

## Section 4 — Aircraft Engineering and Maintenance (MNT)

### Applicability

Section 4 is applicable to all operators, and addresses aircraft engineering and maintenance functions relevant to the airworthiness of the aircraft, engines and components.

Individual MNT provisions or sub-specifications within a MNT provision that:

- Do not begin with a conditional phrase are applicable unless determined otherwise by the Auditor.
- Begin with a conditional phrase “If the Operator...” are applicable if the Operator meets the condition(s) stated in the phrase.

An operator may choose to have certain functions within the scope of ground handling operations (e.g. aircraft loading, aircraft ground handling) performed by maintenance operations personnel. If this situation exists, the operator must be in conformity with the ISARPs contained in Section 6, Ground Handling Operations (GRH), that are applicable to the ground handling functions performed by maintenance operations personnel.

Where an operator outsources the performance of aircraft engineering and maintenance operational functions to external organizations, the operator retains overall responsibility for ensuring aircraft airworthiness, and must demonstrate processes for monitoring the applicable external organization(s) in accordance with MNT 1.11.7.

### General Guidance

Definitions of technical terms used in this ISM Section 4, as well as the meaning of abbreviations and acronyms, are found in the IATA Reference Manual for Audit Programs (IRM).

Many provisions in this section contain the phrase “organization that performs maintenance (or performs maintenance functions) for the Operator.” This phrase is inclusive and refers to any organizations that might perform maintenance on the operator’s aircraft, either an external maintenance organization or the operator’s own maintenance organization.

The term “maintenance” as used in above-referenced phrase means restoring or maintaining an aircraft, aircraft engine or aircraft component to or in an airworthy and serviceable condition through the performance of functions such as repair, modification, overhaul, inspection, replacement, defect rectification and/or determination of condition.

If a standard or recommended practice requires an operator to ensure that certain provisions (specifically in MNT subsection 4) are satisfied by an organization that performs maintenance or maintenance operational functions for the operator under a maintenance agreement, then the operator monitors such maintenance organization to ensure specifications in the relevant ISARPs are being fulfilled.

If the organization that has a maintenance agreement with the operator subcontracts certain maintenance functions to other maintenance organizations (as agreed between parties), then the operator’s monitoring of the contracted maintenance organization would also ensure such organization is performing oversight of all relevant subcontractors. For example, when an operator contracts with an airframe maintenance provider to conduct base maintenance and such maintenance provider then subcontracts certain maintenance activities or functions to one or more of its subcontractors, the operator’s monitoring would also ensure the contracted airframe maintenance provider is providing proper oversight of the relevant subcontractors.

## 1 Management and Control

### 1.1 Management System Overview

#### MNT 1.1.1

The Operator shall have a management system for maintenance operations that ensures:

- (i) Management of safety and quality in maintenance operations;
- (ii) Supervision and control of maintenance activities;

- (iii) Compliance with applicable regulations and standards of the Operator. **(GM)** ◀

**Auditor Actions**

- ☐ **Identified/Assessed** management system structure for MNT operations.
- ☐ **Interviewed** manager of MNT operations.
- ☐ **Assessed** status of conformity with all other MNT management system ISARPs.
- ☐ **Other Actions** (Specify)

**Guidance**

Refer to the IRM for the definitions of [Maintenance \(Aircraft\)](#) and [Maintenance Operations](#).

Refer to Guidance associated with [ORG 1.1.1](#) located in ISM Section 1.

**MNT 1.1.2**

The Operator shall have a staff of management personnel suitably matched to the scale and scope of maintenance operations to ensure:

- (i) Maintenance of all aircraft is performed in accordance with the Maintenance Program;
- (ii) All maintenance is carried out in accordance with policies and procedures contained in the Maintenance Management Manual (MMM). **(GM)**

**Auditor Actions**

- ☐ **Identified/Assessed** maintenance management structure and individual manager appointments.
- ☐ **Identified** means of ensuring that all maintenance is performed in accordance with the Maintenance Program and the policies and procedures contained in the MMM.
- ☐ **Interviewed** manager(s) of maintenance operations.
- ☐ **Other Actions** (Specify)

**Guidance**

Refer to the IRM for the definitions of [ETOPS](#), [Extended Diversion Time Operations \(EDTO\)](#), [Maintenance Management Manual \(MMM\)](#) and [Maintenance Program](#).

The management personnel represent the maintenance management structure of the operator and are responsible for all maintenance functions. Dependent on the size of the operation and the organizational set up, the maintenance functions may be divided among individual managers or combined, as applicable to the airline structure.

The actual number of persons employed, and their qualifications, are dependent upon the tasks to be performed and thus dependent on the size and complexity of the operation (e.g. route network, line and/or charter operations, ETOPS/EDTO, fleet composition, aircraft complexity and age), number and locations of maintenance facilities and the amount and complexity of maintenance contracts. 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.

