สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

Acceptable Means of Compliance and Guidance Material to TCAR AIR Part Continuing Airworthiness (AMC/GM to TCAR AIR Part-M)

AMC/GM to TCAR AIR Part-M
Issue: 01
Revision: 00
Date 15 November 2024

Approved by

Suttipong Kongpool
Director General
The Civil Aviation Authority of Thailand

THAILAND CIVIL AVIATION REGULATION (TCAR)

INTENTIONALLY LEFT BLANK

RECORD OF REVISIONS

Revision No.	Date (DD-MMM-YYYY)	Subject	Insert By (Department)
00	15 NOV 2024	Initial Issue	AIR

INTENTIONALLY LEFT BLANK

LIST OF EFFECTIVE PAGES

Change and amendment bar is placed against each paragraph affected.

Page No.	Revision No.	Date
1	00	15 NOV 24
2	00	15 NOV 24
3	00	15 NOV 24
4	00	15 NOV 24
5	00	15 NOV 24
6	00	15 NOV 24
7	00	15 NOV 24
8	00	15 NOV 24
9	00	15 NOV 24
10	00	15 NOV 24
11	00	15 NOV 24
12	00	15 NOV 24
13	00	15 NOV 24
14	00	15 NOV 24
15	00	15 NOV 24
16	00	15 NOV 24
17	00	15 NOV 24
18	00	15 NOV 24
19	00	15 NOV 24
20	00	15 NOV 24
21	00	15 NOV 24
22	00	15 NOV 24
23	00	15 NOV 24
24	00	15 NOV 24
25	00	15 NOV 24
26	00	15 NOV 24
27	00	15 NOV 24
28	00	15 NOV 24
29	00	15 NOV 24
30	00	15 NOV 24
31	00	15 NOV 24

Page No.	Revision No.	Date
32	00	15 NOV 24
33	00	15 NOV 24
34	00	15 NOV 24
35	00	15 NOV 24
36	00	15 NOV 24
37	00	15 NOV 24
38	00	15 NOV 24
39	00	15 NOV 24
40	00	15 NOV 24
41	00	15 NOV 24
42	00	15 NOV 24
43	00	15 NOV 24
44	00	15 NOV 24
45	00	15 NOV 24
46	00	15 NOV 24
47	00	15 NOV 24
48	00	15 NOV 24
49	00	15 NOV 24
50	00	15 NOV 24
51	00	15 NOV 24
52	00	15 NOV 24
53	00	15 NOV 24
54	00	15 NOV 24
55	00	15 NOV 24
56	00	15 NOV 24
57	00	15 NOV 24
58	00	15 NOV 24
59	00	15 NOV 24
60	00	15 NOV 24
61	00	15 NOV 24

INTENTIONALLY LEFT BLANK

TABLE OF CONTENT

INTRODUCTION

The acceptable means of compliance and guidance material to be used for the continuing airworthiness of aircraft and aeronautical products, parts and appliances in accordance with TCAR AIR Part-M are those laid down in this document.

Acceptable Means of Compliance (AMC) are non-binding. The AMC serves as a means by which the requirements contained in the Basic Regulation, and the Implementing Rules (IR), can be met. However, applicants may decide to show compliance with the requirements using other means. Organisations may propose alternative means of compliance. 'Alternative Means of Compliance' are those that propose an alternative to an existing AMC. Those Alternative Means of Compliance proposals must be accompanied by evidence of their ability to meet the intent of the IR. Use of an existing AMC gives the user the benefit of compliance with the IR.

Guidance Material (GM) is non-binding explanatory and interpretation material on how to achieve the requirements contained in the Basic Regulation, the IRs, the AMCs and the Certification Specifications (CS). It contains information, including examples, to assist the user in the interpretation and application of the Basic Regulation, its IRs, AMCs and the CSs.

Any instructions other than the AMC and GM, including user guides, forms, and templates, that are published by the CAAT and provide specific details relevant to the provisions outlined in this document should be acknowledged as an essential and integral part of this document. These associated instructions provide supplementary information and guidance that serve to enhance the comprehension and implementation of the provisions, ensuring compliance with relevant regulations.

AMC AND GM TO TCAR AIR PART-M

SUBPART A — GENERAL

- reserved -

SUBPART B — ACCOUNTABILITY

GM M.A.201 Responsibilities

Quick summary table

Select your type of operation and your category of aircraft			Complex motor-powered aircraft		Other-than-complex motor-powered aircraft (aircraft subject to Part-ML are excluded here)	
			Is a CAMO or CAO required for the management of continuing airworthiness?	Is maintenance by a maintenance organisation required?	Is a CAMO or CAO required for the management of continuing airworthiness?	Is maintenance by a maintenance organisation required?
Commercial Operation	Commercial Air Transport (CAT)	Aircraft Operated by AOC holder	Yes, a CAMO is required and it shall be part of the AOC (M.A.201(e))	Yes, maintenance by a Part-145 organisation is required (M.A.201(e))	Yes, a CAMO is required and it shall be part of the AOC (M.A.201(e))	Yes, maintenance by a Part-145 organisation is required (M.A.201(e))
	Commercial other than CAT	Commercial Specialised Operation	Yes, a CAMO is required (M.A.201(f))	Yes, maintenance by a Part-145 organisation is required (M.A.201(f))	Yes, a CAMO or CAO is required (M.A.201(h))	Yes, maintenance by a CAO or Part-145 organisation is required (M.A.201(h))
		Commercial Training Organisation (ATOs)	Yes, a CAMO is required (M.A.201(f))	Yes, maintenance by a Part-145 organisation is required (M.A.201(f))	Yes, a CAMO or CAO is required (M.A.201(h))	Yes, maintenance by a CAO or Part-145 organisation is required (M.A.201(h))
Other than commercial operation including limited operations			Yes, a CAMO is required (M.A.201(g))	Yes, maintenance by a Part-145 organisation is required (M.A.201(g))	No, a CAMO or CAO is not required (M.A.201(i))	No, maintenance by a CAO or Part-145 organisation is not required (M.A.201(i))

GM M.A.201(e) Responsibilities

The performance of ground de-icing and anti-icing activities does not require a Part-145 maintenance organisation approval. Nevertheless, inspections required to detect and, when necessary, remove de-icing and/or anti-icing fluid residues are considered maintenance. Such inspections may only be carried out by suitably authorised personnel.

AMC M.A.201(e)2 Responsibilities

1. An AOC holder operated in accordance with TCAR OPS only needs to hold a CAMO approval as part of its air operator certificate (AOC) for the management of the continuing airworthiness of the aircraft listed on its AOC. The approval to carry out airworthiness reviews is optional.
2. Part-M does not provide for CAMOs to be independently approved to perform continuing airworthiness management tasks on behalf of AOC holders in accordance with TCAR OPS. The approval of such activity is vested in the AOC.
3. The operator is ultimately responsible and, therefore, accountable for the airworthiness of its aircraft.

AMC M.A.201(h) Responsibilities

1. Reference to aircraft includes the components fitted to or intended to be fitted to the aircraft.
2. The performance of ground de-icing and anti-icing activities does not require a Part-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 may only be carried out by suitably authorised personnel.
3. The requirement means that the operator is responsible for determining what maintenance is required, when it has to be performed and by whom and to what standard, in order to ensure the continued airworthiness of the aircraft being operated.
4. An operator should therefore have adequate knowledge of the design status (type specification, customer options, airworthiness directives (AD), airworthiness limitations contained in airworthiness standards acceptable to CAAT, fuel tank system airworthiness limitations including Critical Design Configuration Control Limitations (CDCCL) modifications, major repairs, operational equipment) and required and performed maintenance. The status of aircraft design and maintenance should be adequately documented to support the performance of the quality system.
5. An operator should establish 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.
6. The requirement does not mean that an operator performs the maintenance (this is to be done by a maintenance organisation approved under Part-145) but that the operator carries the responsibility for the airworthy condition of aircraft it operates and thus should be satisfied before the intended flight that all required maintenance has been properly carried out.
7. When an operator is not appropriately approved in accordance with Part-145, the operator should provide a clear work order to the maintenance contractor. The fact that an operator has contracted a maintenance organisation approved under Part-145 should not prevent it from checking at 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.

GM M.A.201(i) Aircraft maintenance programme

If an owner decides not to make a contract in accordance with M.A.201(i), the owner is fully responsible for the proper accomplishment of the corresponding tasks. As a consequence, it is recommended that the owner properly self-assesses its own competence to accomplish them or otherwise seeks the proper expertise.

AMC M.A.201(i)3 Responsibilities

LIMITED CONTRACT FOR THE DEVELOPMENT OF THE AMP

The limited contract for the development and, when applicable, processing of the approval of the aircraft maintenance programme should cover the responsibilities related to M.A.302(d), M.A.302(f) and M.A.302(h).

GM1 M.A.201(k) Responsibilities

USE OF AIRCRAFT INCLUDED IN AN AOC FOR NON-COMMERCIAL OPERATIONS OR SPECIALISED OPERATIONS ACCORDING TO TCAR OPS.

