澳門特別行政區
REGIÃO ADMINISTRATIVA ESPECIAL DE MACAU

民航局
AUTORIDADE DE AVIAÇÃO CIVIL
CIVIL AVIATION AUTHORITY

AERONAUTICAL CIRCULAR
CIVIL AVIATION AUTHORITY – MACAO, CHINA

SUBJECT: *__Air Operator Quality System Requirements__*

EFFECTIVE DATE:

01 March 2011

CANCELLATION:

NIL

GENERAL:

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

1. Introduction

According to paragraph 75(2) & 75(3) of the ANRM, one of the requirements for the grant and the continued validity of an Air Operator Certificate (AOC) is establishing and maintaining a quality system.

Establishment of a quality system has long been a requirement in the ANRM for monitoring and ensuring aircraft airworthiness in the aircraft maintenance aspects. This AC extends the quality system requirements to cover all aspects relating to the safe operations of an AOC holder.

2. Applicability

2.1 This AC applies to all Macao Air Operator Certificate holders and any person applying for the grant of an AOC.

2.2 From 01 September 2011, current Macao AOC holders shall have a functional quality system. (Refer to Appendix C of this AC for the quality system acceptance procedure.)

2.3 New AOC applicant must comply with the requirements in this AC prior to the grant of an AOC.
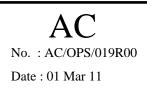
3. **Implementation Standard**

3.1 "Appendix A – Acceptable Means of Compliance" to this AC illustrates a means, or several alternative means, but not necessarily the only possible means by which the Air Operator Quality System Requirements can be met.

3.2 An AOC holder shall establish the quality system in accordance with the Appendix A – Acceptable Means of Compliance.

3.3 AACM may accept an alternative means of compliance to meet the requirements specified in this AC. If an AOC holder has the need to introduce an alternative means of compliance, he/she shall provide to AACM the justifications and demonstrate that the proposed alternative means can comply with the relevant requirements.

4. **Air Operator Quality System Requirements**

4.1 Each AOC holder shall establish a quality system and designate a quality manager to monitor compliance with, and adequacy of, procedures required to ensure safe operational practices and airworthy aircraft. Compliance monitoring shall include a feedback system to the accountable manager to ensure corrective action as necessary.

4.2 Each AOC holder shall ensure that the quality system includes a quality assurance program that contains procedures designed to verify that all operations are being conducted in accordance with all applicable requirements, standards and procedures.

4.3 The quality system, and the quality manager, shall be acceptable to the AACM.

4.4 Each AOC holder shall describe the quality system in relevant documentation.

4.5 Notwithstanding paragraph 4.1 above, the AACM may accept the nomination of two Quality Managers, one for operations and one for engineering and maintenance, provided that the operator has designated one Quality Management Unit to ensure that the Quality System is applied uniformly throughout the entire operation.

4.6 Where the AOC holder is also an Approved Maintenance Organization, the AOC holder's quality system may be combined with the requirements of an AMO and submitted for acceptance to the AACM.

5. **Relevant Documentation**

5.1 The relevant documentation referred in paragraph 4.4 above shall be acceptable to the AACM.

5.2 The relevant documentation describing an operator's quality system shall include at least the following:

   a) Quality policy
   b) Terminology
   c) Specified operational standards;
   d) A description of the organization of the quality system;

Page 2 of 15

Alameda Dr. Carlos D'Assumpção, 336-342, Centro Comercial Cheng Feng, 18° andar - Macau
Tel.: (853) 28511213 • Fax: (853) 28338089 • AFTN: VMMCYAYX • E-mail: aacm@aacm.gov.mo

e) The allocation of duties and responsibilities;
f) Qualification requirements for quality manager and auditors;
g) Operational procedures to ensure regulatory compliance;
h) The quality assurance program, including as a minimum:
    (i) Audit scope
    (ii) Audit scheduling
    (iii) Audit procedures
    (iv) Reporting procedures
    (v) Follow-up and corrective action procedures
        a. Findings analysis and classification
        b. Corrective action plan
        c. Follow-up time limit definition
    (vi) Management evaluation
    (vii) Record system
        a. Quality system records management including sample forms
        b. Records storage period
i) Quality system training

5.3 Quality system records shall be retained for a minimum of 5 years.

- END –

Appendix A – Acceptable Means of Compliance

1. Introduction

1.1 In order to show compliance with the Air Operator Quality System requirements laid down in this AC, an operator should establish his Quality System in accordance with the instructions and information contained in the succeeding paragraphs.

