



AERONAUTICAL CIRCULAR CIVIL AVIATION AUTHORITY – MACAO, CHINA

SUBJECT:

<u>Acceptable Means of Compliance and Interpretative/Explanatory Material to the</u> <u>Nineteenth Schedule of Air Navigation Regulations of Macao</u>

EFFECTIVE DATE:

01 May 2023

CANCELLATION:

This Aeronautical Circular (AC) supersedes AC No.AC/AW/022R01 dated 13 October 2021.

GENERAL:

The President of Civil Aviation Authority (AACM), in exercise of his power under article 35 of the Statutes of Civil Aviation Authority approved by the Decree-Law 10/91/M and paragraph 89 of the Air Navigation Regulation of Macao (ANRM), established this Aeronautical Circular.

1. Introduction

- 1.1. Pursuant to paragraph 82A of the ANRM, this AC contains acceptable means of compliance with interpretative/explanatory material to the Nineteenth Schedule of the ANRM, which prescribes the requirements regarding operator's continuing airworthiness responsibility.
- 1.2. Where a particular requirement does not have an acceptable means of compliance or any interpretative/explanatory material, it is considered that no supplementary material is required.

2. Presentation

2.1. A numbering system has been used in which the acceptable means of compliance or interpretative/explanatory material uses the same number as the requirement paragraph in the Nineteenth Schedule of ANRM to which it refers. The number is introduced by the letters AMC or IEM to distinguish the material in the Nineteenth Schedule of ANRM.

- 2.2. The acronyms AMC and IEM also indicate the nature of the material and for this purpose the two types of material are defined as follows:
 - (a) Acceptable means of compliance (AMC) illustrates a means to establish compliance with a requirement.
 - (b) Interpretative/explanatory material (IEM) helps to illustrate the meaning of a requirement.
- 2.3. Explanatory notes not forming part of the AMC or IEM text appear in a smaller typeface.

3. Acceptable means of compliance and interpretative/explanatory material (AMC and IEM)

IEM OPSM.875 General

(See OPSM.875 of the Nineteenth Schedule of ANRM)

- 1. Reference to aircraft includes the components fitted to or intended to be fitted to the aircraft.
- 2. The performance of de-icing and anti-icing activities does not require a MAR-145 approval.

IEM OPSM.885(a) Application for and Approval of the Operator's Maintenance System (See OPSM.885(a) of the Nineteenth Schedule of ANRM)

- 1. The AACM does not expect the documents listed in OPSM.885(a) of the Nineteenth Schedule of ANRM to be submitted in a completed state with the initial application for grant or variation since each will require approval in its own right and may be subject to amendment as a result of AACM assessment during the technical investigations. Draft documents should be submitted at the earliest opportunity so that investigation of the application can begin. Grant or variation cannot be achieved until the AACM is in possession of completed documents.
- 2. This information is required to enable the AACM to conduct its investigation into the application, to assess the volume of maintenance work necessary and the locations at which it will be accomplished.
- 3. The applicant should inform the AACM where base and scheduled line maintenance is to take place and give details of any contracted maintenance which is in addition to that provided in response to OPSM.895(a) or (c) of the Nineteenth Schedule of ANRM.
- 4. At the time of application, the Operator should have arrangements for all base and scheduled line maintenance in place for an appropriate period of time, as acceptable to the AACM. The operator should establish further arrangements in due course before the maintenance is due.
- 5. Base maintenance contracts for high-life time checks may be based on one time contracts, when the AACM considers that this is compatible with the operator's fleet size.



IEM OPSM.885(b) Application for and Approval of the Operator's Maintenance System (See OPSM.885(b) of the Nineteenth Schedule of ANRM)

- 1. The approval of an operator's maintenance system will be indicated by means of a statement containing the following information:
 - a. Air Operator Certificate number;
 - b. Name of the Operator;
 - c. Type(s) of aircraft for which the maintenance system has been accepted;
 - d. Reference identification of the operator's approved aircraft maintenance programme(s) related to (c) above;
 - e. Reference identification of the operators approved maintenance management exposition; and
 - f. Any limitations imposed by the AACM on the grant or variation.

Note: Approval may be limited to specified aircraft types, to specific locations or by other means like operational limitations if considered necessary by the AACM in the interests of safe operation.