As point (k) is not a derogation from the previous points of M.A.201, points M.A.201(f), (g), (h) and (i) are still applicable.

AMC M.A.202(a) Occurrence reporting

Accountable persons or organisations should ensure that the Type Certificate holder receives adequate reports of occurrences for that aircraft type, to enable it to issue appropriate service instructions and recommendations to all owners or operators.

Liaison with the Type Certificate 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 continuing airworthiness management or maintenance organisation 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.

In respect of maintenance, reporting a condition which endangers flight safety is normally limited to:

- serious cracks, permanent deformation, burning or serious corrosion of structure found during scheduled maintenance of the aircraft or component.
- failure of any emergency system during scheduled testing.

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:

- reporter or organisation’s name and approval reference if applicable,
- 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,
- details of the occurrence.

Guidance Material on Reporting of Civil Aviation Occurrences (CAAT-SMD-OCC) provides further guidance on occurrence reporting.

SUBPART C — CONTINUING AIRWORTHINESS

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

PRE-FLIGHT INSPECTION

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 and its emergency equipment 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.

   (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 approved maintenance programme.

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 determine where the necessary uplift or inflation results from an abnormal consumption and possibly requires additional maintenance action by the approved maintenance organisation or certifying staff as appropriate.

3. In the case of an AOC holder in accordance with TCAR OPS, the CAMO should publish guidance to maintenance and flight personnel and any other personnel performing pre-flight inspection tasks, as appropriate, defining responsibilities for these actions and, where tasks are contracted to other organisations, how their accomplishment is subject to the quality system required by CAMO.A.200. It should be demonstrated to CAAT 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 continuing airworthiness management exposition.

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

1. The operator 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), configuration deviation list (CDL) or maintenance data, as appropriate. Also, that such defect rectification cannot be postponed unless agreed by the operator and in accordance with a procedure approved by CAAT.

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 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. In the case of aircraft used by AOC holder in accordance with TCAR OPS and of complex motor-powered aircraft, 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 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 maintenance programme efficiency.

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

MAINTENANCE IN ACCORDANCE WITH THE AMP

The owner, CAO or CAMO, as applicable, should have a system to ensure that all aircraft maintenance checks are performed within the limits prescribed by the approved aircraft maintenance programme 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 CAAT.

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

The operator or the contracted CAMO as applicable should have a system to analyse the effectiveness of the maintenance programme, with regard to spares, established defects, malfunctions and damage, and to amend the maintenance programme 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), MNPS, low visibility operation (LVO), RNAV, etc.

Any other continuing airworthiness requirement established by CAAT includes Type Certificate related requirements such as: certification maintenance requirements (CMR), life-limited parts, airworthiness limitations contained in airworthiness standards acceptable to CAAT in accordance with CAAT Requirement No.17, fuel tank system airworthiness limitations including Critical Design Configuration Control Limitations (CDCCL), etc.

The operator is responsible for the incorporation of operational directives (ODs) 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 ODs should be detailed in an arrangement or common procedure.

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

MAINTENANCE CHECK FLIGHTS (MCFs)

(a) The definition of and operational requirements for MCFs are laid down in CAAT requirements and are carried out under the control and responsibility of the aircraft operator. 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 operator. The operator 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 after incomplete maintenance, when in compliance with M.A.801(f) or 145.A.50(e), should be issued by the maintenance organisation and the aircraft can be flown for this purpose under its airworthiness certificate.

   Due to incomplete maintenance, for aircraft used in commercial air transport, it is advisable to open a new entry on 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 operator 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 certificate of release to service is issued and the aircraft airworthiness certificate 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 certificate of release to service is issued before the flight. The airworthiness certificate is valid for the flight. An open entry requesting this flight may be recorded in the aircraft technical log.

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 special flight permit is issued in accordance with CAAT requirements. After the flight and the corresponding maintenance work, the aircraft can be released to service and continue to operate under its original certificate of airworthiness.

(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

BASIC PRINCIPLES

1. The term 'maintenance programme' is intended to include scheduled maintenance tasks, the associated procedures and standard maintenance practises. The term 'maintenance schedule' is intended to embrace the scheduled maintenance tasks alone.
2. The aircraft should only be maintained to one approved maintenance programme at a given point in time. Where an owner or operator wishes to change from one approved programme to other, a transfer check or inspection may need to be performed in order to implement the change.
3. The maintenance programme details should be reviewed at least annually. As a minimum, revisions of documents affecting the programme basis need to be considered by the owner or operator for inclusion in the maintenance programme during the annual review. Applicable mandatory requirements for compliance with its design approval should be incorporated into the owner or operator's maintenance programme as soon as possible.
4. The aircraft maintenance programme should contain a preface which will define the maintenance programme 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. Appendix IA to AMC M.A.302 provide detail information and procedure for permitted variations to maintenance periods.
5. Repetitive maintenance tasks derived from modifications and repairs should be incorporated into the approved maintenance programme.
6. Appendix I to AMC M.A.302 provides detailed information on the contents of an approved aircraft maintenance programme.

GM M.A.302(a) Aircraft maintenance programme

A maintenance programme may indicate that it applies to several aircraft registrations as long as the maintenance programme clearly identifies the effectivity of the tasks and procedures that are not applicable to all of the listed registrations.

AMC M.A.302(d) Aircraft maintenance programme

AMP BASIS AND ASSOCIATED PROGRAMMES

1. An aircraft maintenance programme should normally be based upon the maintenance review board (MRB) report where applicable, the maintenance planning document (MPD), the relevant chapters of the maintenance manual or any other maintenance data containing information on scheduling. Furthermore, an aircraft maintenance programme should also take into account any maintenance data containing information on scheduling for components.
2. Instructions issued by CAAT 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 owner/operator directly. These instructions may be issued by CAAT in the following cases:
   - in the absence of specific recommendations of the Type Certificate Holder.
   - to provide alternate instructions to those described in the subparagraph 1 above, with the objective of providing flexibility to the operator.

3. Where an aircraft type has been subjected to the MRB report process, an operator should normally develop the initial aircraft maintenance programme based upon the MRB report.
4. Where an aircraft is maintained in accordance with an aircraft maintenance programme 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 aircraft maintenance programme.
5. Aircraft maintenance programmes 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 aircraft maintenance programme. This does not prevent the approved aircraft maintenance programme 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 aircraft maintenance programmes, not developed from the MRB process, utilise reliability programmes. Such reliability programmes should be considered as a part of the approved maintenance programme.
7. Alternate and/or additional instructions to those defined in paragraphs M.A.302(d)(1) and (2), proposed by the owner or the operator, may include but are not limited to the following:
   - Escalation of the interval for certain tasks based on reliability data or other supporting information. The escalation of these tasks is directly approved by CAAT.
   - More restrictive intervals than those proposed by the Type Certificate holder as a result of the reliability data or because of a more stringent operational environment.
   - Additional tasks at the discretion of the operator.

AMC M.A.302(g) Aircraft maintenance programme

RELIABILITY PROGRAMMES

1. Reliability programmes should be developed for aircraft maintenance programmes based upon maintenance steering group (MSG) logic or those that include condition monitored components or that do not contain overhaul time periods for all significant system components.
2. Reliability programmes need not be developed for aircraft not considered as complex motor-powered aircraft or that contain overhaul time periods for all significant aircraft system components.
3. The purpose of a reliability programme is to ensure that the aircraft maintenance programme 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 maintenance programme.
6. Appendix I to AMC M.A.302 gives further guidance.

AMC M.A.304 Data for modifications and repairs

A person or 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 could involve any one or more of the following options; repair by replacement of damaged parts, requesting technical support from the Type Certificate holder or from a design organisation acceptable to CAAT under TCAR AIR Part-21.

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 owner/CAO/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 aircraft maintenance programme 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 aircraft maintenance programme requires the permanent removal from service when, or before, the specified mandatory life limitation in accordance with CAAT requirements 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.

(e) The term 'time-controlled components' embraces any component for which the maintenance schedule of the aircraft maintenance programme requires periodically the removal for maintenance to be performed in an appropriate approved organisation for maintenance in 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 CAAT requirements, 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 aircraft maintenance programme 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 aircraft maintenance programme. 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 person or organisation responsible for the aircraft continuing airworthiness in accordance with M.A.201 in order that they may be able to fulfil their obligations under Part-M.

These are only a part of the detailed maintenance records required to be kept by a maintenance organisation under, CAO.A.090(a) or 145.A.55(a). 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 person or organisation responsible for the aircraft continuing airworthiness in accordance with 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 person or organisation responsible in accordance with M.A.201. However, dimensional information contained

in the task card sign-off or work pack may be requested by the owner/CAO/CAMO in order to verify and demonstrate the effectiveness of the aircraft maintenance programme.

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

— modifications;

— airworthiness directives;

— repaired and non-repaired damage;

— components referred in 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 under this requirement could be lightning strikes, hard landings, long-term 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, weight 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 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 certificate of release to service, should be processed in the record system.