**MNT 1.1.3**

The Operator shall have a manager of maintenance operations that is acceptable to the Authority, if required, and is responsible for ensuring:

- (i) The management of safety and security risks to maintenance operations;
- (ii) Maintenance operations are conducted in accordance with conditions and restrictions of the Air Operator Certificate (AOC), and in compliance with applicable regulations and standards of the Operator. **(GM)** ◀

## Auditor Actions

- ☐ **Identified** manager for MNT operations.
- ☐ **Examined** job description of manager for MNT operations (focus: defines authority/accountability/responsibility for risk management/compliance with AOC requirements).
- ☐ **Interviewed** manager of MNT operations.
- ☐ **Interviewed** other managers in MNT operations.
- ☐ **Other Actions** (Specify)

## Guidance

Refer to the IRM for the definitions of [Air Operator Certificate \(AOC\)](#) and [Authority](#).

In most regulatory jurisdictions the individual that is the manager of an operator's maintenance operations is required to be a post holder that is acceptable to the Authority.

Refer to [ORG 1.1.3](#) located in ISM Section 1.

## 1.2 Accountability, Authorities and Responsibilities

### MNT 1.2.1

The Operator shall ensure the management system for maintenance operations defines the safety accountability, authorities and responsibilities of management and non-management personnel that perform functions relevant to aircraft engineering and maintenance. The management system shall also specify:

- (i) The levels of management within maintenance operations with the authority to make decisions regarding risk tolerability with respect to aircraft airworthiness;
- (ii) Responsibilities for ensuring maintenance operations are conducted in accordance with conditions and restrictions of the AOC, applicable regulations and standards of the Operator;
- (iii) Lines of accountability throughout maintenance operations, including direct accountability on the part of senior management for ensuring aircraft airworthiness. **[SMS] (GM) ◀**

## Auditor Actions

- ☐ **Identified/Assessed** defined safety accountability/authorities/responsibilities for ensuring aircraft airworthiness (focus: applicable to management/non-management personnel throughout the maintenance operations organization).
- ☐ **Interviewed** MNT operations manager and/or designated management representative(s).
- ☐ **Examined** job descriptions of selected management/non-management personnel in maintenance operations.
- ☐ **Other Actions** (Specify)

## Guidance

Refer to Guidance associated with [ORG 1.3.1](#) located in ISM Section 1 for expanded information regarding accountability, authority and responsibility as applicable to management and non-management personnel.

### MNT 1.2.2

The Operator shall have a process or procedure for the delegation of duties within the management system for maintenance operations that ensures managerial continuity is maintained when operational managers including, if applicable, post holders are unable to carry out work duties. **(GM) ◀**

## Auditor Actions

- ☐ **Identified/Assessed** processes for delegation of duties when MNT operations managers are absent.
- ☐ **Interviewed** MNT operations manager and/or designated management representative(s).

- ☐ **Examined** example(s) of delegation of duties due to absence of managers.
- ☐ **Other Actions** (Specify)

**Guidance**

The intent of this provision is for an operator to have a process or procedure that ensures a specific person (or perhaps more than one person) is identified to assume the duties of any operational manager that is or is expected to be, for any reason, unable to accomplish assigned work duties.

For the purpose of this provision, the use of telecommuting technology and/or being on call and continually contactable are acceptable means for operational managers to remain available and capable of carrying out assigned work duties.

Refer to Guidance associated with [ORG 1.3.2](#) located in ISM Section 1, which addresses the performance of work duties and the use of telecommuting technology and/or being on call and continually contactable.

**MNT 1.2.3**

The Operator shall ensure a delegation of authority and assignment of responsibility within the management system for maintenance operations for liaison with regulatory authorities, original equipment manufacturers (OEMs) and other external entities relevant to maintenance operations. **(GM)** ◀

**Auditor Actions**

- ☐ **Identified** corporate management individuals with authority for liaison with regulators and other external entities.
- ☐ **Interviewed** accountable executive and/or designated management representative(s).
- ☐ **Interviewed** manager(s) with authority for liaison with regulators and other external entities.
- ☐ **Crosschecked** to identify managers in operational areas with authority for liaison with regulators and other external entities.
- ☐ **Other Actions** (Specify)

**Guidance**

Refer to Guidance associated with [ORG 1.3.3](#) located in ISM Section 1.