AMC OPSM.890(a) Continuing Airworthiness Responsibility

(See OPSM.890(a) of the Nineteenth Schedule of ANRM)

- 1. 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.
- 2. An operator should therefore have adequate knowledge of the design status (type specification, customer options, AD's, modifications, operational equipment) and required and performed maintenance. Status of aircraft design and maintenance should be adequately documented to support the performance of the quality system (See OPSM.900 of the Nineteenth Schedule of ANRM).
- 3. 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.
- 4. The requirement does not mean that an operator himself performs the maintenance (this is to be done by a MAR-145 Approved Maintenance Organisation (See OPSM.895 of the Nineteenth Schedule of ANRM) 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.

5. When an operator is not appropriately approved in accordance with MAR-145, the operator should provide a clear work order to the maintenance contractor. The fact that an operator has contracted a MAR-145 Approved Maintenance Organisation should not prevent him from checking at the maintenance facilities on any aspect of the contracted work if he wishes to do so to satisfy his responsibility for the airworthiness of the aircraft.

AMC OPSM.890(a)(1) Continuing Airworthiness Responsibility

(See OPSM.890(a)(1) of the Nineteenth Schedule of ANRM)

- 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 emergency equipment should be established.
 - b. Inspection of the Technical log 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. That consumable fluids, gases etc. uplifted prior to flight are of the correct specification, free from contamination, and correctly recorded.
 - d. That all doors are securely fastened.
 - e. Control surface and landing gear locks, pitot/static covers, restraint devices and engine/aperture blanks have been removed.
 - f. That all the aircraft's external surfaces and engines are free from ice, snow, sand, dust etc.
- 2. Tasks such as oil and hydraulic fluid uplift and tyre inflation may be considered as part of the pre-flight inspection, if acceptable to the AACM. 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 MAR-145 approved/accepted Maintenance Organisation.
- 3. An operator 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 of OPSM.900 of the Nineteenth Schedule of ANRM. It should be demonstrated to the AACM that pre-flight inspection personnel have received appropriate training for the relevant pre-flight inspections tasks. The training standard for personnel performing the pre-flight inspection should be described in the Operator's Maintenance Management Exposition.

IEM OPSM.890(a)(1) Continuing Airworthiness Responsibility

See OPSM.890(a)(1) of the Nineteenth Schedule of ANRM)

The fact that the performance of pre-flight inspections is an Operator's continuing airworthiness responsibility does not necessarily means that such personnel performing pre-flight inspection tasks report to the Nominated Postholder for Maintenance, but that the Nominated postholder for Maintenance is responsible for determining the content of the pre-flight inspection and setting the qualification standard of the involved personnel. In addition, compliance with the qualification standard should be monitored by the Operator's Quality System.

AMC OPSM.890(a)(2) Continuing Airworthiness Responsibility

(See OPSM.890(a)(2) of the Nineteenth Schedule of ANRM)

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 MEL or CDL as appropriate and that no postponement of such a defect rectification can be permitted unless with the Operator's agreement and in accordance with a procedure approved by the AACM.

AMC OPSM.890(a)(3) Continuing Airworthiness Responsibility

(See OPSM.890(a)(3) of the Nineteenth Schedule of ANRM)

The Operator 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 with the Operator's agreement and in accordance with a procedure approved by the AACM.

AMC OPSM.890(a)(4) Continuing Airworthiness Responsibility (See OPSM.890(a)(4) of the Nineteenth Schedule of ANRM)

An operator 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 (this amendment will involve the approval of the AACM unless the operator has been approved to amend the maintenance programme without direct involvement of the AACM).

IEM OPSM.890(a)(5) Continuing Airworthiness Responsibility (See OPSM.890(a)(5) of the Nineteenth Schedule of ANRM)

"Any other continued airworthiness requirement made mandatory by the AACM" includes Type Certification related requirements such as: Certification Maintenance Requirements (CMR's), Life Limited Parts, Airworthiness Limitations, etc...

AMC OPSM.890(a)(6) Continuing Airworthiness Responsibility

(See OPSM.890(a)(6) of the Nineteenth Schedule of ANRM)

An operator should establish a policy, and work to that policy, to assess non-mandatory information related to the airworthiness of the aircraft, such as Service Bulletins, Service Letters and other information on the aircraft and its components from the design organisation, the manufacturer or the related airworthiness authorities.