(b) For components with airworthiness limitations, this information should be found on the authorised release certificate (CAAT Form 1 or equivalent). For life-limited parts, some relevant information required by 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 owners and operators 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 Airworthiness Directives, and measures mandated by CAAT in immediate reaction to a safety problem, should identify the product/component, the applicable Airworthiness Directives including revision or amendment numbers and the date on which the status was updated. For the purpose of assessing the Airworthiness Directive status, there is no need to list those Airworthiness Directives which are superseded or cancelled.

(b) If the Airworthiness Directive 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 Airworthiness Directives should include the release to service date on which the Airworthiness Directive or measure was accomplished (the date the certificate of release to service was issued), and where the Airworthiness Directive 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 Airworthiness Directive or measure was accomplished and/or the due limit in the appropriate parameter. For repetitive Airworthiness Directives 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 Airworthiness Directive or measure has been accomplished, where a choice is available in the Airworthiness Directive or measure.

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

(f) When the Airworthiness Directive 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 certificate of release to service 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 aircraft maintenance programme. The status should include the reference to the data in accordance with 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 also be necessary.

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

AIRCRAFT MAINTENANCE PROGRAMME

(a) The current status of compliance with the aircraft maintenance programme means the last and next accomplishment data (referring to the applicable parameter) for the tasks specified in the maintenance schedule of the aircraft maintenance programme. 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;

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

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

TASKS CONTROLLED AT COMPONENT LEVEL

(a) The maintenance schedule of the aircraft maintenance programme may include tasks controlled at component level coming from a mandatory requirement in accordance with its state of design requirements 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 (2) and (3) above is controlled at aircraft level by the aircraft maintenance programme and it has not been removed since the task was last accomplished, then its status of compliance with M.A.305(d)2 is already demonstrated by the aircraft records.

Note: The maintenance in accordance:

— with (1) and (2) above assumes a predictable deterioration of the component: the overall reliability invariably decreases with age; and

— with (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 contained the aircraft maintenance programme (AMP) that is recommended by the design approval holder (DAH) and controlled at component level, although such component does not qualify as a time-controlled component, the status of the component may be needed to show that all the maintenance due on the aircraft according to the aircraft maintenance programme has been carried out. There is no a specific requirement to keep the CAAT Form 1 or equivalent or any other detailed maintenance records.

(c) For aircraft maintenance programmes 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

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 a CAAT Form 1 in accordance with M.A.502(d):

	Primary maintenance process	Continuing airworthiness records
Life-limited part		– Current status (M.A.305(d)(1)); – In-service history record (M.A.305(e)(3)(i)); – CAAT Form 1 and detailed maintenance records for last scheduled maintenance and subsequent unscheduled maintenance (M.A.305(e)(3)(ii)), including modifications and repairs (M.A.305(e)(2)(ii)).
Time-controlled component	Hard time	– Current status (M.A.305(d)(2)); – CAAT Form 1 and detailed maintenance records for last scheduled maintenance and subsequent unscheduled maintenance (M.A.305(e)(3)(ii)), including modifications and repairs (M.A.305(e)(2)(ii)).
	On condition	– Current status (M.A.305(d)(2)); and – CAAT Form 1 and detailed maintenance records for last scheduled maintenance and subsequent unscheduled maintenance (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 aircraft maintenance programme (M.A.305(c)(3) and M.A.305(e)(2)(iii)). If the maintenance was performed off wing, the CAAT Form 1 needs to be kept.
Condition monitoring		CAAT Form 1 does not need to be kept unless this is the means to fulfil another requirement; for example, an Airworthiness Directive compliance.
LA1 and LA2 aircraft: any component that is fitted without a CAAT Form 1 in accordance with M.A.502(d)		The certificate of release to service and owner's acceptance statement (M.A.305(e)(3)(iii)).

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

INFORMATION TECHNOLOGY (IT) SYSTEMS AND FORM OF RECORDS

(i) 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.

(ii) '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 Airworthiness Directive, 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.

(iii) Form of records

Producing and/or keeping continuing airworthiness records in a form acceptable to CAAT 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).

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.

(iv) 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.

(v) 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.

(vi) 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 CAAT has accepted a system for digitised record-keeping satisfying the above, the paper document may be permanently disposed of.

(vii) 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 and reference to records maintained by individual mechanics, etc. When reconstruction has been done and the record is still incomplete, the owner/operator 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 CAAT for acceptance. CAAT 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 Part-M.

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

(a) CAAT 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 Airworthiness Directive 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) A CAAT 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) CAAT Form 1 or equivalent is not required to be kept for the 'condition monitoring' process of components unless this is the means to fulfil another requirement quoted in M.A.305 (e.g. demonstration of Airworthiness Directive 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), CAAT Form 1 or equivalent is not required to be kept.

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

When the owner or organisation responsible for the aircraft continuing airworthiness arranges for the relevant maintenance organisation to retain copies of the continuing airworthiness records on their behalf, the owner or organisation responsible for the aircraft continuing airworthiness will continue to be responsible for the retention of records. If they cease to be the owner or organisation responsible for the aircraft continuing airworthiness of the aircraft, they also remain responsible for transferring the records to the new owner or organisation.

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

CONTENT OF INFORMATION ON THE ATL SYSTEM

For CAT operations, commercial specialised operations and ATO operations, 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 or galley 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 log book where recorded by another means.

The aircraft technical log system may range from a simple single section document to a complex system containing many sections but in all cases 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 registered name and address of the operator the aircraft type and the complete international 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 certificate of release to service (CRS), for the complete aircraft, issued normally 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 CAAT.

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 CAAT.

(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 or galleys that affect the safe operation of the aircraft or the safety of its occupants that are known to the commander. Provision should be made for the commander to date and sign such entries including, where appropriate, the nil defect state for continuity of the record. 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 a Part-145 maintenance organisation, it is acceptable to use an alternate abbreviated certificate of release to service consisting of the statement ‘Part-145 release to service’ instead of the full certification statement specified in AMC 145.A.50(b)(1). When the alternate abbreviated certificate of release to service is used, the introductory section of the technical log should include an example of the full certification statement from AMC 145.A.50(b)(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 operator'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 the following supplementary information:

— 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 operator'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 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 CAAT.

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

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

Where an owner/operator terminates the operation, all retained continuing airworthiness records should be passed on to the new owner/operator or stored.

A 'permanent transfer' does not generally include the dry lease-out of an aircraft when the duration of the lease agreement is less than 6 months. However, CAAT 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

1. Except as specified in sub-paragraph 2, each person or organisation performing aircraft maintenance should have access to and use:

   (a) the regulations on continuing airworthiness of aircraft, associated AMC's and GM

   (b) all applicable maintenance requirements and notices such as CAAT standards and specifications that have not been superseded by a requirement, procedure or directive;

   (c) all applicable Airworthiness Directives;

   (d) the appropriate sections of the aircraft maintenance programme, aircraft maintenance manual, repair manual, supplementary structural inspection document, corrosion control document, service bulletins, service sheets modification leaflets, non-destructive inspection manual, parts catalogue, Type Certificate data sheets as required for the work undertaken and any other specific document issued by the Type Certificate or supplementary Type Certificate holder's maintenance data, except that in the case of operator or customer provided maintenance data it is not necessary to hold such provided data when the work order is completed.

2. In addition to sub-paragraph 1, for components each organisation performing aircraft maintenance should hold and use the appropriate sections of the vendor maintenance and repair manual, service bulletins and service letters plus any document issued by the Type Certificate holder as maintenance data on whose product the component may be fitted when applicable, except that in the case of operator or customer provided maintenance data it is not necessary to hold such provided data when the work order is completed.

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

(a) The maintenance data referred to in M.A.401(b)(3) and (4) may have been prepared by various organisations, but in any case it needs to be issued by, referenced by, or acceptable to the organisation responsible for the design in accordance with TCAR AIR Part 21 (e.g. Type Certificate holder, Supplemental Type Certificate holder, TSO holder, repair design approval holder).

(b) Depending on the product or component subject to maintenance and depending on how this maintenance is released, different maintenance data may be needed during the performance of maintenance.

(c) With respect to aircraft maintenance, applicable maintenance data typically includes the following documents issued by the aircraft Type Certificate holder or the design approval holder (DAH): manufacturer recommended maintenance programme (e.g. MPD, MRBR), aircraft maintenance manual including the airworthiness limitations section, repair manual, supplemental structural inspection document, corrosion prevention and/or control document, service bulletins, wiring diagram manuals, troubleshooting manual, service letter/instructions, illustrated parts catalogue, and any other specific maintenance instruction issued by the aircraft Type Certificate holder or by the Design Approval holder.

(d) With respect to engine maintenance, applicable maintenance data typically includes the engine maintenance and/or overhaul manual including the airworthiness limitations section, wiring diagrams, parts catalogue, troubleshooting manual issued by the engine Type Certificate holder (or aircraft Type Certificate holder if the engine is certified as part of the aircraft) or by the Design Approval holder.

With respect to APU maintenance, applicable maintenance data typically includes APU maintenance and/or overhaul manual, wiring diagrams, parts catalogue, troubleshooting manual issued by the aircraft Type Certificate holder, or issued by the APU manufacturer and acceptable to the Type Certificate holder of the aircraft on which it is installed or to the Design Approval holder.

