repair status' means a list of: - the repairs embodied since the original delivery of (and still existent upon) the aircraft/engine/propeller/component; and - the unrepaired damage/degradations. It also includes, either directly or by reference to supporting documentation (i.e. repair files), the substantiating data supporting compliance with the applicable airworthiness requirements. The repair status should identify the repair file reference, the repair classification, the repaired item (i.e. aircraft/engine/propeller/component, and a precise location if necessary), and the date and total life in flying hours/flight cycles/any other service life consumption units accumulated by the item at the time of repair or finding of the un-repaired damage/degradations. Cross-reference to the AMP should also be included, as necessary. Depending on the product State of Design, Recognition Agreements and/or Authority Decisions on acceptance of certification findings may exist and should be taken into account for the determination of acceptable data for repairs.		1. Sample the repair status to confirm it appropriately traces repairs and un-repaired damage/deteriorations. 2. Sample repair files (at least one file for each type of repaired item) to check that repaired and unrepaired damage/deterioration have been assessed against the latest published approved repair data. 3. Check that repair instructions detailed in the repair file comply with published approved repair data. 4. Check that major repairs resulting in new or amended airworthiness limitations and associated mandatory instructions (including ageing aircraft programme) have been included in the AMP. 5. Check that new or amended maintenance instructions resulting from repairs have been considered for inclusion in the AMP. 6. Compare the repair status and the physical status of the repaired aircraft/engine(s)/propeller(s), and their repaired components (physical survey) in order to confirm the accuracy of the repair status. Sample embodied repairs to check their conformity against the repair files (physical survey).
Reference documents:		- EMAR 21.A.431A - EMAR 21.A.431B - EMAR M.A.304 & AMC M.A.304 - EMAR M.A.305 & AMC M.A.305(c)(2) - EMAR M.A.401 & AMC M.A.401

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C.4	Records	Continuing Airworthiness records are defined in EMAR M.A.305 and EMAR M.A.306 and their related AMCs.
Supporting information		Typical inspection items
Retention/Transfer of the records is required so that the status of the aircraft and its components can be readily established at any time. Task accomplishment is scheduled (one time or periodically), or unscheduled (e.g. following an event). Aircraft continuing airworthiness records (refer to logbooks, technical logbooks, component log cards or task cards or worksheets) shall provide the status with regard to: - scheduled tasks: • one-time: life-limited parts status, modification status, repair status. • repetitive: maintenance programme status. - unscheduled tasks.		1. Check the aircraft continuing airworthiness record system: EMAR M.A.305 and EMAR M.A.306 (as applicable) require that certain records are kept for defined periods. Pay attention to the continuity, integrity and traceability of records: a. integrity: Check the data recorded is legible, b. continuity: Check that records are available for the applicable retention period, c. traceability: Check the link between Operating Organisation/CAMO and maintenance documentation, traceability to approved data, traceability to appropriate release documents, etc. 2. If applicable, make sure that the Aircraft Technical Log is used correctly, including: a. current aircraft Certificate of Release to Service (including the current maintenance statement) issued, and b. pre-flight inspections signed-off by authorised persons; 3. Check that any maintenance required following abnormal operation/event (such as overspeed, overweight operation, hard landing, excessive turbulence, and operation outside of Aircraft Flight Manual limitations) has been performed, as applicable.
Reference documents:		- EMAR M.A.305 & AMC M.A.305 - EMAR M.A.306 & AMC M.A.306 - EMAR M.A.307 & AMC M.A.307

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Abbreviations used in Appendix III:

AAR	Air to Air Refueling
ACAM	Aircraft Continuing Airworthiness Monitoring
AD	Airworthiness Directive
AFM	Aircraft Flight Manual
ALI	Airworthiness Limitation Items
ALS	Airworthiness Limitations Section
AMC	Acceptable Means of Compliance
AMM	Aircraft Maintenance Manual
AMP	Aircraft Maintenance Programme
APU	Auxiliary Power Unit
ASM	Ageing Systems Maintenance
CAMO	Continuing Airworthiness Management Organisation
CDCCL	Critical Design Configuration Control Limitations
CDL	Configuration Deviation List
CMM	Component Maintenance Manual
CMR	Certification Maintenance Requirement
DT	Damage Tolerant
ETOPS	Extended Range Operations with Two-engined aeroplanes
EWIS	Electrical Wiring Interconnection System
FRM	Flammability Reduction Means
FTIP	Fuel Tank Ignition Prevention
IPC	Illustrated Parts Catalogue
ICA	Instructions for Continuing Airworthiness
KRE	Key Risk Element
LOPA	Layout of Passenger Accommodation
MCoA	Military Certificate of Airworthiness
MEL	Minimum Equipment List
MRB	Maintenance Review Board
MRBR	Maintenance Review Board Report
MPD	Maintenance Planning Document
(M)STC	(Military) Supplemental Type Certificate
NMAA	National Military Airworthiness Authority
OEM	Original Equipment Manufacturer
P/N	Part Number
RVSM	Reduced Vertical Separation Minima
S/N	Serial Number
SB	Service Bulletin
SL	Safe Life
SRM	Structural Repair Manual
TBO	Time Between Overhauls
(M)TC	(Military) Type Certificate
(M)TCDS	(Military) Type Certificate Data Sheet