AMC OPSM.895(a) Maintenance Management

(See OPSM.895(a) of the Nineteenth Schedule of ANRM)

- 1. The requirement is intended to provide for the possibility of the following three alternative options:
 - a. An operator to be approved in accordance with MAR-145 to carry out all maintenance of the aircraft and aircraft components;
 - b. An operator to be approved in accordance with MAR-145 to carry out some of the maintenance of the aircraft and aircraft components. This, at minimum, could be limited line maintenance but may be considerably more but still short of option (a);
 - c. An operator not approved in accordance with MAR-145 to carry out any maintenance.
- 2. An operator or prospective operator may apply for any one of these options but it will be for the AACM to determine which option may be accepted in each particular case.
 - 2.1. To make this determination the AACM will apply the primary criteria of relevant operator experience if carrying out some or all maintenance on comparable aircraft. Therefore where an operator applies for option (a) all maintenance the AACM will need to be satisfied that the operator has sufficient experience of carrying out all maintenance on a comparable type. For example, assuming that the experience is judged satisfactory, then it is reasonable from the maintenance viewpoint to add a different wide bodied aircraft to an existing wide bodied fleet. If the experience is not satisfactory or too limited the AACM may choose either to require more experienced management and/or more experienced release to service staff or may refuse to accept the new wide bodied aircraft if extra experienced staff cannot be found. Option (b) or (c) may be possible alternatives.

- 2.2. Where an operator applies for option (b) some maintenance, or the AACM has been unable to accept an application for option (a) then satisfactory experience is again the key but in this case the satisfactory experience is related to the reduced maintenance of this option. If the experience is not satisfactory or too limited the AACM may choose to require more experienced staff or may refuse to accept the application if such staff cannot be found. Option (c) may be the possible alternative. Option (c) accepts that the operator either does not have satisfactory experience or has only limited experience of some maintenance.
- 2.3. The AACM will require an operator to enter into a contract with an appropriately approved MAR-145 organisation except that in some cases where the AACM believes that it is possible to obtain sufficient satisfactorily experienced staff to provide the minimal maintenance support for option (b), in which case option (b) would apply.
- 2.4. In respect of this paragraph, 'experience' means staff who have proven evidence that they were directly involved with at least line maintenance of similar aircraft types for not less than 12 months. Such experience should be demonstrated to be satisfactory. An operator is required to have enough personnel meeting the requirement of OPSM.895(b) of the Nineteenth Schedule of ANRM to manage the maintenance responsibility whichever option is used.

AMC OPSM.895(b) Maintenance Management

(See OPSM.895(b) of the Nineteenth Schedule of ANRM)

- 1. The person or group of persons employed should represent the maintenance management structure of the operator (for maintenance) and be responsible for all maintenance functions. Dependent on the size of the operation and the organisational set-up, the maintenance functions may be divided under individual managers or combined in nearly any number of ways. This includes combining the functions of 'accountable manager', the 'nominated postholder' and the quality monitoring function so long as the quality monitoring function remains independent of the functions to be monitored. In the smallest organisation this may lead to the quality monitoring function being performed by the accountable manager if suitably qualified. Consequently the smallest organisation consists of at least two persons except that the AACM may agree to the quality monitoring function being subcontracted to another operator's quality monitoring department or a suitably qualified independent person acceptable to the AACM.
- 2. The actual number of persons to be employed and their necessary qualifications is dependent upon the tasks to be performed and thus dependent on the size and complexity of the operation (route network, line or charter, ETOPS, number of aircraft and the aircraft types, complexity of the aircraft and their age), number and locations of maintenance facilities and the amount and complexity of maintenance contracting. Consequently, the number of persons needed, and their qualifications, may differ greatly from one operator to another and a simple formula covering the whole range of possibilities is not feasible.



- 3. To enable the AACM to accept the number of persons and their qualifications, an operator should make an analysis of the tasks to be performed, the way in which he intends to divide and/or combine these tasks, indicate how he intends to assign responsibilities and establish the number of man/hours and the qualifications needed to perform the tasks. With significant changes in the aspects relevant to the number and qualifications of persons needed, this analysis should be updated.
- 4. The AACM does not necessarily expect that the credential of each person of the Maintenance Management Group of Persons are individually submitted to the AACM for their acceptance. However, the Manager of the Maintenance Management Group of Persons, and any manager reporting directly to him should be individually acceptable to the AACM.

AMC OPSM.895(c) Maintenance Management

(See OPSM.895(c) of the Nineteenth Schedule of ANRM)

The AACM should only accept that the proposed person be employed by the MAR-145 Organisation when it is manifest that he/she is the only available competent person in a position to exercise this function, within a practical working distance from the Operator's offices.

IEM OPSM.895(c) Maintenance Management

(See OPSM.895(c) of the Nineteenth Schedule of ANRM)

This paragraph only applies to contracted maintenance and therefore does not affect situations where the MAR- 145 approved/accepted Organisation and the Operator are the same organisation.