(e) With respect to maintenance of components other than engine/APU, applicable maintenance data typically includes the component maintenance (and/or repair) manual, troubleshooting manual and other maintenance instructions produced by the component manufacturer, when they are acceptable to the TCH of the product in which the component is to be installed or to the DAH, or when they form part of (or are referenced together with) the product ICA. In the case of propellers, maintenance data includes its ICA.

When in compliance with M.A.502(b) or M.A.502(c), it is possible to conduct maintenance on the component while installed on the aircraft or engine or APU, or temporarily removed to gain access. In such case, the applicable maintenance data may also include, as applicable, aircraft maintenance data or engine/APU maintenance data.

(f) With respect to maintenance considered to be specialised services (such as non-destructive testing (NDT)), applicable maintenance data typically includes non-destructive testing or inspection manual, and all applicable specialised service(s) process instructions issued or specified by the DAH.

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

COMPONENT MANUFACTURER MAINTENANCE INSTRUCTIONS

The maintenance instructions published by the component manufacturers may be considered acceptable to the DAH – and hence may be used as maintenance data for maintenance on components approved for installation by the DAH – when they are referenced as additional or optional maintenance information together with the ICA, or when documented by a list by that DAH.

AMC M.A.401(c) Maintenance data

1. Data being made available to personnel maintaining aircraft means that the data should be available in close proximity to the aircraft or component being maintained, for mechanics and certifying staff to perform maintenance.
2. Where computer systems are used, the number of computer terminals should be sufficient in relation to the size of the work programme to enable easy access, unless the computer system can produce paper copies. Where microfilm or microfiche readers/printers are used, a similar requirement is applicable.
3. Maintenance tasks should be transcribed onto the work cards or worksheets and subdivided into clear stages to ensure a record of the accomplishment of the maintenance task. Of particular importance is the need to differentiate and specify, when relevant, disassembly, accomplishment of task, reassembly and testing. In the case of a lengthy maintenance task involving a succession of personnel to complete such task, it may be necessary to use supplementary work cards or worksheets to indicate what was actually accomplished by each individual person. A worksheet or work card system should refer to particular maintenance tasks.
4. The workcard/worksheet system may take the form of, but is not limited to, the following:
   - a format where the mechanic writes the defect and the maintenance action taken together with information of the maintenance data used, including its revision status,
   - an aircraft log book that contains the reports of defects and the actions taken by authorised personnel together with information of the maintenance data used, including its revision status
   - for maintenance checks, the checklist issued by the manufacturer (i.e., 100H checklist, Revision 5, Items 1 through 95)
5. Maintenance data should be kept up to date by:
   - subscribing to the applicable amendment scheme,
   - checking that all amendments are being received,
   - monitoring the amendment status of all data.

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

1. Maintenance should be performed by persons authorised to issue a certificate of release to service or under the supervision of persons authorised to issue a certificate of release to service. Supervision should be to the extent necessary to ensure that the work is performed properly and the supervisor should be readily available for consultation.

2. The person authorised to issue a certificate of release to service should ensure that:

   (a) each person working under supervision has received appropriate training or has relevant previous experience and is capable of performing the required task; and

   (b) each person who performs specialised tasks, such as welding, is qualified in accordance to an officially recognised standard.

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

In the case of limited Pilot-Owner maintenance as specified in M.A.803, any person maintaining an aircraft which they own or jointly own, provided they hold a valid pilot licence with the appropriate type or class rating, may perform the limited Pilot-owner maintenance tasks in accordance with appendix V to Part-M

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

The general maintenance and inspection standards applied to individual maintenance tasks should meet the recommended standards and practices of the organisation responsible for the type design, which are normally published in maintenance manuals. In the absence of maintenance and inspection standards published by the organisation responsible for the type design, maintenance personnel should refer to the relevant aircraft airworthiness standards and procedures published or used as guidance by CAAT. The maintenance standards used should contain methods, techniques and practices acceptable to CAAT for the maintenance of aircraft and its components.

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

When performing maintenance, personnel are required to use the tools, equipment and test apparatuses necessary to ensure completion of work in accordance with accepted maintenance and inspection standards. Inspection, service or calibration that is performed on a regular basis should be performed in accordance with the equipment manufacturers' instructions. All tools requiring calibration should be traceable to an acceptable standard.

In this context, 'officially recognised standards' means those standards established or published by an official body, being either a natural or legal person, and which are widely recognised by the air transport sector as constituting good practice.

If the organisation responsible for the type design involved recommends special equipment or test apparatuses, personnel should use the recommended equipment or apparatuses or equivalent equipment accepted by CAAT.

All work should be performed using materials of such quality and in such a manner that the condition of the aircraft or its components after maintenance is at least equal to its or their original or modified condition (with regard to aerodynamic function, structural strength, resistance to vibration, deterioration and any other qualities affecting airworthiness).

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

The working environment should be appropriate for the maintenance task being performed such that the effectiveness of personnel is not impaired.

(a) Temperature should be maintained such that personnel can perform the required tasks without undue discomfort.

(b) Airborne contamination (e.g. dust, precipitation, paint particles, filings) should be kept to a minimum to ensure aircraft/components surfaces are not contaminated. If this is not possible all susceptible systems should be sealed until acceptable conditions are re-established.

(c) Lighting should be adequate to ensure each inspection and maintenance task can be performed effectively.

(d) Noise levels should not be allowed to rise to the level of distraction for inspection staff or if this is not possible inspection staff should be provided with personnel equipment to reduce excessive noise.

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

Facilities should be provided appropriate for all planned maintenance. This may require aircraft hangars that are both available and large enough for the planned maintenance.

Aircraft component workshops should be large enough to accommodate the components that are planned to be maintained.

Protection from inclement weather means the hangar or component workshop structures should be to a standard that prevents the ingress of rain, hail, ice, snow, wind and dust etc.

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

(a) To minimise the risk of multiple errors and to prevent omissions, the person or organisation performing maintenance should ensure that:

(1) every maintenance task is signed off only after completion;

(2) the grouping of tasks for the purpose of sign-off allows critical steps to be clearly identified; and

(3) any work performed by personnel under supervision (i.e. temporary staff, trainees) is checked and signed off by an authorised person.

(b) To minimise the possibility of an error being repeated in identical tasks that involve removal/installation or assembly/disassembly of several components of the same type fitted to more than one system, whose failure could have an impact on safety, the person or organisation performing maintenance should plan different persons to perform identical tasks in different systems. However, when only one person is available, then this person should perform reinspection of the tasks as described in AMC2 M.A.402(h).

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

CRITICAL MAINTENANCE TASKS

The following maintenance tasks should primarily be reviewed to assess their impact on safety:

(a) tasks that may affect the control of the aircraft, flight path and attitude, such as installation, rigging and adjustments of flight controls;

(b) aircraft stability control systems (autopilot, fuel transfer);

(c) tasks that may affect the propulsive force of the aircraft, including installation of aircraft engines, propellers and rotors; and

(d) overhaul, calibration or rigging of engines, propellers, transmissions and gearboxes

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

INDEPENDENT INSPECTION

(a) What is an independent inspection;

Independent inspection is one possible error-capturing method. It consists of an inspection performed by an ‘independent qualified person’ of a task carried out by an ‘authorised person’, taking into account that:

(1) the ‘authorised person’ is the person who performs the task or supervises the task and assumes the full responsibility for the completion of the task in accordance with the applicable maintenance data;

(2) the ‘independent qualified person’ is the person who performs the independent inspection and attests the satisfactory completion of the task and that no deficiencies have been found. The

'independent qualified person' does not issue a certificate of release to service, therefore they are not required to hold certification privileges;

(3) the certificate of release to service is issued by the 'authorised person' after the independent inspection has been carried out satisfactorily;

(4) the work card system should record the identification of each person, the date and the details of the independent inspection, as necessary, before the certificate of release to service is issued.

(b) Qualifications of personnel performing independent inspections

(1) When the work is performed by and approved maintenance organisation (Part-CAO and Part-145) then the organisation should follow the requirement in TCAR AIR Part-CAO or Part-145 as applicable.

(2) When the work is performed outside an approved maintenance organisation (Part-CAO and Part-145)

(i) the 'independent qualified person' should hold:

(A) a TCAR PEL Part-66 licence in any category or

(B) a valid pilot licence for the aircraft type issued in accordance CAAT requirements;

(ii) additionally, the 'authorised person' should assess the qualifications and experience of the 'independent qualified person' taking into account that the 'independent qualified person' should have received training and have experience satisfactory diagnosis of the cause in the particular task. It should not be acceptable that the 'authorised person' shows the 'independent qualified person' how to perform the inspection once work has been already finalised.

(c) How should independent inspection be performed

Independent inspection should ensure for example correct assembly, locking and sense of operation. When inspecting control systems that have undergone maintenance, the 'independent qualified person' should consider the following points independently:

(1) all those parts of the system that have actually been disconnected or disturbed should be inspected for correct assembly and locking;

(2) the system as a whole should be inspected for full and free movement over the complete range;

(3) cables should be tensioned correctly with adequate clearance at secondary stops;

(4) the operation of the control system as a whole should be observed to ensure that the controls are operating in the correct sense;

(5) if different control systems are interconnected so that they affect each other, all the interactions should be checked through the full range of the applicable controls; and

(6) software that is part of the critical maintenance task should be checked, for example version and compatibility with the aircraft configuration.