2. General

2.1 Terminology

The terms used in the context of the requirement for an operator's Quality System have the following meanings:

Accountable Manager. The person acceptable to the AACM who has corporate authority for ensuring that all operations and maintenance activities can be financed and carried out to the standard required by the AACM, and any additional requirements defined by the operator.

Quality Assurance. All those planned and systematic actions necessary to provide adequate confidence that operational and maintenance practices satisfy given requirements.

Quality Manager. The manager, acceptable to the AACM, responsible for the management of the Quality System, monitoring function and requesting remedial actions.

2.2 Quality Policy

2.2.1 An operator shall establish a formal, written quality policy statement that is a commitment by the Accountable Manager as to what the quality system is intended to achieve. The quality policy should reflect the achievement and continued compliance with the Macao aviation safety regulations together with any additional standards specified by the operator. The quality policy should also include a statement committing the organization to recognize the need for all personnel to cooperate with the quality auditors.

2.2.2 The Accountable Manager will have overall responsibility for the AOC holders Quality System including the frequency, format and structure of the internal management evaluation activities as prescribed in paragraph 4.9 below.

2.3 Purpose of the Quality System

2.3.1 The Quality System should enable the operator to monitor compliance with Macao aviation regulations, the Operations Manual, the Operator's Maintenance Management

Exposition, and any other standards specified by that operator, or the AACM, to ensure safe operations and airworthy aircraft.

2.4 Quality Manager

2.4.1   The function of the Quality Manager to monitor compliance with, and the adequacy of, procedures required to ensure safe operational practices and airworthy aircraft as required by the Macao aviation regulations may be carried out by more than one person by means of different, but complementary, Quality Assurance Programs.

2.4.2   The primary role of the Quality Manager is to verify, by monitoring activity in the fields of flight operations, engineering and maintenance, crew training and ground operations, that the standards required by the AACM, and any additional requirements defined by the operator, are being carried out under the supervision of the relevant required management personnel.

2.4.3   The Quality Manager should have knowledge and experience appropriate for his scope of work.

2.4.4   The Quality Manager should be responsible for ensuring that the quality assurance program is properly established, implemented and maintained.

2.4.5   The Quality Manager should:
   a) Report to the Accountable Manager;
   b) Not be one of the required management personnel; and
   c) Have access to all parts of the operator's, and as necessary, any sub-contractor's organization.

2.4.6   In the case of small/very small operators, the posts of the Accountable Manager and quality manager may be combined. However, in this event, quality audits should be conducted by independent personnel. In accordance with paragraph 2.4.5 b) above, it will not be possible for the Accountable Manager to be one of the nominated post holders.

3.   Quality System

3.1 Introduction

3.1.1   The operator's Quality System should ensure compliance with and adequacy of operational and maintenance activities requirements, standards and operational procedures.

3.1.2   The operator should specify the basic structure of the Quality System applicable to the operation.

3.1.3   The Quality System should be structured according to the size and complexity of the operation to be monitored ('small operators' see also paragraph 7 below).

Note: See also OPSM.900 of the 19th Schedule to the ANRM and Aeronautical Circular AC/AW/022 for quality system requirements for maintenance aspects.

3.2   Scope

3.2.1   As a minimum, the quality system should address the following:
   a)   The provisions of the ANRM and relevant safety regulations;
   b)   The operator's additional standards and operating practices;
   c)   The operator's quality policy;
   d)   The operator's organizational structure;
   e)   Responsibility for the development, establishment and management of the quality system;
   f)   Documentation, including manuals, reports and records;
   g)   Quality procedures;
   h)   Quality assurance program;
   i)   The required financial, material and human resources;
   j)   Training requirements.