**1.3 Maintenance Program****MNT 1.3.1**

The Operator shall provide, for the use and guidance of relevant maintenance and operational personnel, a Maintenance Program that is approved by the relevant Authority and contains information and data for each aircraft type/model and configuration in the Operator's fleet in accordance with specifications in [Table 4.1](#). The Maintenance Program shall satisfy:

- (i) Requirements of the State of Registry;
- (ii) Requirements of the State of Design;
- (iii) Requirements of the Operator;
- (iv) Maintenance specifications provided by the aircraft, engine and component OEMs. **(GM)**

**Auditor Actions**

- ☐ **Identified** an approved maintenance program for each aircraft type.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected maintenance program(s) (content in accordance with specifications in [Table 4.1](#)).
- ☐ **Other Actions** (Specify)

## Guidance

Refer to the IRM for the definitions of [Approved Maintenance Organization \(AMO\)](#), [State of Design](#) and [State of Registry](#).

An aircraft maintenance program is usually approved by the Authority. However, when an operator uses an aircraft registered in a different state, it is possible that the maintenance program could be approved by the authority of the State of Registry.

An operator's Authority typically holds the operator responsible for the definition, the control and the provision of Maintenance Data, and an Approved Maintenance Program for use by the operator and its maintenance organization.

The aircraft is maintained under one approved operator's aircraft maintenance program. When an operator wishes to change from one approved aircraft maintenance program to another approved program, a transfer/bridging check/inspection may need to be performed, as agreed with the Authority, in order to implement the change.

The operator's aircraft maintenance program typically contains a preface that defines the maintenance program contents, the inspection standards to be applied, permitted variations to task frequencies and, where applicable, any procedure to escalate established check/inspection intervals.

A reliability program provides an appropriate means of monitoring the effectiveness of the maintenance program. Maintenance program optimization relies on implementation of the reliability program.

Some operator's approved aircraft maintenance programs, not developed from the MRB Process, use reliability programs as the basis of the approval. The purpose of a reliability program is to ensure the aircraft maintenance program tasks are effective and carried out at appropriate time intervals. Actions resulting from the reliability program may result in the escalation or de-escalation, or addition or deletion, of maintenance tasks, as deemed necessary.

The maintenance program typically contains the following:

- The type/model and registration number of the aircraft, engines and, where applicable, auxiliary power units (APUs) and propellers;
- The name and address of the operator;
- The operator's reference identification of the program document, the date of issue and issue number;
- A statement signed by the operator to the effect the specified aircraft is maintained in accordance with the program and that the program is reviewed and updated as required;
- Contents/list of effective pages of the document;
- Check periods that reflect the anticipated use of the aircraft and where use cannot be anticipated, calendar time limits are included;
- Procedures for the escalation of established check periods, where applicable, and acceptable to the Authority;
- Provision to record date and reference to approved amendments incorporated in the program;
- Details of preflight maintenance tasks accomplished by maintenance personnel and not included in the Operations Manual for action by flight crew;
- The tasks and the periods (intervals/frequencies) at which each part of the aircraft, engines, APUs, propellers, components, accessories, equipment, instruments, electrical and radio apparatus and associated systems and installations are to be inspected, together with the type and degree of inspection;
- The periods when items are checked, cleaned, lubricated, replenished, adjusted and tested;
- Details of specific structural inspections or sampling programs;
- Details of the corrosion control program, when applicable;
- The periods and procedures for the collection of engine health monitoring data;
- The periods when overhauls and/or replacements by new or overhauled parts are to be made;

- A cross-reference to other documents approved by the Authority that contain the details of maintenance tasks related to mandatory life-limitations, Certification Maintenance Requirements (CMRs) and Airworthiness Directives (ADs);

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

- Details of, or cross-reference to, any required Reliability Program or statistical methods of continuous surveillance;
- A statement that practices and procedures to satisfy the program are to the standards specified in the Type Certificate Holder's Maintenance Instructions. When practices and procedures are included in a customized operator's maintenance manual approved by the Authority, the statement refers to this manual;
- Each maintenance task quoted is defined in the definitions section of the program.

An operator's approved aircraft maintenance programs are subject to periodic review to ensure they reflect current Type Certificate Holder's recommendations, revisions to the Maintenance Review Board Report and the mandatory requirements and maintenance needs of the aircraft. The operator reviews the detailed requirements at least annually for continued validity in light of the operating experience.

### MNT 1.3.2

The Operator shall ensure the design and application of the Maintenance Program observes human factors principles. **(GM)**

#### Auditor Actions

- ☐ **Identified** an approved maintenance program for each aircraft type.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** the process for designing maintenance tasks.
- ☐ **Examined** selected Task Cards.
- ☐ **Other Actions** (Specify)

#### Guidance

Refer to the IRM for the definition of [Human Factors Principles](#).

Specifically, with respect to observation of human factor principles in design and application of the maintenance program, the following guidance material provides information regarding the development of maintenance schedules/programs, including the development of the associated Task Cards, hereafter referred to as the "Maintenance Item."

Some Maintenance Items might not be developed through the in-house Task Card design process, but rather would be taken directly from the Design Approval Holder (DAH) who has considered human factors principles in the development process.