(d) What to do in unforeseen cases when only one person is available

REINSPECTION:

(1) Reinspection is subject to the same conditions as the independent inspection is, except that the 'authorised person' performing the maintenance task is also acting as 'independent qualified person' and performs the inspection.

(2) For critical maintenance tasks, reinspection should only be used in unforeseen circumstances when only one person is available to carry out the task and perform the independent inspection.

The circumstances cannot be considered unforeseen if the person or organisation has not assigned a suitable 'independent qualified person' to that particular task.

(3) The certificate of release to service is issued by the 'authorised person' after the reinspection has been performed satisfactorily.

(4) The work card system should record the identification of the 'authorised person' and the date and the details of the reinspection, as necessary, before the certificate of release to service is issued.

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

Several data sources may be used for the identification of critical maintenance tasks, such as:

— information from the design approval holder;

— accident reports;

— investigation and follow-up of incidents;

— occurrence reporting;

— flight data analysis;

— results of audits;

— normal operations monitoring schemes;

— feedback from training; and

— information exchange systems.

AMC1 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.

AMC1 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

CAAT FORM 1 OR EQUIVALENT

a document equivalent to a CAAT Form 1 may be:

(a) a release document issued by an organisation under the terms of a bilateral agreement signed by CAAT;

(b) For used parts, an authorised release certificate issued by an organisation approved by a competent authority acceptable to CAAT according to standards that are not lower than TCAR AIR Part-145. The list of Authorised Release Certificates acceptable to The CAAT is available in The Notification of The Civil Aviation Authority of Thailand on Acceptance of Foreign Authorised Release Certificates.

(c) For the new parts, The list of Authorised Release Certificates issued in accordance with applicable production standards and certifying that the parts have been manufactured in conformity to approved design data and are in a condition for safe operation acceptable to The CAAT is available in The Notification of The Civil Aviation Authority of Thailand on Acceptance of Foreign Authorised Release Certificates.

(d) For new PMA Parts (Parts designed and manufactured in the United States of America under the Parts Manufacturer Approval), a FAA Form 8130-3 will be considered as equivalent only if it is a non-critical component. The mention that the part is a non-critical component shall be contained in "Remarks" block of the authorised release certificate.

Any item in storage without a CAAT Form 1 or equivalent cannot be installed on aircraft registered in the Kingdom of Thailand unless a CAAT Form 1 is issued for such item by an appropriately approved maintenance organisation in accordance with AMC1 CAO.A.070(a) or AMC2 145.A.50(d).

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

UNSERVICEABLE COMPONENTS

(a) The person or organisation that performs maintenance should ensure the proper identification of any unserviceable components. The unserviceable status of the component should be clearly declared on a tag together with the component identification data and any information that is useful to define actions that are necessary to be taken. Such information should state, as applicable, in-service times, maintenance status, preservation status, failures, defects or malfunctions reported or detected, exposure to adverse environmental conditions, and whether the component is installed on an aircraft that was involved in an accident or incident. Means should be provided to prevent unintentional separation of this tag from the component.

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

(1) expiry of the service life limit as defined in the aircraft maintenance programme;

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

(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

The following types of components should typically be classified as unsalvageable:

(a) components with non-repairable defects, whether visible or not to the naked eye;

(b) components that do not meet design specifications, and cannot be brought into conformity with such specifications;

(c) components subjected to unacceptable modification or rework that is irreversible;

(d) life-limited parts that have reached or exceeded their mandatory life limitation, or have missing or incomplete records;

(e) components whose airworthy condition cannot be restored due to exposure to extreme forces, heat or adverse environmental conditions;

(f) components for which conformity with an applicable airworthiness directive cannot be accomplished;

(g) components for which maintenance records and/or traceability to the manufacturer cannot be retrieved.

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

STANDARD PART

(a) Standard parts are parts that are manufactured in complete compliance with an established industry, agency, competent authority or other government specification which include design, manufacturing, test and acceptance criteria, and uniform identification requirements. The specification should include all the information that is necessary to produce and verify conformity of the part. It should be published so that any party may manufacture the part. Examples of such specifications are National Aerospace Standards (NAS), Army-Navy Aeronautical Standard (AN), Society of Automotive Engineers (SAE), SAE Sematec, Joint Electron Device Engineering Council, Joint Electron Tube Engineering Council, and American National Standards Institute (ANSI), EN Specifications, etc.

(b) To designate a part as a standard part, the Type Certificate holder may issue a standard parts manual accepted by the competent authority of the original Type Certificate holder or may make reference in the parts catalogue to the specification to be met by the standard part. Documentation that accompanies standard parts should clearly relate to the particular parts and contain a conformity statement plus both the manufacturing and supplier source. Some materials are subject to special conditions, such as storage conditions or life limitation, etc., and this should be included in the documentation and/or the material's packaging.

(c) A CAAT Form 1 or equivalent is not normally issued and, therefore, none should be expected.

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

MATERIAL

(a) Consumable material is any material which is only used once, such as lubricants, cements, compounds, paints, chemical dyes and sealants, etc.

(b) Raw material is any material that requires further work to make it into a component part of the aircraft, such as metals, plastics, wood, fabric, etc.

(c) Material both raw and consumable should only be accepted when satisfied that it is to the required specification. To be satisfied, the material and/or its packaging should be marked with the applicable specification and, where appropriate, the batch number.

(d) Documentation that accompanies all materials should clearly relate to the particular material and contain a conformity statement plus both the manufacturing and supplier source. Some materials are subject to special conditions, such as storage conditions or life limitation, etc., and this should be included in the documentation and/or the material's packaging.

(e) A CAAT Form 1 or equivalent should not be issued for such materials and, therefore, none should be expected. The material specification is normally identified in the (Supplemental) Type Certificate holder's data except in the case where the Agency or the competent authority has agreed otherwise.

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

(a) To ensure that components, standard parts and materials are in satisfactory condition, the persons referred to under M.A.801(b)(2), M.A.801(b)(3), M.A.801(c) or M.A.801(d), or 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 TCAR AIR Part-21 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 as specified in M.A.401(b). 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. When the installation is performed outside a maintenance organisation, that is by the persons referred to in M.A.801(b)(1), M.A.801(b)(2), or M.A.801(c), then these persons are responsible to perform this check before installation. When the installation is performed by an organisation approved in accordance with Part-CAO, then the organisation has to establish procedures to ensure that this check is performed before installation.

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, M.A.502 requirements do not apply to this case.

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

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 and to independent certifying staff, subject to the agreement of:

— CAAT, as responsible for the oversight of the maintenance organisation (refer to 145.1 for Part-145 maintenance organisation), or to CAO.1 for Part CAO maintenance organisations) or,

— CAAT as the State of registry in the case of maintenance performed by independent certifying staff.

This would normally only be permitted by CAAT in the case of simple component maintenance, where CAAT 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 to hold a TCAR PEL Part-66 aircraft maintenance licence.

GM1 M.A.502(e) Component maintenance

A ‘declaration of maintenance accomplished’ is a certificate prepared in any shape/form by the person or organisation that performed any maintenance on the component covered by the certificate and subject to the conditions in M.A.502(e). This person or organisation does not need an approval to perform maintenance in accordance with TCAR AIR Part-145 or Part-CAO or TCAR PEL Part-66. In order for the component to be eligible for installation with a ‘declaration of maintenance accomplished’, this declaration, together with other records, should allow the determination that the component was first installed as ‘new’, as a component referred to in M.A.502(e). Such a component should not be installed in an aircraft if there is information on the certificate which is not readable or not understandable or states that the component is not in a satisfactory condition for operation.

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. Certifying staff outside maintenance organisations (M.A.801(b) 1), or M.A.801(c) that release aircraft maintenance should send, with the agreement of the aircraft owner/lessee, any unserviceable component to a maintenance organisation for controlled storage. Nevertheless, the

person or organisation that declared the component unserviceable may transfer its custody, after identifying it as unserviceable, to the aircraft owner/lessee 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 person or 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 is 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 CAAT.

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

(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 H — CERTIFICATE OF RELEASE TO SERVICE – CRS

AMC M.A.801 Aircraft certificate of release to service after embodiment of a Standard Change or a Standard Repair (SC/SR)

1. Release to service and eligible persons

   Only natural or legal persons entitled to release to service an aircraft after maintenance in accordance with TCAR AIR Part-M, Part-145 or Part-CAO are considered as an eligible installer responsible for the embodiment of a SC/SR when in compliance with applicable requirements.

   For aircraft where there is no TCAR PEL Part-66 license applicable, the release to service of an aircraft after embodiment of a SC/SR is only possible by holders of an appropriate certifying staff on behalf of an Approved Maintenance Organisation (AMO)

   Depending on its nature, for certain SCs/SRs, the Certification Specification might restrict the eligibility for the issuance of the release to service to certain persons.