3.2.2   The quality system should include a feedback system to the Accountable Manager to ensure that corrective actions are both identified and promptly addressed. The feedback system should also specify who is required to rectify discrepancies and non-compliance in each particular case, and the procedure to be followed if corrective action is not completed within an appropriate timescale.

3.3   Relevant Documentation

3.3.1   Relevant documentation includes the relevant part of the Operations Manual and the Operator's Maintenance Management Exposition, which may be included in a separate Quality Manual.

4.   Quality Assurance Program

4.1   Introduction

4.1.1   The Quality Assurance Program should include all planned and systematic actions necessary to provide confidence that all operations and maintenance are conducted in accordance with all applicable requirements, standards and operational procedures.

4.1.2   When establishing a Quality Assurance Program, consideration should, at least, be given to the paragraphs 4.2 to 4.9 below:

4.2 Quality Inspection

4.2.1 The primary purpose of a quality inspection is to observe a particular event/action/document etc., in order to verify whether established operational procedures and requirements are followed during the accomplishment of that event and whether the required standard is achieved.

4.2.2 Typical subject areas for quality inspections are:
    a) Actual flight operations;
    b) Ground De-icing/Anti-icing;
    c) Flight Support Services;
    d) Load Control;
    e) Engineering & Maintenance;
    f) Technical Standards; and
    g) Training Standards.

Note: See also OPSM.900 of the 19th Schedule to the ANRM and Aeronautical Circular AC/AW/022 for acceptable means of compliance for quality inspection on maintenance aspects.

4.3 Audit

4.3.1 An audit is a systematic and independent comparison of the way in which an operation is being conducted against the way in which the published operational procedures say it should be conducted.

4.3.2 Audits should include at least the following quality procedures and processes:
    a) A statement explaining the scope of the audit;
    b) Planning and preparation;
    c) Gathering and recording evidence; and
    d) Analysis of the evidence.

4.3.3 Techniques which contribute to an effective audit are:
    a) Interviews or discussions with personnel;
    b) A review of published documents;
    c) The examination of an adequate sample of records;
    d) The witnessing of the activities which make up the operation; and
    e) The preservation of documents and the recording of observations.

4.4 Auditors

4.4.1 An operator should decide, depending on the complexity of the operation, whether to make use of a dedicated audit team or a single auditor. In any event, the auditor or audit team should have relevant operational and/or maintenance experience.

4.4.2   The responsibilities of the auditors should be clearly defined in the relevant documentation.

4.5   Auditor's Independence

4.5.1   Auditors should not have any day-to-day involvement in the area of the operation and/or maintenance activity that is to be audited. An operator may, in addition to using the services of full-time dedicated personnel belonging to a separate quality department, undertake the monitoring of specific areas or activities by the use of part-time auditors. An operator whose structure and size does not justify the establishment of full-time auditors, may undertake the audit function by the use of part-time personnel from within its own organization or from an external source under the terms of an agreement acceptable to the AACM. In all cases the operator should develop suitable procedures to ensure that persons directly responsible for the activities to be audited are not selected as part of the auditing team. Where external auditors are used, it is essential that any external specialist is familiar with the type of operation and/or maintenance conducted by the operator.

4.5.2   The operator's quality assurance program should identify the persons within the company who have the experience, responsibility and authority to:
a) Perform quality inspections and audits as part of ongoing quality assurance;
b) Identify and record any concerns or findings, and the evidence necessary to substantiate such concerns or findings;
c) Initiate or recommend solutions to concerns or findings through designated reporting channels;
d) Verify the implementation of solutions within specific timescales;
e) Report directly to the quality manager.