AMC OPSM.895(d) Maintenance Management

(See OPSM.895(d) of the Nineteenth Schedule of ANRM)

- 1. Where an operator is not approved to MAR-145 or an operator's maintenance organisation is an independent organisation, a contract should be agreed between the operator and the MAR-145 Approved Maintenance Organisation that specifies, in detail, the work to be performed by the MAR-145 Approved Maintenance Organisation.
- 2. Both the specification of work and the assignment of responsibilities should be clear, unambiguous and sufficiently detailed to ensure that no misunderstanding should arise between the parties concerned (operator, maintenance organisation and the AACM) that could result in a situation where work that has a bearing on the airworthiness or serviceability of aircraft is not or will not be properly performed.



- 3. Special attention should be paid to procedures and responsibilities to ensure that all maintenance work is performed, service bulletins are analysed and decisions taken on accomplishment, airworthiness directives are completed on time and that all work, including non-mandatory modifications is carried out to approved data and to the latest standards.
- 4. For the actual lay out of the contract the IATA Standard Ground Handling Agreement may be used as a basis, but this does not preclude the AACM from ensuring that the content of the contract is acceptable to them, and especially that the contract allows the Operator to properly exercise its maintenance responsibility. Those parts of a contract that have no bearing on the technical or operational aspects of airworthiness are outside the scope of this paragraph.

AMC OPSM.895(e) Maintenance Management

(See OPSM.895(e) of the Nineteenth Schedule of ANRM)

- 1. In the case of a contract with an organisation that is not MAR-145 approved/accepted, the Operator's Maintenance Management Exposition should include appropriate procedures to ensure that all this contracted maintenance is ultimately performed on time by MAR-145 approved/accepted organizations in accordance with data acceptable to the AACM. In particular, the Quality System procedures should place great emphasis on monitoring compliance with the above. The list of MAR-145 approved/accepted contractors, or a reference to this list, should be included in the Operator's Maintenance Management Exposition.
- 2. Such a maintenance arrangement does not absolve the Operator from its overall Maintenance responsibility. Specifically, in order to accept the maintenance arrangement, the AACM should be satisfied that such an arrangement allows the Operator to ensure full compliance with OPSM.890 (Maintenance Responsibility) of the Nineteenth Schedule of ANRM.

IEM OPSM.895(e) Maintenance Management

(See OPSM.895(e) of the Nineteenth Schedule of ANRM)

The purpose of OPSM.895(e) of the Nineteenth Schedule of ANRM is to authorise a primary maintenance arrangement with an organisation which is not a MAR-145 approved/accepted Maintenance Organisation, when it proves that such an arrangement is in the interest of the Operator by simplifying the management of its maintenance, and the Operator keeps an appropriate control of it. Such an arrangement should not preclude the Operator from ensuring that all maintenance is performed by a MAR-145 approved/accepted organisation and complying with the maintenance responsibility requirements specified in OPSM.890 of the Nineteenth Schedule of ANRM. Typical examples of such arrangements follow:

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- Component maintenance:

The Operator may find it more appropriate to have a primary contractor, that would despatch the components to appropriately approved organisations, rather than himself sending different types of components to various MAR-145 approved/accepted maintenance organisations. The benefit for the operator is that the management of maintenance is simplified by having a single contact point for component maintenance. The Operator remains responsible for ensuring that all maintenance is performed by MAR-145 approved/accepted Organisations and in accordance with the approved standard.

- Aircraft, engine and component maintenance:

The operator may wish to have a maintenance contract with another non MAR-145 approved operator of the same type of aircraft. A typical case is that of a dry-leased aircraft between operators, where the parties, for consistency or continuity reasons (especially for short term lease agreements), find it appropriate to keep the aircraft under the current maintenance arrangement. Where this arrangement involves various MAR-145 approved/accepted contractors, it might be more manageable for the lessee Operator to have a single contract with the lessor Operator. Such an arrangement should not be understood as a transfer of responsibility to the lessor Operator: the lessee Operator approved under Nineteenth Schedule of ANRM, remains responsible for the maintenance of the aircraft in performing the functions specified in OPSM.890 of the Nineteenth Schedule of ANRM, and employing the Maintenance Management Group of Persons specified in OPSM.895 of the Nineteenth Schedule of ANRM.

In essence, OPSM.895(e) of the Nineteenth Schedule of ANRM does not alter the intent of OPSM.895(a), (b) and (d) of the Nineteenth Schedule of ANRM in that it also requires that the Operator has to establish a written maintenance contract acceptable to the AACM and, whatever type of acceptable arrangement is made, the Operator is required to exercise the same level of control on contracted maintenance, particularly through the Maintenance Management Group of Persons specified in OPSM.895(b) and Quality System specified in OPSM.900 of the Nineteenth Schedule of ANRM.