   Since the design of the SC/SR does not require specific approval, the natural or legal person releasing the aircraft to service after the embodiment of the change or repair takes the responsibility that the applicable Certification Specifications within TCAR AIR Part-21 subpart D and M are fulfilled while being in compliance with TCAR AIR Part-M, Part-145 and/or Part-CAO and not in conflict with Type Certificate holders' data. This includes responsibility in respect of an adequate design, the selection/ manufacturing of suitable parts and their identification, documenting the change or repair, generation or amendment of aircraft manuals and instructions as needed, embodiment of the change/repair, releasing the aircraft to service and record-keeping.

2. Parts and appliances to be installed as part of a SC/SR

   The design of the parts and appliances to be used in a SC/SR is considered a part of the change/repair, and, therefore, there is no need of a specific design approval. However, it is possible that for a particular SC, these Certification Specifications specifically require the use of parts and appliances that meet a technical standard acceptable to CAAT. In this case, when the parts and appliances require to be authorised as an TSO article, other articles recognised as equivalent by means of an international safety agreement.

   Normally, a SC/SR shall not contain specifically designed parts that should be produced by a production organisation. However, in the case that the change or repair would contain such a part, it should be produced by a Production Organisation (POA), with the standards accepted under TCAR AIR Part 21 and delivered with an CAAT Form 1 or equivalent.

   Eligibility for installation of parts and appliances belonging to a SC/SR is subject to compliance with the TCAR AIR Part-21 and Part-M, Part-145 and Part-CAO related provisions, and the situation varies depending on the aircraft in/on which the SC/SR is to be embodied, and who the installer is. The need for an CAAT Form 1 or equivalent is addressed in TCAR AIR Part-21 and Part-M. Furthermore, TCAR AIR Part-145 and Part-CAO contain provisions (i.e. 145.A.42(c) and CAO.A.020(c)) allowing maintenance organisations to fabricate certain parts to be installed in/on the aircraft as part of their maintenance activities.

3. Parts and appliances identification

   The parts modified or installed during the embodiment of the SC/SR need to be permanently marked in accordance with CAAT requirements or State of Manufacture requirements for such part.

4. Documenting the SC/SR and declaring compliance with the Certification Specifications

   In accordance with TCAR AIR Part-M, Part-CAO or Part-145 (e.g. AMC M.A.801 (e) and AMC 145.A.50(b)), the legal or natural person responsible for the embodiment of a change or a repair should

compile details of the work accomplished. In the case of SCs/SRs, this includes, as necessary, based on its complexity, an engineering file containing drawings, a list of the parts and appliances used for the change or repair, supporting analysis and the results of tests performed or any other evidence suitable to show that the design fulfils the applicable Certification Specifications within TCAR AIR Part-21 subpart D and M together with a statement of compliance and amendments to aircraft manuals, to instructions for continuing airworthiness and to other documents such as aircraft parts list, wiring diagrams, etc., as deemed necessary. CAAT Form 123 is prepared for the purpose of documenting the preparation and embodiment of the SC/SR. The aircraft logbook should contain an entry referring to CAAT Form 123; both CAAT Form 123 and the release to service required after the embodiment of the SC/SR should be signed by the same person.

Form 123 and all the records listed on it should follow elementary principles of controlled documentation, e.g. contain reference number of documents, issue dates, revision numbers, name of persons preparing/releasing the document, etc.

5. Record-keeping

The legal or natural person responsible (see paragraph 1. above) for the embodiment of the change/repair should keep the records generated with the SC/SR as required by TCAR AIR Part-M or Part-145 and Part-21 subpart D and M.

In addition, M.A.305 requires that the aircraft owner (or CAMO, if a contract i.a.w. M.A.201 exists) keeps the status of the changes/repairs embodied in/on the aircraft in order to control the aircraft configuration and manage its continuing airworthiness.

With regard to SCs/SRs, the information provided to the owner or CAMO may be listed in Form 123 and should include, as required, a copy of any modified aircraft manual and/or instructions for continuing airworthiness. All this information should normally be consulted when the aircraft undergoes an airworthiness review, and, therefore, a clear system to record the embodiment of SCs/SRs, which is also easily traceable, would be of help during subsequent aircraft inspections.

6. Instructions for continuing airworthiness

As stipulated in M.A.302, the aircraft owner or CAMO needs to assess if the changes in the instructions for continuing airworthiness of the aircraft require to amend the aircraft maintenance programme and to obtain its approval.

7. Embodiment of more than one SC

The embodiment of two or more related SCs in accordance with TCAR AIR Part-21 subpart D and M is permitted as a single change (the use of one Form 123 only) as long as adequate references to and records of all SCs embodied are captured. Restrictions and limitations of the two (or more) SCs would apply. It is permitted to issue a single release to service containing adequate traceability of all the SCs embodied.

8. Acceptable form to be used to record the embodiment of SCs/SRs
CAAT Form 123 — Standard Change/Standard Repair (SC/SR) embodiment record

Standard Change/Standard Repair (SC/SR) embodiment record	1. SC/SR number(s):
2. SC/SR title & description:	
3. Applicability:	
4. List of parts (description/Part-No/Qty):	
5. Operational limitations/affected aircraft manuals. Copies of these manuals are provided to the aircraft owner:	
6. Documents used for the development and embodiment of this SC/SR: * Copies of the documents marked with an asterisk are handed to the aircraft owner.	
7. Instructions for continuing airworthiness. Copies of these manuals are provided to the aircraft owner:	
8. Other information:	
9a. ☐ This SC complies with the criteria established in TCAR AIR Part-21 item 21.A.89G (a)(2).	
9b. ☐ This SR complies with the criteria established in TCAR AIR Part-21 item 21.A.430G (a)(3).	
10. Date of SC/SR embodiment:	11. Identification data and signature of the person responsible for the embodiment of the SC/SR:
12. Signature of the aircraft owner. This signature attests that all relevant documentation is handed over from the issuer of this form to the aircraft owner, and, therefore, the latter becomes aware of any impact or limitations on operations or additional continuing airworthiness requirements which may apply to the aircraft due to the embodiment of the change/repair.	

CAAT Form 123

Notes:

Original remains with the legal or natural person responsible for the embodiment of the SC/SR.

The aircraft owner should retain a copy of this form.

The aircraft owner should be provided with copies of the documents referenced in boxes 5 and 7 and those in box 6 marked with an asterisk '*'.

For box 12, when the aircraft owner has signed a contract i.a.w. M.A.201, it is possible that the Continuing Airworthiness Management Organisation (CAMO) representative signs box 12 and provides all relevant information to the owner before next flight.

Completion instructions:

Use English or the official language of the State of registry to fill in the form.

1. Identify the SC/SR with a unique number and reference this number in the aircraft logbook.
2. Specify the applicable Certification Specifications (CS) chapter including revision (e.g. CS-SCxxxy or CS-SRxxxy) & title. Provide also a short description.
3. Identify the aircraft (a/c) registration, serial number and type.
4. List the parts' numbers and description for the parts installed. Refer to an auxiliary document if necessary.
5. Identify affected aircraft manuals.
6. Refer to the documentation developed to support the SC/SR and its embodiment, including design data required by TCAR AIR Part-21 subpart D and M: design definition, documents recording the showing of compliance with the Certification Specifications or any test result, etc. The documents' references should quote their revision/issue.
7. Identify instructions for continuing airworthiness that need to be considered for the aircraft maintenance programme review.
8. To be used as deemed necessary by the installer.

9a., 9b., 10. and 12. Self-explanatory.

11. Give full name details and certificate reference (of the natural or legal person) used for issuing the aircraft release to service.

AMC M.A.801(b) Aircraft certificate of release

A certificate of release to service is necessary before flight, at the completion of any defect rectification, whilst the aircraft operates a flight between scheduled maintenance checks.

AMC M.A.801(c) Aircraft certificate of release

AIRCRAFT GROUNDED AT OTHER LOCATIONS

1. '3 years of appropriate maintenance experience' means 3 years working in an aircraft maintenance environment on at least some of the aircraft type systems corresponding to the aircraft endorsed on the aircraft maintenance license or on the certifying staff authorisation that the person holds.
2. 'Holding the proper qualifications' means holding either:
   (a) a valid ICAO Annex 1 compliant maintenance license for the aircraft type requiring certification, or;
   (b) a certifying staff authorisation valid for the work requiring certification, issued by an ICAO Annex 8 approved maintenance organisation.

3. - reserved -

AMC M.A.801(e) Aircraft certificate of release

1. The aircraft certificate of release to service should contain the following statement:

   (a) 'Certifies that the work specified except as otherwise specified was carried out in accordance with TCAR AIR Part-M and in respect to that work the aircraft is considered ready for release to service'.

   (b) For a Pilot-owner a certificate of release to service should contain the following statement:

   'Certifies that the limited pilot-owner maintenance specified except as otherwise specified was carried out in accordance with TCAR AIR Part-M and in respect to that work the aircraft is considered ready for release to service'.

2. The certificate of release to service should relate to the task specified in the manufacturer's or operator's instruction or the aircraft maintenance programme which itself may cross-refer to a manufacturer's/operator's instruction in a maintenance manual, service bulletin etc.