4.6   Audit Scope

4.6.1   Operators are required to monitor compliance with the operational and maintenance procedures they have designed to ensure safe operations, airworthy aircraft and the serviceability of both operational and safety equipment. In doing so they should as a minimum, and where appropriate, monitor:
a) Organization;
b) Plans and company objectives;
c) Operational procedures of all relevant staff (e.g. flight crew, cabin crew, etc);
d) Flight safety;
e) Operator certification (AOC/Operations specifications)
f) Supervision;
g) Aircraft performance;
h) All weather operations;
i) Communications and navigational equipment and practices;
j) Mass, balance and aircraft loading;

Page 8 of 15

Alameda Dr. Carlos D'Assumpção, 336-342, Centro Comercial Cheng Feng, 18° andar - Macau
Tel.: (853) 28511213 • Fax: (853) 28338089 • AFTN: VMMCYAYX • E-mail: aacm@aacm.gov.mo

k) Instruments and safety equipment;

l) Manuals, logs, and records;

m) Flight and duty time limitations, rest requirements, and scheduling;

n) Aircraft maintenance/operations interface;

o) Use of the MEL;

p) Maintenance programs and continued airworthiness;

q) The accomplishment of any operational directive, airworthiness directive and any other continued airworthiness requirements made mandatory by the AACM;

r) Maintenance accomplishment;

s) Defect deferral;

t) Dangerous goods;

u) Security;

v) Training.

4.7 Audit Scheduling

4.7.1   A quality assurance program should include a defined audit schedule and a periodic review cycle area by area. The schedule should be flexible, and allow unscheduled audits when trends are identified. Follow-up audits should be scheduled when necessary to verify that corrective action was carried out and that it was effective.

4.7.2   An operator should establish a schedule of audits acceptable to AACM to be completed during a specified calendar period. All aspects of the operation should be reviewed within every 12 month period in accordance with the program

4.7.3   When an operator defines the audit schedule, significant changes to the management, organization, operation, or technologies should be considered as well as changes to the regulatory requirements.

4.8 Monitoring and Corrective Action

4.8.1   The aim of monitoring within the quality system is primarily to investigate and judge its effectiveness and thereby to ensure that defined policy, operational, and maintenance standards are continuously complied with. Monitoring activity is based upon quality inspections, audits, corrective action and follow-up. The operator should establish and publish a quality procedure to monitor regulatory compliance on a continuing basis. This monitoring activity should be aimed at eliminating the causes of unsatisfactory performance.

4.8.2   Any non-compliance identified as a result of monitoring should be communicated to the manager responsible for taking corrective action or, if appropriate, the accountable manager. Such non-compliance should be recorded, for the purpose of further investigation, in order to determine the cause and to enable the recommendation of appropriate corrective action.

4.8.3   The quality assurance program should include procedures to ensure that corrective actions are taken in response to findings. These quality procedures should monitor such actions to verify their effectiveness and that they have been completed. Organizational responsibility and accountability for the implementation of corrective action resides with the department cited in the report identifying the finding. The accountable manager will have the ultimate responsibility for resourcing the corrective active action and ensuring, through the quality manager, that the corrective action has reestablished compliance with the standard required by the AACM, and any additional requirements defined by the operator.

4.8.4   Corrective action. Subsequent to the quality inspection/audit, the operator should establish:
   a) The seriousness of any findings and any need for immediate corrective action;
   b) The origin of the finding;
   c) What corrective actions are required to ensure that the non-compliance does not recur;
   d) A schedule for corrective action;
   e) The identification of individuals or departments responsible for implementing corrective action;
   f) Allocation of resources by the accountable manager, where appropriate.

4.8.5   The quality manager should:
   a) Verify that corrective action is taken by the manager responsible in response to any finding of noncompliance;
   b) Verify the corrective action includes the elements outlined in paragraph 4.8.4 above;
   c) Monitor the implementation and completion of corrective action;
   d) Provide management with an independent assessment of corrective action; implementation and completion;
   e) Evaluate the effectiveness of corrective action through follow-up process.