IEM OPSM.895(f) and (g) Maintenance Management

(See OPSM.895(f) and (g) of the Nineteenth Schedule of ANRM)

The intent of this paragraph is that maintenance contracts are not necessary when the Operator's maintenance system, as approved by the AACM, specifies that the relevant maintenance activity may be ordered through one time work orders. This includes for obvious reasons occasional line maintenance and may also include aircraft component maintenance up to engines, so long as the AACM considers that the maintenance is manageable through work orders, both in term of volume and complexity. It should be noted that this paragraph implies that even where base maintenance is ordered on a case by case basis, there must be a written maintenance contract.

AMC OPSM.895(h) Maintenance Management (See OPSM.895(h) of the Nineteenth Schedule of ANRM)

Office accommodation in this case means office accommodation such that the incumbents, whether they are maintenance management, planning, technical records or quality staff, can carry out their designated tasks in a manner that contributes to good maintenance standards. In the smaller operators, the AACM may agree to these tasks being conducted from one office subject to being satisfied that there is sufficient space and that each task can be carried out without undue disturbance. Office accommodation should also include an adequate technical library and room for document consultation.

AMC OPSM.900 Quality System

(See OPSM.900) of the Nineteenth Schedule of ANRM)

- 1. An operator should establish a plan acceptable to the AACM to show when and how often the activities as required by OPSM.890 of the Nineteenth Schedule of ANRM will be monitored. In addition, reports should be produced at the completion of each monitoring investigation and include details of discrepancies of non-compliance with procedures or requirements.
- 2. The feedback part of the system should address who is required to rectify discrepancies and noncompliance in each particular case and the procedure to be followed if rectification is not completed within appropriate timescales. The procedure should lead to the Accountable Manager.
- 3. To ensure effective compliance with OPSM.900 of the Nineteenth Schedule of ANRM the following elements have been shown to work well:
 - a. Product sampling the part inspection of a representative sample of the aircraft fleet;
 - b. Defect sampling the monitoring of defect rectification performance;
 - c. Concession sampling the monitoring of any concession to not carry out maintenance on time;
 - d. On time maintenance sampling the monitoring of when (flying hour/calendar time/flight cycle etc.) aircraft and their components are brought in for maintenance;
 - e. Sampling reports of unairworthy conditions and maintenance errors.

Note: OPSM.900 of the Nineteenth Schedule of ANRM includes other self-explanatory monitoring elements.

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IEM OPSM.900 Quality System

(See OPSM.900 of the Nineteenth Schedule of ANRM)

The primary purpose of the quality system is to monitor compliance with the approved procedures specified in an operator's Maintenance Management Exposition to ensure compliance with Nineteenth Schedule of ANRM and thereby ensure the maintenance aspects of the operational safety of the aircraft. In particular, this part of the Quality System provides a monitor of the effectiveness of maintenance, reference OPSM.890 of the Nineteenth Schedule of ANRM, and should include a feedback system to ensure that corrective actions are both identified and carried out in a timely manner.

AMC OPSM.905(a) Maintenance Management Exposition

(See OPSM.905(a) of the Nineteenth Schedule of ANRM)

- 1. The purpose of the Maintenance Management Exposition is to set forth the procedures, means and methods of the operator. Compliance with its contents will assure compliance with Nineteenth Schedule of ANRM, which in conjunction with an appropriate MAR-145 Approved Maintenance Organisation Exposition, is a prerequisite for obtaining an acceptance of the operator's maintenance system by the AACM.
- 2. Where an operator is appropriately approved as a MAR-145 Approved Maintenance Organisation, the exposition of the maintenance organisation may form the basis of the Operator's Maintenance Management Exposition in a combined document as follows:

MAR-145 Exposition

- Part 1 Management
- Part 2 Maintenance Procedures
- Part L2 Additional Line Maintenance Procedures
- Part 3 Quality System Procedures
- Part 4 Contracted JAA/EASA Operators
- Part 5 Appendices (sample of documents)

Part 3 must also cover the functions specified by OPSM.900 of the Nineteenth Schedule of ANRM, Quality System.