In cases where the operator has the requisite capabilities and chooses to develop a Maintenance Item, attention is applied to the Human Factors layout of the Maintenance Item that typically includes, but is not limited to:

- Layout of the Maintenance Item;
- Language used;
- Clear and concise instructions that are as brief and succinct as possible;
- Standardization of all Task Cards, to include the appropriate warnings;
- All notes, warnings and cautions are apparent by the suggested use of boxing, bolding, italicizing and underlining text;
- Clear instructions for the mechanic/inspector as to where to sign, certify, initial, date the task;
- Where possible, the use of color to display Maintenance Items and Task Cards;
- Where a Maintenance Item has important graphic details, the graphics are included;



- Full amplification of some tasks rather than referral to a separate document that may distract the mechanic;
- Referral to the applicable Approved Data.

Guidance material for the application of human factors principles may be found in the ICAO Human Factors Training Manual, Document 9683.

### MNT 1.3.3

The Operator shall ensure amendments to the Maintenance Program:

- Are approved by the Authority unless the Operator has been approved to amend the Maintenance Program without requiring approval of the Authority;
- Are furnished to all organizations and/or persons to whom the Maintenance Program has been issued.

#### Auditor Actions

- ☐ **Identified/Assessed** maintenance program (focus: defines processes for amendment approval and dissemination).
- ☐ **Identified** the organizations and/or persons to which the maintenance program(s) are issued.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected records of recent maintenance program amendments (focus: if applicable, approval by Authority; dissemination to all program users).
- ☐ **Other Actions** (Specify)

## 1.4 Provision of Resources

### MNT 1.4.1

The Operator shall ensure the existence of the facilities, workspace, equipment and supporting services, as well as the work environment, that are necessary to allow all maintenance to be performed in accordance with the Maintenance Program. **(GM)** ◀

**Note:** *Conformity with this provision does not require specifications to be documented by the Operator.*

#### Auditor Actions

- ☐ **Observed/Assessed** physical resources and services (focus: adequacy to meet Maintenance Program needs).
- ☐ **Identified/Assessed** processes for oversight of external maintenance providers (focus: evaluation of facilities/workspace/equipment/supporting services).
- ☐ **Interviewed** MNT operations manager and/or designated management representative(s).
- ☐ **Assessed** adequacy of maintenance facilities, workspace and working environment.
- ☐ **Observed** aircraft part/component installation/replacement (focus: adequate facilities/workspace/equipment for maintenance activity performed).
- ☐ **Observed** line maintenance operations (focus: adequate facilities/workspace/equipment for maintenance activity performed).
- ☐ **Observed** aircraft parts/components management/handling (focus: adequate facilities/workspace/equipment for handling of aircraft parts/components).
- ☐ **Other Actions** (Specify)

#### Guidance

Refer to Guidance associated with [ORG 1.5.2](#) located in ISM Section 1.

Implementation of this standard (i.e. adequacy of physical resources, work environment) is typically assessed through observations made by the auditor(s) during the course of the on-site audit.



## MNT 1.4.2

The Operator shall have a selection process for management and non-management positions within maintenance operations organization that require the performance of functions relevant to aircraft airworthiness. Such process shall ensure candidates are selected on the basis of knowledge, skills, training and experience appropriate for the position. **(GM) ◀**

### Auditor Actions

- ☐ **Identified/Assessed** standards and processes for selection of MNT operations personnel in functions relevant to safety and security of aircraft operations.
- ☐ **Interviewed** MNT operations manager and/or designated management representative(s).
- ☐ **Interviewed** personnel that perform MNT functions relevant to the safety or security of aircraft operations.
- ☐ **Other Actions** (Specify)

### Guidance

A corporate personnel selection policy that applies to all operational areas of the organization will serve to satisfy this specification.

Refer to Guidance associated with [ORG 1.5.3](#) located in ISM Section 1.

## MNT 1.4.3

The Operator shall ensure availability of the facilities, personnel, equipment and other resources, as necessary, for the implementation of management and control functions, as specified in [Table 4.2](#).

### Auditor Actions

- ☐ **Observed** facilities, personnel, equipment and other resources used for the maintenance management and control functions specified in [Table 4.2](#).
- ☐ **Other Actions** (Specify)

## 1.5 Communication



## MNT 1.5.1

The Operator shall have a system that enables effective communication of relevant safety and operational information within the maintenance operations management system and in all areas where maintenance operations are conducted. Such system shall ensure:

- (i) Personnel maintain an awareness of the SMS;
- (ii) Safety-critical information is conveyed;
- (iii) External service providers who conduct outsourced maintenance and/or perform maintenance functions for the Operator are provided with information relevant to operations conducted. **[SMS] (GM) ◀**

### Auditor Actions

- ☐ **Identified/Assessed** system(s) for communicating information relevant to operations within the MNT operations organization.
- ☐ **Interviewed** MNT operations manager and/or designated management representative(s).
- ☐ **Examined** examples of information communication/transfer in MNT operations.
- ☐ **Interviewed** selected non-management operational personnel in MNT operations.
- ☐ **Other Actions** (Specify)

### Guidance

Refer to Guidance associated with [ORG 4.2.1](#) located in ISM Section 1 for expanded information regarding methods of communication.