Appendix IV to AMC M.A.604: Maintenance organisation manual

NOT APPLICABLE.

Appendix V to AMC1 M.A.704: Continuing Airworthiness Management Exposition (CAME)

NOT APPLICABLE.

Appendix VI to AMC M.B.602(f): EASA Form 6F

NOT APPLICABLE.

Appendix VII to AMC M.B.702(f): EMAR Form 13

NOT APPLICABLE.

Appendix VIII to AMC M.A.616: Organisational Review

NOT APPLICABLE.

Appendix IX to AMC M.A.602 and AMC M.A.702: EMAR Form 2

NOT APPLICABLE.

Appendix X to AMC M.B.602(a) and AMC M.B.702(a): EMAR Form 4

NOT APPLICABLE.

Appendix XI to AMC M.A.708(c): Contracted Maintenance

NOT APPLICABLE.

Appendix XII to AMC M.A.706(f) and AMC1 M.B.102(c): Fuel Tank Safety Training

This appendix includes general instructions for providing training on Fuel Tank Safety issues.

A) Effectivity:

Aeroplanes as nationally defined by the NMAA.

B) Affected organisations:

- CAMOs involved in the continuing airworthiness management of aeroplanes specified in paragraph A).
- NMAA responsible for the oversight as per EMAR CAMO.B.305 of aeroplanes specified in paragraph A) and for the oversight of the CAMOs specified in this paragraph B).

C) Persons from affected organisations who should receive training:Phase 1 only:

- The group of persons representing the CAMO management structure, the compliance monitoring manager, the safety manager and the staff who are directly involved in monitoring the compliance of the organisation.
- Personnel of the NMAA responsible for the oversight of aeroplanes specified in paragraph A) and in the oversight of CAMOs specified in paragraph B).

Phase 1 + Phase 2 + Continuation training:

- Personnel of the CAMO involved in the management and review of the continuing airworthiness of aircraft specified in paragraph A);

D) General requirements of the training coursesPhase 1 – Awareness

The training should be carried out before the person starts to work without supervision but not later than 6 months after joining the organisation. The persons who have already attended a Level 1 Familiarisation course recognized by the NMAA are already in compliance with Phase 1.

Type: Should be an awareness course with the principal elements of the subject. It may take the form of a training bulletin, or other self-study or informative session. Signature of the reader is required to ensure that the person has passed the training.

Level: It should be a course at the level of familiarisation with the principal elements of the subject.

Objectives:

The trainee should, after the completion of the training:

1. Be familiar with the basic elements of the fuel tank safety issues.
2. Be able to give a simple description of the historical background and the elements requiring a safety consideration, using common words and showing examples of non-conformities.
3. Be able to use typical terms.

Content: The course should include:

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- a short background showing examples of FTS accidents or incidents,
- the description of concept of fuel tank safety and CDCCL,
- some examples of manufacturers documents showing CDCCL items,
- typical examples of FTS defects,
- some examples of (M)TC holders repair data
- some examples of maintenance instructions for inspection.

Phase 2 - Detailed training

A flexible period may be allowed by the NMMA's to allow organisations to set the necessary courses and impart the training to the personnel, taking into account the organisation's training schemes/means/practices.

The persons who have already attended the Level 2 Detailed training course recognised by the NMAA are already in compliance with Phase 2 with the exception of continuation training.

Staff should have received Phase 2 training within 12 months of joining the organisation.

Type: Should be a more in-depth internal or external course. It should not take the form of a training bulletin or other self-study. An examination should be required at the end, which should be in the form of a multi choice question, and the pass mark of the examination should be 75%.

Level: It should be a detailed course on the theoretical and practical elements of the subject.