4.9   Management Evaluation

4.9.1   A management evaluation is a comprehensive, systematic, documented review by the management of the quality system, operational policies and procedures, and should consider:
   a) The results of quality inspections, audits and any other indicators;
   b) The overall effectiveness of the management organization in achieving stated objectives.

4.9.2   A management evaluation should identify and correct trends, and prevent, where possible, future non-conformities. Conclusions and recommendations made as a result of an evaluation should be submitted in writing to the responsible manager for action. The responsible manager should be an individual who has the authority to resolve issues and take action.

4.9.3   The Accountable Manager should decide upon the frequency, format, and structure of internal management evaluation activities.

Note: Where the operator is also a MAR-145 Approved Maintenance Organization, the frequency, format and structure of internal management evaluation activities must not conflict with Aeronautical Circular AC/AW/011, paragraph 4 of MAR-145 AMC 145.65(c)(2).

4.10 Quality System Records

4.10.1 Accurate, complete and readily accessible records documenting the results of the quality assurance program should be maintained by the operator. Records are essential data to enable an operator to analyze and determine the root causes of non-conformity, so that areas of non-compliance can be identified and addressed.

4.10.2 The following records should be retained for a period of 5 years:
a) Audit schedules;
b) Quality inspection and audit reports;
c) Responses to findings;
d) Corrective action reports;
e) Follow-up and closure reports; and
f) Management evaluation reports.

5. Quality Assurance Responsibility for Sub-Contractors

5.1 Sub-Contractors

5.1.1   Operators may decide to sub-contract out certain activities to external agencies for the provision of services related to areas such as:
a) Maintenance;
b) Maintenance management;
c) Ground handling including deicing/anti-icing;
d) Flight support (including performance calculations, flight planning, navigation database and dispatch);
e) Training;
f) Manual preparation.

5.1.2   The ultimate responsibility for the product or service provided by the sub-contractor always remains with the operator. A written agreement should exist between the operator and the sub-contractor clearly defining the safety related services and quality to be provided. The sub-contractor's safety related activities relevant to the agreement should be included in the operator's quality assurance program.

5.1.3   The operator should ensure that the sub-contractor has the necessary authorization/approval when required and commands the resources and competence to undertake the task.

6. Quality System Training

6.1   General

6.1.1   An operator should establish effective, well planned and resourced quality related briefing for all personnel.

6.1.2   Those responsible for managing the quality system and the quality auditors should receive training covering:
a)   An introduction to the concept of the quality system;
b)   Quality management;
c)   The concept of quality assurance;
d)   Quality manuals;
e)   Audit techniques;
f)   Reporting and recording; and
g)   The way in which the quality system will function in the company.

6.1.3   Time should be provided to train every individual involved in quality management and for briefing the remainder of the employees. The allocation of time and resources should be governed by the size and complexity of the operation concerned.

7. Organizations with 20 or Less Full-Time Employees

7.1   Introduction

7.1.1   The requirement to establish and document a Quality System and to employ a Quality Manager applies to all operators. In the context of quality systems therefore, operators should be categorized according to the number of full time staff employees. References to large and small operators elsewhere in the requirements are governed by aircraft capacity (i.e number of seats) and by mass (Maximum Take-Off Mass). Such terminology is not relevant when considering the scale of an operation and the Quality System required.