Additional parts should be introduced covering the following:

- Part 0 General Organisation
- Part 6 Operator's Maintenance Procedures
- 3. Where an operator is not approved in accordance with MAR-145 but has a maintenance contract with a MAR-145 Approved Maintenance Organisation, the Maintenance Management Exposition should comprise:
 - Part 0 General Organisation
 - Part 1 Operator's Maintenance Procedures
 - Part 2 Quality System
 - Part 3 Contracted Maintenance
- 4. Personnel are expected to be familiar with those parts of the Exposition that are relevant to the maintenance and airworthiness co-ordination work they carry out.
- 5. The operator will need to specify in the Exposition who should amend the document, particularly where there are several parts.
- 6. The person responsible for the management of the Quality System should be responsible for monitoring and amending the Exposition unless otherwise agreed by the AACM, including associated procedures manuals, and the submission of proposed amendments to the AACM for approval. The AACM may agree a procedure, which will be stated in the amendment control section of the Exposition, defining the class of amendments which can be incorporated without the prior consent of the AACM.
- 7. The operator may use Electronic Data Processing (EDP) for publication of the maintenance management exposition. The maintenance management exposition should be made available to the AACM in a form acceptable to the AACM. Attention should be paid to the compatibility of EDP publication systems with the necessary dissemination of the maintenance management exposition, both internally and externally.
- 8. Part 0 "General Organisation" of the Maintenance Management Exposition should include a corporate commitment by the operator, signed by the Accountable Manager confirming that the Maintenance Management Exposition and any associated manuals define the organisation compliance with Nineteenth Schedule of ANRM and will be complied with at all times.

9. The accountable manager's exposition statement should embrace the intent of the following paragraph and in fact this statement may be used without amendment. Any modification to the statement should not alter the intent:

"This exposition defines the organisation and procedures upon which the AACM Operator's Maintenance System Approval is based.

These procedures are approved by the undersigned and must be complied with, as applicable, in order to ensure that all maintenance of(quote Operator's name)...... fleet of aircraft is carried out on time to an approved standard.

It is accepted that these procedures do not override the necessity of complying with any new or amended regulation published by the AACM from time to time where these new or amended regulations are in conflict with these procedures .

It is understood that the AACM will approve this organisation whilst the AACM is satisfied that the procedures are being followed and the work standard maintained. It is understood that the AACM reserves the right to suspend, vary or revoke the maintenance system approval of the organisation, as applicable, if the AACM has evidence that the procedures are not followed and the standards not upheld.

It is further understood that suspension or revocation of the approval of the maintenance system would invalidate the AOC.

Signed

Dated

Accountable Manager and(quote position)......

For and on behalf of(quote organisation's name)...... "

10. Whenever the accountable manager is changed it is important to ensure that the new accountable manager signs the paragraph 9. statement at the earliest opportunity as part of the acceptance by the AACM.

Failure to carry out this action invalidates the Operator's Maintenance System approval.

Paragraph 4 of this AC contains examples of Exposition lay-outs.

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AMC OPSM.915 Operator's aircraft technical log (See OPSM.915 of the Nineteenth Schedule of ANRM)

- 1. The operator's aircraft technical log is a system for recording defects and malfunctions discovered during the operation and for recording details of all maintenance carried out on the particular aircraft to which the operator's aircraft technical log applies whilst that aircraft is operating between scheduled visits to the base maintenance facility. In addition, it is used for recording operating information relevant to flight safety and should contain maintenance data that the operating crew need to know. Where a means of recording defects or malfunctions in the cabin or galleys that affect the safe operation of the aircraft or the safety of its occupants, separate from the aircraft technical log, is used, this should be regarded as forming part of the aircraft technical log system.
- 2. The operator's 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, for the complete aircraft, issued normally at the end of the last maintenance check.

Note: The flight crew does not need to receive such details if the next scheduled maintenance is controlled by other means acceptable to the AACM.

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

- i. The aircraft type and registration mark.
- ii. The date and place of take-off and landing.
- iii. The times at which the aircraft took off and landed.
- iv. The running total of flying hours, such that the hours to the next schedule maintenance can be determined. The flight crew does not need to receive such details if the next scheduled maintenance is controlled by other means acceptable to the AACM.
- 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

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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 Certificate of Release to Service or, if agreed by the AACM, the alternate abbreviated Certificate of Release to Service 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.

The alternate abbreviated certificate of release to service consists of the following statement "MAR 145.50 release to service" in place of the full certification statement specified in AMC 145.50(b) paragraph 1.

When the AACM agrees to the use of the alternate abbreviated certificate of release to service, the introductory section of the technical log should include an example of the full certification statement from AMC 145.50(b) paragraph 1 together with a note stating; "The alternate abbreviated certificate of release to service used in this technical log satisfies the intent of MAR 145.50(a) only. All other aspects of MAR 145.50(b) shall be complied with".