## 1.6 Documentation System

**MNT 1.6.1** (Intentionally open)

**MNT 1.6.2** (Intentionally open)

### **MNT 1.6.3**

The Operator shall have a system for the management and control of documentation and/or data used directly in the conduct or support of maintenance operations. Such system shall ensure documentation:

- (i) Meets all required elements specified in [Table 1.1](#);
- (ii) Contains legible and accurate information;
- (iii) Is presented in a format appropriate for use in operations. **(GM)** ◀

#### **Auditor Actions**

- ☐ **Identified/Assessed** management and control system for documentation used in MNT operations.
- ☐ **Interviewed** responsible management representative(s).
- ☐ **Examined** selected parts of the MMM and other maintenance operations documents (focus: legibility/accuracy/format; approval as applicable).
- ☐ **Other Actions** (Specify)

#### **Guidance**

Refer to the IRM for the definitions of [Documentation](#), [Electronic Documentation](#) and [Paper Documentation](#).

Refer to [ORG 2.5.1](#) and associated Guidance, and [Table 1.1](#), located in ISM Section 1.

## 1.7 Maintenance Management Manual (MMM)

### **MNT 1.7.1**

The Operator shall have, for the use and guidance of relevant maintenance and operational personnel, a Maintenance Management Manual that is accepted or approved by the Authority. The MMM may be issued in separate parts and shall contain maintenance policies, procedures and information as specified in [Table 4.3](#). The design of the manual shall observe Human Factors principles. **(GM)**

#### **Auditor Actions**

- ☐ **Identified/Assessed** the MMM.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** the MMM (regulatory approval/acceptance and content in accordance with specifications in [Table 4.3](#)).
- ☐ **Other Actions** (Specify)

#### **Guidance**

An MMM is a document that defines how an operator, through its AMO and all contracted AMOs, accomplishes and controls its aircraft maintenance activities. This document typically sets out:

- The description of the maintenance management system and its senior personnel;
- Each location where maintenance is carried out;
- The Approved Data for accomplishing aircraft maintenance;
- The procedures by which Engineering and Maintenance is managed.

The MMM provides all Engineering and Maintenance personnel with the necessary information to enable them to accomplish their duties and allow the Authority to understand and approve how the operator and its AMO comply with the applicable Airworthiness Requirements.

The MMM can comprise one manual or a suite of manuals. The MMM may have specific sections extracted to form a customized manual for distribution to maintenance contractors, line stations and others, as applicable.

The MMM can be a generic term for the MCM, QPM, MOM, QM, IPM, MME and others. The purpose of the MMM is to set forth the procedures, means and methods of the operator in fulfilling its maintenance responsibilities. Compliance with its contents assures fulfillment of the operator's maintenance responsibilities.

The management section in the MMM may be produced as a stand-alone document and made available to the key personnel required to be familiar with its contents.

Working procedures between the operator and AMO are established and may be produced as any number of separate procedures manuals and cross-referenced from the management part of the MMM.

Personnel from both the operator and the AMO are normally expected to be familiar with sections of the manuals that are relevant to the work they carry out.

Responsibilities and procedures for revisions to the management part of the MMM and any associated manuals are typically specified.

The Quality Manager of the operator is normally responsible for monitoring revisions to the MMM unless otherwise agreed by the Authority.

Unless the Authority has agreed via a procedure stated in the amendment section of the MMM that certain defined classes of amendments may be incorporated without prior Authority approval, this process would normally include monitoring revisions to the associated procedures manuals.

The MMM normally has at least the following four main parts to cover the items in [Table 4.3](#):

- Organization and management;
- Maintenance procedures;
- Quality system procedures;
- Contracted maintenance procedures and paperwork.