3. The date such maintenance was carried out should include when the maintenance took place relative to any life or overhaul limitation in terms of date/flying hours/cycles/ landings etc., as appropriate.

4. When extensive maintenance has been carried out, it is acceptable for the certificate of release to service to summarise the maintenance so long as there is a unique cross-reference to the work-pack containing full details of maintenance carried out. Dimensional information should be retained in the work-pack record.

5. The person issuing the certificate of release to service should use his normal signature except in the case where a computer release to service system is used. In this latter case CAAT will need to be satisfied that only the particular person can electronically issue the release to service. One such method of compliance is the use of a magnetic or optical personal card in conjunction with a personal identity number (PIN) known only to the individual, which is keyed into the computer. A certification stamp is optional.

6. At the completion of all maintenance, owners, certifying staff, operators and maintenance organisations should ensure they have a clear, concise, legible record of the work performed.

7. In the case of an M.A.801(b) 1 release to service, certifying staff should retain all records necessary to prove that all requirements have been met for the issuance of a certificate of release to service.

AMC M.A.801(f) Aircraft certificate of release

INCOMPLETE MAINTENANCE

1. Being unable to establish full compliance with sub-paragraph M.A.801(b) means that the maintenance required by the aircraft owner, CAO or CAMO could not be completed due either to running out of available aircraft maintenance downtime or because the maintenance data requires a flight to be performed as part of the maintenance, as described in paragraph 4.

2. The aircraft owner, CAO or CAMO is responsible for ensuring that all required maintenance has been carried out before flight. Therefore, an aircraft owner, CAO or CAMO should be informed and agree to the deferment of full compliance with M.A.801(b). The certificate of release to service may then be issued subject to details of the deferment, including the aircraft owner, CAO or CAMO authorisation, being endorsed on the certificate.

3. If a CRS is issued with incomplete maintenance a record should be kept stating what action the mechanic, supervisor and certifying staff should take to bring the matter to the attention of the relevant aircraft owner, CAO or CAMO so that the issue may be discussed and resolved with the aircraft owner, CAO or CAMO.

4. Certain maintenance data issued by the design approval holder (e.g. aircraft maintenance manual (AMM)) require that a maintenance task be performed in flight as a necessary condition to complete the maintenance ordered. Within the aircraft limitations, the person authorised to certify the maintenance per M.A.801 should release the incomplete maintenance before this flight. GM M.A.301(i) describes the relations with the aircraft operator, which retains the responsibility for the MCF. After performing the flight and any additional maintenance necessary to complete the maintenance ordered, a certificate of release to service should be issued in accordance with M.A.801.

AMC M.A.801(g) Aircraft certificate of release

'Endangers 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.802 Component certificate of release to service

The purpose of CAAT Form 1 (see also Appendix II to TCAR AIR Part-M) is to release components after manufacture and to release maintenance work carried out on such components under the approval of CAAT, and to allow components that are removed from one aircraft/component to be fitted to another aircraft/component.

When an approved organisation maintains an aircraft component for use by the organisation, a CAAT Form 1 may not be necessary depending upon the organisation's internal release procedures, however, all the information normally required for CAAT Form 1 should be adequately detailed in the certificate of release to service.

AMC M.A.803 Pilot-owner authorisation

1. Privately operated means the aircraft is operated pursuant to M.A.201(i).
2. A Pilot-owner may only issue a CRS for maintenance they have performed.
3. In the case of a jointly-owned aircraft, the maintenance programme should list:
   - The names of all Pilot-owners competent and designated to perform Pilot-owner maintenance in accordance with the basic principles described in Appendix VI of TCAR AIR Part-M. An alternative would be the maintenance programme to contain a procedure to ensure how such a list of competent Pilot-owners should be managed separately and kept current.
   - The limited maintenance tasks they may perform.
4. – reserved –
5. Not holding a valid medical examination does not invalidate the pilot licence (or equivalent) required under M.A.803(a)1 for the purpose of the Pilot-owner authorisation.

SUBPART I — AIRWORTHINESS REVIEW

AMC M.A.901 Aircraft airworthiness review

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

GM M.A.901 Aircraft airworthiness review

Responsibilities of airworthiness review staff:

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

— Airworthiness review staff are responsible for performing both the documentation and the physical survey.

— Procedures must be established by the CAMO or CAO 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 documentation and physical) belongs to the airworthiness review staff, who can go beyond the depth established in the CAME or CAE if they find it necessary. At the end, it is the responsibility of the airworthiness review staff to be satisfied that the aircraft complies with Part-M and is airworthy, and the organisation must ensure that no pressure or restrictions are imposed on the airworthiness review staff when performing their duty.

— An Airworthiness Review report must be produced by the airworthiness review staff, detailing all items checked and the outcome of the review.

— Airworthiness review staff 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 airworthiness review staff 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 airworthiness review staff.

— -reserved-

It is the responsibility of the owner or contracted CAMO or CAO to ensure that the aircraft is fully airworthy at any time.

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.

The support of personnel appropriately qualified in accordance with TCAR PEL Part-66 is necessary when CAAT's airworthiness review staff are 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;
   - M.A.305 aircraft continuing airworthiness record system;
   - 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;
   - Airworthiness Directive status;
   - modification and SB status;
   - modification and repair approval sheets;
   - status of life-limited parts and time-controlled components;
   - relevant CAAT Form 1 or equivalent;
   - mass and balance report and equipment list;
   - aircraft, engine and propeller Type Certificate data sheets.

   As a minimum, sample checks within each document category should be carried out.
2. The CAMO or CAO should develop procedures for the airworthiness review staff to produce a compliance report that confirms the above have been reviewed and found in compliance with Part-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 airworthiness review staff are not appropriately qualified as per TCAR PEL Part-66 in order to release such maintenance, M.A.901(l) requires them to be assisted by such qualified personnel. However, the function of such TCAR PEL Part-66 personnel is limited to performing and releasing the maintenance actions requested by the airworthiness review staff, it not being their function to perform the physical survey of the aircraft.
3. This means that the airworthiness review staff member who is going to sign the airworthiness review report 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 TCAR PEL Part-66 personnel who are not airworthiness review staff. Furthermore, the provision of M.A.901(n) that allows a 90-day anticipation for the physical survey provides enough flexibility to ensure that the airworthiness review staff (ARS) are present.
4. The physical survey may include verifications to be carried out during flight.
5. The CAMO or CAO 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 due date is set up 1 year after the previous due date. As a consequence, when the airworthiness review is anticipated, the next due date of the airworthiness review report is longer than 1 year (up to 90 days longer).

AMC M.A.904(a)1 Airworthiness reviews of aircraft imported into Thailand

In order to allow for possible participation of authority personnel, the applicant should inform CAAT at least 60 days in advance of the time and location of the airworthiness review.

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

WORK TO BE UNDERTAKEN TO ESTABLISH AIRWORTHINESS

1. When performing an airworthiness review of aircraft imported into Thailand the aircraft and the relevant records should be reviewed to determine the work to be undertaken to establish the airworthiness of the aircraft.

2. In determining the work to be undertaken during the airworthiness review on the aircraft, the following should be taken into consideration:

   (a) the information from other country authorities such as export certificates, primary authority information;

   (b) the information on aircraft maintenance history such as continuing airworthiness records, aircraft, engine, propeller, rotor and life limited part log books or cards as appropriate, tech log/flight log/cabin log, list of deferred defects, total flight times and cycles, times and cycles since last maintenance, accident history, former maintenance schedule, former Airworthiness

Directive compliance status;

(c) the information on aircraft such as aircraft, engine and propeller Type Certificate datasheets, noise and emission certificate data sheets, flight manual and supplements;

(d) the aircraft continuing airworthiness status such as the aircraft and component Airworthiness Directive status, the SB status, the maintenance status, the status of life-limited parts and time-controlled components, weight and centre of gravity schedule including equipment list;

(e) the modification and repair status of the aircraft detailing elements such as owner/operator designed modifications and repairs, Supplemental Type Certificates, etc.;

(f) the aircraft cabin configuration such as emergency equipment fitted, cockpit configuration, placards, instrument limitations, cabin layout;

(g) the maintenance needed for import, such as embodiment of modifications needed to comply with the Type Certificate, bridging check to comply with the new maintenance programme;

(h) the avionics such as, but not limited to, radio and navigation equipment, instrument flight rules (IFR) equipment, digital flight data recorder (DFDR)/cockpit voice recorder (CVR) test, emergency locator transmitter (ELT) 406 MHz code and identification;

(i) the compass compensation;

(j) special operating rules such as extended twin-engine operations (ETOPS)/long range operations (LROPS), reduced vertical separation minima (RVSM), minimum navigation performance specifications (MNPS), low visibility operation (LVO), area navigation (RNAV);

(k) the aircraft survey including verification of conformity with the flight manual and the datasheet, presence of fire proof identification plates, conformity of markings including registration, presence and serviceability of emergency equipment, internal and external lighting systems, and

(l) maintenance check flight including check of control system/cockpit ground check/engine run up.