- 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.
- 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. Maximum or Inter Contingency Power are two examples.
- 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 multisector 'part removable' type then such 'part removable' sections should contain all of the foregoing information where appropriate.

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

Note 3: Section 3 lay-out 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 Certificate of Release to Service 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 engineering if problems arise whilst operating the routes etc.

The Aircraft Technical Log System can be either a paper or computer system or any combination of both methods.

AMC OPSM.920 Continuing airworthiness Records

(See OPSM.920 of the Nineteenth Schedule of ANRM)

- 1. The operator should ensure that he always receives a complete MAR-145 Certificate of Release to Service such that the required records can be retained. The system to keep the continuing airworthiness records should be described in the operator's maintenance management exposition or in the relevant MAR-145 exposition.
- 2. When an operator arranges for the relevant maintenance organisation to retain copies of the continuing airworthiness records on his behalf, he will nevertheless continue to be responsible for the records under OPSM.920(b) of the Nineteenth Schedule of ANRM relating to the preservation of records. If he ceases to be the operator of the aircraft, he also remains responsible for transferring the records to any other person who becomes the operator of the aircraft.

- 3. Keeping continuing airworthiness records in a form acceptable to the Civil Aviation Authority normally means in paper form or on a computer database or a combination of both methods. Records stored in microfilm or optical disc form are also acceptable.
- 4. Paper systems should use robust material which can withstand normal handling and filing. The record should remain legible throughout the required retention period.
- 5. Computer systems should have at least one backup system which should be updated at least within 24 hours of any maintenance. Each terminal is required to contain programme safeguards against the ability of unauthorised personnel to alter the database.
- 6. Microfilming or optical storage of continuing airworthiness records may be carried out at any time. The records should be as legible as the original record and remain so for the required retention period.
- 7. Information on times, dates, cycles etc. as required by OPSM.920 of the Nineteenth Schedule of ANRM hereafter referred to as 'summary continuing airworthiness records' are those records that give an overall picture on the state of continuing airworthiness of the aircraft and any life-limited aircraft component. The current status of all life-limited aircraft components should indicate the component life limitation, total number of hours, accumulated cycles or calendar time and the number of hours/cycles/time remaining before the required retirement time of the component is reached.
- 8. The current status of Airworthiness Directives (AD) should identify the applicable AD's including revision or amendment numbers. Where an AD is generally applicable to the aircraft or component type but is not applicable to the particular aircraft or component, then this should be identified. The AD status includes the date when the AD was accomplished, and where the AD is controlled by flight hours or flight cycles it should include the aircraft or engine or component total flight hours or cycles, as appropriate. For repetitive AD's, only the last application should be recorded in the AD status. The status should also specify which part of a multi-part directive has been accomplished and the method, where a choice is available in the AD.
- 9. Details of current modification and repairs means the substantiating data supporting compliance with the airworthiness requirements. This can be in the form of a Supplemental Type Certificate, Service Bulletin, Structural Repair Manual or similar approved document. If the airworthiness data for modification and repair is produced by the MAR-145 organisation in accordance with existing national regulations all detailed documentation necessary to define the change and its approval should be retained.
- 10. The substantiating data may include:
 - a. Compliance programme;

- b. Master drawing or drawing list, production drawings, installation instructions;
- c. Engineering reports (static strength, fatigue, damage tolerance, fault analysis, etc.);
- d. Ground and flight test programme and results;
- e. Mass and balance change data;
- f. Maintenance and repair manual supplements;
- g. Maintenance programme changes and instructions for continuing airworthiness; and
- h. Aircraft flight manual supplement.
- 11. Maintenance records should be stored in a safe way with regard to fire, flood, theft and alteration.
- 12. 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.

IEM OPSM.920(b)(6) Continuing Airworthiness Records

(See OPSM.920(b)(6) of the Nineteenth Schedule of ANRM)

For the purpose of this paragraph, a "component vital to flight safety" means a component that includes Life Limited Parts or is subject to Airworthiness Limitations or a major component such as, undercarriage and flight controls.

AMC OPSM.920(c) Continuing Airworthiness Records

(See OPSM.920(c) of the Nineteenth Schedule of ANRM)

- 1. Where an operator terminates his operation, all retained continuing airworthiness records should be passed on to the new operator or, if there is no operator, stored as required by the AACM.
- 2. 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 the AACM 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.