The MMM also typically contains:

- An organization chart;
- Procedures to ensure:
  - Each aircraft operated is maintained in an airworthy condition;
  - The operational and emergency equipment necessary for an intended flight is serviceable;
  - The Certificate of Airworthiness of each aircraft operated remains valid.
- A description of the quality system;
- A description of the procedure for receiving, amending and distributing all necessary airworthiness data from the type certificate holder or Type Design Organization;
- A statement signed by the operator confirming the MMM and any incorporated documents identified therein reflect the operator's means of compliance with the Authority requirements;
- A description of the MMM amendment control procedure;
- A means of identifying each page of the MMM. This can be in the form of a list of effective pages with each page numbered and either dated or marked with a revision number;
- A description of the system used to distribute the MMM, including a distribution list; for non-scheduled work, temporary copies of the relevant portions of the MMM, or any incorporated reference, may be sent via facsimile transmission;
- A detailed description of the procedures used to ensure that any maintenance tasks required by the maintenance schedule, airworthiness directives or any task required for the rectification of a defect are completed within the required time constraints;

- A statement that indicates the maintenance program meets all applicable instructions for continuing airworthiness developed by the Type Certificate Holder as issued or amended by the operator's reliability program, STC holders, DERs, ODAs and/or DOA;
- A statement that indicates the changes or deviations from the Type Certificate Holder's Maintenance Instructions or OEM maintenance specifications are made in accordance with the operator's approved procedures;
- A description of the evaluation program required by these standards;
- A description of the defect rectification and control procedures, including details of:
  - The methods used to detect and report recurring defects;
  - The procedures for scheduling the rectification of defects whose repair has been deferred. if these procedures have not been incorporated into the MEL preamble.
- The procedures used to report service difficulties in accordance with these standards;
- A description of the technical dispatch procedures, including procedures for ferry-flight authorizations, EDTO (equivalent terms: ETOPS, EROPS, LROPS), all weather operations and/or any other special operations;
- A description of personnel records to be retained;
- A description of the procedure used to ensure the empty weight and balance of each aircraft is recorded in accordance with the applicable State of Registry/Authority requirements;
- Maintenance arrangements and a list of all such arrangements, including the procedure used to communicate to an approved maintenance organization the maintenance requirements for planned and unforeseen maintenance activities, as well as those mandated by airworthiness directives;
- Procedure for revising and maintaining the MMM up to date and current;
- Approval of the Authority through approval of the list of effective pages or, in the case of manuals containing a small number of pages, approval can be identified on each page.

Refer to the Guidance associated with [MNT 1.3.2](#) for information that explains and addresses human factors principles.

### **MNT 1.7.2** (Intentionally open)

#### **MNT 1.7.3**

The Operator shall ensure the MMM is amended as necessary to keep information contained therein up to date and to address:

- (i) Changes to maintenance or airworthiness requirements;
- (ii) Changes in the organization or activities;
- (iii) Inadequacies identified through internal or external audit;
- (iv) Conformity with applicable requirements.

#### **Auditor Actions**

- ☐ **Identified** the process(es) for amending the MMM.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** the MMM for currency.
- ☐ **Examined** the content of selected amendments to the MMM.
- ☐ **Other Actions** (Specify)

### **MNT 1.7.4–1.7.5** (Intentionally open)

**MNT 1.7.6**

The Operator shall ensure a copy of the current version of the MMM, or relevant portions thereof, is promptly made available to:

- (i) Applicable authorities;
- (ii) Each organization or person that performs or certifies maintenance for the Operator;
- (iii) All other organizations or persons to whom the MMM has been issued.

**Auditor Actions**

- ☐ **Identified/Assessed** the process(es) for dissemination of the MMM.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** the distribution list for dissemination of the MMM.
- ☐ **Examined** selected records of MMM and amendment distribution(s) to organizations/persons that perform/certify maintenance.
- ☐ **Other Actions** (Specify)

**MNT 1.7.7**

If the Operator issues relevant portions of the MMM as specified in [MNT 1.7.6](#), the Operator shall ensure policies and procedures contained therein are sufficiently comprehensive such that all relevant guidance and information is available to any maintenance organization or person that performs maintenance for the Operator under that portion of the manual.

**Auditor Actions**

- ☐ **Identified/Assessed** the process(es) for dissemination of the MMM.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** the distribution list for dissemination of the MMM to organizations and/or persons.
- ☐ **Examined** selected records of MMM distribution (portion only) to organizations/persons that perform maintenance.
- ☐ **Other Actions** (Specify)

**1.8 Maintenance Records System****MNT 1.8.1**

The Operator shall have a system for the management and control of maintenance records to ensure the content and retention of such records is in accordance with requirements of the Authority, as applicable, and to ensure operational records are subjected to standardized processes for:

- (i) Identification;
- (ii) Legibility;
- (iii) Maintenance;
- (iv) Retrieval;
- (v) Protection, integrity and security;
- (vi) Disposal, deletion (electronic records) and archiving. **(GM) ◀**

**Auditor Actions**

- ☐ **Identified/Assessed** management and control system for operational records in MNT operations.
- ☐ **Interviewed** responsible management representative(s).
- ☐ **Examined** selected maintenance records.
- ☐ **Observed** AD/SB management (focus: content/retention of AD/SB records are in accordance with requirements of the Authority).

- ❑ **Observed** aircraft parts/components management/handling (focus: content/retention of parts/components records are in accordance with requirements of the Authority).
- ❑ **Other Actions** (Specify)

### Guidance

Refer to the IRM for the definition of [Maintenance Records](#).