The training may be made either:

- in appropriate facilities containing examples of components, systems and parts affected by Fuel Tank Safety (FTS) issues. The use of films, pictures and practical examples on FTS is recommended; or
- by attending a distance course (e-learning or computer based training) including a film when such film meets the intent of the objectives and content here below. An e-learning or computer based training should meet the following criteria:
 - A continuous evaluation process should ensure the effectiveness of the training and its relevance;
 - Some questions at intermediate steps of the training should be proposed to ensure that the trainee is authorized to move to the next step;
 - The content and results of examinations should be recorded;
 - Access to an instructor in person or at distance should be possible in case support is needed.

A duration of 8 hours for phase 2 is an acceptable compliance.

When the course is provided in a classroom, the instructor should be very familiar with the data in Objectives and Guidelines. To be familiar, an instructor should have attended himself a similar course in a classroom and made additionally some lecture of related subjects.

Objectives:

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The attendant should, after the completion of the training:

- have knowledge of the history of events related to fuel tank safety issues and the theoretical and practical elements of the subject, have an overview of the specific regulations (e.g. FAA regulations known as SFAR (Special FAR) 88 of the FAA and of JAA Temporary Guidance Leaflet TGL 47), be able to give a detailed description of the concept of fuel tank system ALI (including Critical Design Configuration Control Limitations CDCCL, and using theoretical fundamentals and specific examples;
- have the capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner;
- have knowledge on how the above items affect the aircraft;
- be able to identify the components or parts of the aircraft subject to FTS from the manufacturer's documentation,
- be able to plan the action or apply a Service Bulletin and an Airworthiness Directive.

Content: Following the guidelines described in paragraph E).

Continuation training:

The organisation should ensure that the continuation training is performed in each two years period. The syllabus of the training programme referred to in the Training policy of the Continuing Airworthiness Management Exposition (CAME) should contain the additional syllabus for this continuation training.

The continuation training may be combined with the phase 2 training in a classroom or at distance.

The continuing training should be updated when new instructions are issued which are related to the material, tools, documentation and manufacturer's or NMAA's directives.

E) Guidelines for preparing the content of Phase 2 courses.

The following guidelines should be taken into consideration when the phase 2 training programme is being established:

- a) understanding of the background and the concept of fuel tank safety,
- b) how the mechanics can recognise, interpret and handle the improvements in the Instructions for Continuing Airworthiness that have been made or are being made regarding fuel tank systems,
- c) awareness of any hazards especially when working on the fuel system, and when the Flammability Reduction System using nitrogen is installed.

Paragraphs a), b) and c) above should be introduced in the training programme addressing the following issues:

- i) The theoretical background behind the risk of fuel tank safety: the explosions of mixtures of fuel and air, the behaviour of those mixtures in an aviation environment, the effects of temperature and pressure, energy needed for ignition, etc., the 'fire triangle', - Explain 2 concepts to prevent explosions:
 - (1) ignition source prevention and
 - (2) flammability reduction,

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- ii) The major accidents related to fuel tank systems, the accident investigations and their conclusions,
- iii) SFAR 88 of the FAA and JAA Interim Policy INT POL 25/12: ignition prevention program initiatives and goals, to identify unsafe conditions and to correct them, to systematically improve fuel tank maintenance),
- iv) Explain briefly the concepts that are being used: the results of SFAR 88 of the FAA and JAA INT/POL 25/12: modifications, airworthiness limitations items and CDCCL,
- v) Where relevant information can be found and how to use and interpret this information in the applicable maintenance data as defined in EMAR M.A.401,
- vi) Fuel Tank Safety during maintenance: fuel tank entry and exit procedures, clean working environment, what is meant by configuration control, wire separation, bonding of components etc.,
- vii) Flammability reduction systems when installed: reason for their presence, their effects, the hazards of a Flammability Reduction System (FRS) using nitrogen for maintenance, safety precautions in maintenance/working with an FRS,
- viii) Recording maintenance actions, recording measures and results of inspections.

The training should include a representative number of examples of defects and the associated repairs as required by the (M)TC/(M)STC holders maintenance data.

F) Approval of training

For CAMOs the approval of the initial and continuation training programme and the content of the examination can be achieved by the change of the CAME. The CAME should be approved as required by EMAR CAMO.A.300(b) and (c). The necessary changes to the CAME to meet the content of this Appendix should be made and implemented at the time requested by the NMAA.

Appendix XIII to AMC M.A.712(f): Organisational review

NOT APPLICABLE.