IEM OPSM.930 Continued Validity of the Air Operator Certificate in Respect of the Maintenance System

(See OPSM.930 of the Nineteenth Schedule of ANRM)

This paragraph covers scheduled changes to the maintenance system. This paragraph is included to ensure that operators remain aware that there is a requirement which may affect continued acceptance of the maintenance arrangement.

IEM OPSM.935 Equivalent Safety Case

(See OPSM.935 of the Nineteenth Schedule of ANRM)

Refer to paragraph 82A of the ANRM.

4. Maintenance Management Exposition

(See AMC OPSM.905(a))

4.1. Maintenance Management Exposition for an Operator who is also approved in accordance with MAR-145.

The Exposition may be put together in any subject order and subjects combined so long as all applicable subjects are covered.

PART 0 GENERAL ORGANISATION

- 0.1 Corporate commitment by the Operator;
- 0.2 General information:
 - Brief description of organisation
 - Relationship with other organisations
 - Fleet composition Type of operation
 - Line station locations;
- 0.3 Maintenance Management personnel:
 - Accountable Manager
 - Nominated postholder
 - Maintenance co-ordination

- Duties and responsibilities
- Organisation chart(s)
- Manpower resources and training policy
- 0.4 Notification procedure to the AACM regarding changes to the Operator's maintenance arrangements/locations/ personnel/activities/approval
- 0.5 Exposition amendment procedures.
- *PART 1 MANAGEMENT
- *PART 2 MAINTENANCE PROCEDURES

*PART L2 ADDITIONAL LINE MAINTENANCE PROCEDURES

*PART 3 QUALITY SYSTEM PROCEDURES

Qualifying operator's maintenance personnel not covered by MAR-145.

Note: The Quality System procedures shown in paragraph 4.2 of this AC. (Maintenance Management Exposition for an Operator who is NOT approved in accordance with MAR-145) must also be taken into account.

- *PART 4 CONTRACTED MACAO OPERATORS
- *PART 5 APPENDICES (Sample of Documents)

(*) These Parts comprise the Exposition of the MAR-145 approved maintenance organisation.

- PART 6 OPERATOR'S MAINTENANCE PROCEDURES
 - 6.1 Aircraft technical log utilisation and MEL application;
 - 6.2 Aircraft maintenance programme Development and amendment;
 - 6.3 Time and maintenance records, Responsibilities, Retention, Access;
 - 6.4 Accomplishment and control of Airworthiness Directives;
 - 6.5 Analysis of the effectiveness of the maintenance programme;
 - 6.6 Non-mandatory modification embodiment policy;

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- 6.7 Major modification standards;
- 6.8 Defect reports:
 - Analysis
 - Liaison with manufacturers and Regulatory Authorities
 - Deferred defect policy;
- 6.9 Engineering activity;
- 6.10 Reliability programmes
 - Airframe
 - Propulsion
 - Components;
- 6.11 Pre-flight Inspection:
 - Preparation of aircraft for flight
 - Sub-contracted Ground Handling functions
 - Security of Cargo and Baggage loading
 - Control of refuelling, Quantity/Quality
 - Control of snow, ice, dust and sand contamination to an approved standard;
- 6.12 Aircraft weighing;
- 6.13 Flight test procedures; **
- 6.14 Sample of documents, Tags and Forms used;
- (**) could be covered in Part 2, Maintenance Procedures.
- 4.2. Maintenance Management Exposition for an Operator who is NOT approved in accordance with MAR-145

The Exposition may be put together in any subject order so long as all applicable subjects are covered.

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PART 0 GENERAL ORGANISATION

(as shown in paragraph 4.1 above)

PART 1 OPERATOR'S MAINTENANCE PROCEDURES

(as shown in paragraph 4.1, Part 6 entitled – Operator's Maintenance procedures)

PART 2 QUALITY SYSTEM

- 2.1 Maintenance quality policy, plan and audit procedures;
- 2.2 Monitoring of maintenance management activities;
- 2.3 Monitoring the effectiveness of the maintenance programme;
- 2.4 Monitoring that all maintenance is carried out by an appropriate MAR-145 organisation:
 - - Aircraft maintenance
 - – Engines
 - - Components;
- 2.5 Monitoring that all contracted maintenance is carried out in accordance with the contract, including sub-contractors used by the maintenance contractor;
- 2.6 Quality audit personnel.

PART 3 CONTRACTED MAINTENANCE

- 3.1 Maintenance contractor selection procedure;
- 3.2 Detailed list of maintenance contractors;
- 3.3 Relevant technical procedures identified in the maintenance contract(s).

-END -