3. -reserved-

AMC TO APPENDIX TO TCAR AIR PART-M

AMC to Appendix IV — Complex Maintenance Tasks

The sentence ‘suitably approved or authorised welder’ contained in Appendix IV, paragraph 3(c), means that the qualification should meet an officially recognised standard or, otherwise, should be accepted by CAAT.

APPENDICES TO AMC AND GM TO TCAR AIR PART-M

Appendix I to AMC M.A.302 — Content of the maintenance programme

Note: For the purpose of this Appendix, references to CAMO should be understood as references to CAMO or CAO and references to Part 145 organisations should be understood as references to Part-145 or Part-CAO organisations.

1. General requirements

1.1. The maintenance programme 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 owner, operator or CAMO managing the aircraft airworthiness.

1.1.3. The reference, the date of issue and issue number of the approved maintenance programme.

1.1.4. A statement signed by the owner, operator or CAMO managing the aircraft airworthiness to the effect that the specified aircraft will be maintained to the programme and that the programme 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. Check periods, which reflect the anticipated utilisation of the aircraft. Such utilisation should be stated and include a tolerance of not more than that TC holder recommendation. Where utilisation cannot be anticipated, calendar time limits should also be included.

1.1.7. Procedures for the escalation of established check periods, where applicable and acceptable to CAAT.

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

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) For large aeroplanes, maintenance data arising from compliance with the ageing structure requirements.

1.1.14. If applicable, details of Critical Design Configuration Control Limitations together with appropriate procedures.

1.1.15. If applicable a statement of the limit of validity in terms of total flight cycles/calendar date/flight hours 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 CAAT which contain the details of maintenance tasks related to mandatory life and inspection limitations, Certification Maintenance Requirements (CMRs) and Airworthiness Directives.

Note: To prevent inadvertent variations to such tasks or intervals these items should not be included in the main portion of the maintenance programme 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 Type Certificate holder's Maintenance Instructions. 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 programme.

2. General requirements

2.1. An owner or a CAMO aircraft maintenance programme should normally be based upon the MRB report, where applicable, and the Type Certificate holder's maintenance planning document or Chapter 5 of the maintenance manual, (i.e. the manufacturer's recommended maintenance programme).

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

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

2.3. For existing aircraft types it is permissible for the owner or CAMO to make comparisons with maintenance programmes previously approved. It should not be assumed that a programme approved for one owner or the 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 owner or the CAMO when assessing an existing programme.

2.4. Critical Design Configuration Control Limitations (CDCCL)

If CDCCL have been identified for the aircraft type by the Type Certificate / Supplemental Type Certificate holder, maintenance instructions should be developed. CDCCL's 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 maintenance programme should be made by the owner or the CAMO, to reflect changes in the Type Certificate holder's recommendations, modifications, service experience, or as required by CAAT.

4. Permitted variations to maintenance periods

The owner or the CAMO may only vary the periods prescribed by the programme with the approval of CAAT or through a procedure developed in the maintenance programme according to CAAT Guidance Material on AMP and approved by CAAT.

5. Periodic review of maintenance programme contents

5.1. The owner or the CAMO approved maintenance programmes should be subject to periodic review to ensure that they reflect current Type Certificate holder's recommendations, revisions to the MRB report if applicable, mandatory requirements and the maintenance needs of the aircraft.

5.2. The owner 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:

(a) the aircraft maintenance programme is based upon MSG-3 logic;

(b) the aircraft maintenance programme includes condition monitored components;

(c) the aircraft maintenance programme does not contain overhaul time periods for all significant system components;

(d) when specified by the Manufacturer's maintenance planning document or MRB.

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

(a) the maintenance programme is based upon the MSG-1 or 2 logic but only contains hard time or on condition items;

(b) the aircraft is not a complex motor-powered aircraft according to TCAR AIR Part-M;

(c) the aircraft maintenance programme 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/operator 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.

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 level 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 enough statistical data is missing, rather that 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 an engineering judgement, a CAMO is encouraged to establish contact and make comparisons with other CAMOs of the same aircraft, 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 CAMO(s). Paragraph 6.6 of this paragraph specifies under which conditions it is acceptable that CAMOs share reliability data.

6.2.7. Notwithstanding the above there are cases where the CAMO will be unable to pool data with other CAMO, e.g. at the introduction to service of a new type. In that case CAAT may impose additional restrictions on the MRB/MPD tasks intervals (e.g. no variations or only minor evolution are possible, and with CAAT 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, CAAT is expected to ensure that the organisation which runs the programme (it may be CAMO, or a Part-145 organisation under contract) hires sufficiently qualified personnel with appropriate engineering experience and understanding of reliability concept (see AMC M.A.305).

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

6.4. Contracted maintenance

6.4.1. Whereas M.A.302 specifies that, the aircraft maintenance programme, which includes the associated reliability programme, should be managed and presented by the CAMO to CAAT, 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:

1) Developing the aircraft maintenance and reliability programmes,

2) Performing the collection and analysis of the reliability data,

3) Providing reliability reports, and

4) Proposing corrective actions to the CAMO.

6.4.3. Notwithstanding the above decision to implement a corrective action (or the decision to request from CAAT the approval to implement a corrective action) remains the CAMO 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 and the relevant CAME, and maintenance organisation procedures.

6.5. Reliability programme

In preparing the 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 prime objectives of the programme. To the 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 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 maintenance planning documents may give guidance on the objectives and should be consulted in every case.

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

6.5.2. Identification of items.

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

6.5.3. Terms and definitions.

The significant terms and definitions applicable to the Programme should be clearly identified. Terms are already defined in MSG-3, Part-145 and Part-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.

6.5.4.2. The type of information to be collected should be related to the objectives of the 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) Technical Logs.

(c) Aircraft Maintenance Access Terminal / On-board Maintenance System readouts.

(d) Maintenance Worksheets.

(e) Workshop Reports.

(g) Reports on Functional Checks.

(h) Reports on Special Inspections.

(i) Stores Issues/Reports.

(j) Air Safety Reports.

(k) Reports on Technical Delays and Incidents.

(l) Other sources: ETOPS, RVSM, CAT II/III.

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 TCAR AIR Part-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 programme, the display of information should be oriented accordingly.

6.5.6. Examination, analysis and interpretation of the information.

The method employed for examining, analysing and interpreting the 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 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 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 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 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 of aircraft types).

(b) Analysis and interpretation of trends.

(c) The evaluation of repetitive defects.

(d) Confidence testing of expected and achieved results.

(e) Studies of life-bands and survival characteristics.

(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 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 occurring on-line and at main base.

(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, technical instructions, etc.

6.5.6.4. Where the CAMO relies upon contracted maintenance and/or overhaul facilities as an information input to the 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 effects of corrective actions should be fully described. Corrective actions shall correct any reduction in reliability revealed by the programme and could take the form of:

(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 maintenance programme. This may include escalation or de-escalation of tasks, addition, modification or deletion of tasks.

(c) Amendments to approved manuals (e.g. maintenance manual, crew manual).

(d) Initiation of modifications.

(e) Special inspections of fleet campaigns.

(f) Spares provisioning.

(g) Staff training.

(h) Manpower and equipment planning.

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

6.5.7.2. The procedures for effecting changes to the maintenance programme should be described, and 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 programme should be stated. The chains of responsibility for individuals and departments (Engineering, Production, Quality, Operations etc.) in respect of the programme, together with the information and functions of any programme control committees (reliability group), should be defined. Participation of the competent authority should be stated. This information should be contained in the CAME as appropriate.

6.5.9. Presentation of information to CAAT.

The following information should be submitted to CAAT 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 request for increases in periods between maintenance (escalation) and for amendments to the approved maintenance programme. These reports should contain sufficient detailed information to enable CAAT to make its own evaluation where necessary.

6.5.10. Evaluation and review.

Each 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 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.

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/seasonal).

(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 maintenance programme amendment

CAAT may authorise the CAMO to implement in the maintenance programme changes arising from the reliability programme results prior to the formal approval by CAAT when satisfied that;

(a) the Reliability Programme monitors the content of the Maintenance Programme 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 Type Certificate data sheet compliance (variant)/modification status, including SB compliance.

(b) Operational Factors, such as: operational environment/utilisation, e.g. low/high/seasonal, etc./respective fleet size operating rules applicable (e.g. ETOPS/RVSM/All Weather etc.)/operating procedures/MEL and MEL utilisation.

(c) Maintenance factors, such as: aircraft age maintenance procedures; maintenance standards applicable; lubrication procedures and programme; MPD revision or escalation applied or maintenance programme applicable

6.6.2. Although it may not be necessary for all of the foregoing to be completely common, it is necessary for a substantial amount of commonality to prevail.

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 CAAT, so as to allow the owner/CAMO to operate the aircraft under the same programme during the lease agreement effectivity.

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 CAAT should be sought prior to any formal agreement being signed between CAMOs.

6.6.5. Whereas this paragraph 6.6 is intended to address the pooling of data directly between CAMOs, it is acceptable that the CAMO participates in a reliability programme managed by the aircraft manufacturer, when CAAT is satisfied that the manufacturer manages a reliability programme which complies with the intent of this paragraph.