The operator is responsible for the maintenance records of the operator's aircraft irrespective whether the records are retained at the operator's location, at a maintenance organization or any other location.

An operator normally receives and retains a completed Certificate of Release to Service from the maintenance organization. The system for storing such maintenance records is described in the operator's MMM.

Methods of storing maintenance records acceptable to the Authority are in paper form, in a computer database or a combination of both methods. Records stored on microfilm or optical disc form are also acceptable.

For paper systems, use of robust material that can withstand normal handling and filing ensures records can remain legible throughout the required retention period.

Computer systems normally have at least one backup system, which is updated within 24 hours of any maintenance performed. Additionally, each computer terminal normally contains program safeguards to prevent any alteration of the database by unauthorized personnel.

Microfilming or optical storage of maintenance records may be carried out at any time and be as legible as the original record and remain so for the required retention period.

Information on times, dates, cycles referred to as "summary maintenance records" are the records that give an overall picture on the state of maintenance of the aircraft and any life-limited aircraft component. The current status of all life-limited aircraft components indicates the component life limitation, total number of hours, accumulated cycles or calendar time and the number of hours/cycles/time remaining before the required expiry time of the component is reached.

The current status of Airworthiness Directives (AD) identifies the applicable ADs 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, this is identified. The AD status includes the date on which the AD was accomplished. If the AD is controlled by flight hours or flight cycles, it includes the aircraft or engine or component total flight hours or cycles, as appropriate. For repetitive ADs, only the last application is recorded in the AD status. The status also specifies which part of a multi-part AD has been accomplished and the method, where a choice is available in the AD.

Details of current modifications and repairs require 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 maintenance organization in accordance with existing national regulations, all detailed documentation necessary to define the change and its approval are to be retained. Scheduled maintenance requirements following STC incorporation are required to be clearly identified as well. The substantiating data may include:

- Compliance program;
- Master drawing or drawing list, production drawings and installation instructions;
- Engineering reports (static strength, fatigue, damage tolerance, fault analysis);
- Ground and flight test program and results;
- Mass and balance change data;
- Maintenance and repair manual supplements;
- Maintenance program changes and instructions for continuing airworthiness;
- Aircraft flight manual supplement.

Maintenance records are required to be stored safely from fire, flood, theft and alteration.

Computer backup discs and cassettes are to be stored in a different location from those containing the current working discs and tape cassettes and in a safe environment.

The operator is required to ensure, when a maintenance organization used by the operator terminates its operation, the maintenance organization returns all retained maintenance records to the operator.

Refer to guidance associated with [ORG 2.6.1](#) located in ISM Section 1.

#### MNT 1.8.2

If the Operator uses an electronic system for the management and control of maintenance operations records, the Operator shall ensure the system provides for a scheduled generation of backup record files associated with maintenance operations. **(GM)** ◀

##### Auditor Actions

- ☐ **Identified/Assessed** management and control system for operational records in MNT operations.
- ☐ **Interviewed** responsible management representative(s).
- ☐ **Examined** selected record(s) of backup files for electronic records.
- ☐ **Other Actions** (Specify)

##### Guidance

Refer to Guidance associated with [ORG 2.6.2](#) located in ISM Section 1.

## 1.9 Aircraft Systems/Equipment

#### MNT 1.9.1

The Operator shall ensure all aircraft in its fleet are equipped with, in accordance with conditions of applicability, the aircraft systems and equipment specified in [Table 4.11](#). **(GM)**

##### Auditor Actions

- ☐ **Identified/Assessed** fleet aircraft systems/equipment (focus: systems/equipment in accordance with [Table 4.11](#) for aircraft types in operator's fleet).
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** records of installation, inspection and/or maintenance of selected systems/equipment.
- ☐ **Observed** line flight operations (FLT/CAB auditors) or inspected static aircraft (focus: sampled aircraft have applicable systems/equipment installed).
- ☐ **Other Actions** (Specify)

##### Guidance

The intent of this provision is that in accordance with conditions of applicability, which includes requirements of the relevant authority, the systems and equipment specified in [Table 4.11](#) are installed on each aircraft type in the operator's fleet.

The condition of applicability of some system or equipment requirements is predicated on the use of an aircraft type in a certain type of operation (e.g. long-range over-water flights). Where an operator has a fleet of an aircraft type of which some are not used in the conditional operation, then the operator would typically have to demonstrate a segregation system that prevents such aircraft from being used in the conditional operation.

The operator or the Authority may prescribe additional requirements for aircraft systems or equipment installation.