7.2   Scale of Operation

7.2.1   Operators who employ 5 or less full time staff are considered to be "very small" while those employing between 6 and 20 full time employees are regarded as "small" operators as far as quality systems are concerned. Full-time in this context means employed for not less than 35 hours per week excluding vacation periods.
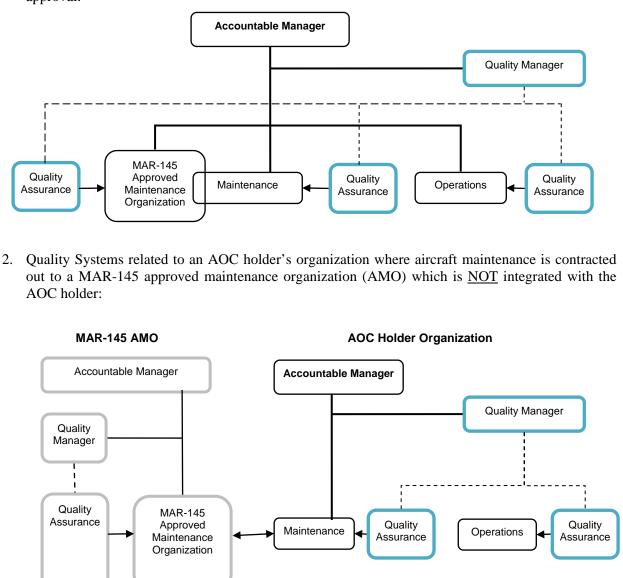
7.2.2　Complex quality systems could be inappropriate for small or very small operators and the clerical effort required to draw up manuals and quality procedures for a complex system may stretch their resources. It is therefore accepted that such operators should tailor their quality systems to suit the size and complexity of their operation and allocate resources accordingly.

7.3　Quality System for Small/Very Small Operators

7.3.1　For small and very small operators it may be appropriate to develop a quality assurance program that employs a checklist. The checklist should have a supporting schedule that requires completion of all checklist items within a specified timescale, together with a statement acknowledging completion of a periodic review by top management. An occasional independent overview of the checklist content and achievement of the quality assurance should be undertaken.

7.3.2　The "small" operator may decide to use internal or external auditors or a combination of the two. In these circumstances it would be acceptable for external specialists and or qualified organizations to perform the quality audits on behalf of the quality manager.

7.3.3　If the independent quality audit function is being conducted by external auditors, the audit schedule should be shown in the relevant documentation.

7.3.4　Whatever arrangements are made, the operator retains the ultimate responsibility for the quality system and especially the completion and follow-up of corrective actions.

Appendix B - Interpretative/Explanatory Material

Quality System – Organization examples

The following diagrams illustrate two typical examples of Quality organizations.

1. Quality System within the AOC holder's organization when the AOC holder also holds a MAR–145 approval.

2. Quality Systems related to an AOC holder's organization where aircraft maintenance is contracted out to a MAR-145 approved maintenance organization (AMO) which is NOT integrated with the AOC holder:

Note: The Quality System and Quality Audit Program of the AOC holder should assure that the maintenance carried out by the MAR-145 approved organization is in accordance with the contract.

Appendix C – Quality System Acceptance Procedure

Macao operators holding an AOC first issued before 01 March 2011 shall following the procedure listed below. New AOC applicant must comply with the requirements in this AC prior to the grant of an AOC.

1. A **Compliance Checklist** on the Air Operator Quality System Requirements shall be submitted to AACM **no later than 30 April 2011**.

2. An operator shall evaluate his/her current systems in place and determine if full compliance with this AC can be achieved on or before **01 September 2011**.

   A. If full compliance cannot be achieved:

   An operator must submit a quality system **implementation plan** endorsed by the Accountable Manager to AACM for acceptance **no later than 30 June 2011**.

   Depending on the complexity of the changes required to achieve full compliance, AACM may allow an operator to extend the full compliance date, provided that there is a detail implementation plan acceptable to the AACM.

   B. If full compliance can be achieved:

   The operator shall ensure that all necessary documents such as any amendments to the relevant manuals and AACM Form Four for the nominated Quality Manager(s) are submitted to AACM for acceptance together with the compliance checklist.

   Note: Where changes to the organizational structure is required to achieve full compliance, operator is advised to plan such organizational structure change carefully and apply proper SMS change management measures.

3. Quality manager must be accepted by the AACM. For the nomination of a quality manager, an operator shall submit an *AACM Form Four* together with all necessary supporting documents to AACM. AACM may require having an interview with the nominee as part of the acceptance process.

   Note: A Quality Manager acceptance process is required regardless of whether the nominee has been accepted by AACM previously. Thus, AACM Form Four with supporting documents for the nominated Quality Manager(s) are required to be submitted to AACM in all cases.