## MNT 1.9.2

The Operator *should* ensure all aircraft in its fleet are equipped with, in accordance with conditions of applicability, the aircraft systems and equipment specified in [Table 4.14](#). **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** fleet aircraft systems/equipment (focus: systems/equipment in accordance with [Table 4.14](#) for aircraft types in operator's fleet).
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** records of installation, inspection and/or maintenance of selected systems/equipment.
- ☐ **Observed** line flight operations (FLT/CAB auditors) or inspected static aircraft (focus: sampled aircraft have applicable systems/equipment installed).
- ☐ **Other Actions** (Specify)

### Guidance

The intent of this provision is that in accordance with conditions of applicability, which includes requirements of the relevant authority, the systems and equipment specified in [Table 4.14](#) should be installed on each aircraft type in the operator's fleet.

The condition of applicability of some system or equipment requirements is predicated on the use of an aircraft type in a certain type of operation (e.g. long-range over-water flights). Where an operator has a fleet of an aircraft type of which some are not used in the conditional operation, then the operator would typically have to demonstrate a segregation system that prevent such aircraft from being used in the conditional operation.

The operator or the Authority may prescribe additional requirements for aircraft systems or equipment installation.

## 1.10 Quality Assurance Program

### MNT 1.10.1

The Operator shall have a quality assurance program that provides for auditing of the management system and all functions of maintenance operations to ensure the Operator is:

- (i) Complying with applicable regulations and standards;
- (ii) Satisfying stated maintenance operations needs;
- (iii) Identifying areas requiring improvement;
- (iv) Identifying hazards to operations;
- (v) Assessing the effectiveness of safety risk controls. **[SMS] (GM) ◀**

### Auditor Actions

- ☐ **Identified/Assessed** quality assurance program in maintenance operations (focus: role/purpose within organization/SMS; definition of audit program scope/objectives; description of program elements/procedures for ongoing auditing of management/operational areas).
- ☐ **Interviewed** responsible quality assurance program manager.
- ☐ **Examined** selected maintenance operations audit reports (focus: audit scope/process/organizational interface).
- ☐ **Other Actions** (Specify)

### Guidance

Refer to Guidance associated with [ORG 2.1.1](#) located in ISM Section 1.

**MNT 1.10.2**

The Operator shall have a process for addressing findings that result from audits conducted under the quality assurance program, which ensures:

- (i) Identification of root cause(s);
- (ii) Development of corrective action, as appropriate, to address findings;
- (iii) Implementation of corrective action in appropriate areas of maintenance operations;
- (iv) Evaluation of corrective action to determine effectiveness. **(GM) ◀**

**Auditor Actions**

- ☐ **Identified/Assessed** process for addressing/closing maintenance operations audit findings.
- ☐ **Interviewed** responsible quality assurance program manager.
- ☐ **Examined** selected audit reports/records (focus: identification of root cause, development/implementation of corrective action, follow-up to evaluate effectiveness).
- ☐ **Other Actions** (Specify)

**Guidance**

Refer to Guidance associated with [ORG 2.1.7](#) located in ISM Section 1.

**MNT 1.10.3**

The Operator shall ensure significant issues arising from maintenance operations quality assurance and risk management are subject to management review in accordance with [ORG 4.1.1](#).

**[SMS] (GM) ◀**

**Auditor Actions**

- ☐ **Identified/Assessed** process for management review of maintenance operations quality assurance issues (focus: continual improvement of quality assurance program).
- ☐ **Interviewed** responsible quality assurance program manager.
- ☐ **Examined** selected records/documents of management review of maintenance operations quality assurance program issues (focus: specific issues/changes identified and implemented to improve quality assurance program).
- ☐ **Other Actions** (Specify)

**Guidance**

Refer to [ORG 4.1.1](#), [ORG 4.1.2](#) and associated guidance in ISM Section 1.

**MNT 1.10.4**

The Operator shall ensure functions related to the maintenance operations quality assurance program are performed by qualified personnel that are either employees of the Operator or independent external quality assurance agents.

**Auditor Actions**

- ☐ **Identified/Assessed** the selection and training program for quality assurance auditors.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected auditor qualifications and training records.
- ☐ **Other Actions** (Specify)

**MNT 1.10.5**

The Operator shall have an audit planning process and sufficient resources to ensure audits of maintenance operations are:

- (i) Scheduled at intervals to meet regulatory and management system requirements;
- (ii) Conducted within the scheduled interval. **(GM) ◀**

## Auditor Actions

- ☐ **Identified/Assessed** quality assurance audit planning process in maintenance operations (focus: audits planned/scheduled/conducted in accordance with applicable internal/external requirements).
- ☐ **Identified/Assessed** audit resources (focus: availability of sufficient auditors/other resources to accomplish audit plan).
- ☐ **Interviewed** responsible quality assurance program manager.
- ☐ **Crosschecked** audit plan with selected audit reports, to verify adherence to plan (focus: audits conducted in accordance with audit plan).
- ☐ **Other Action** (Specify)

## Guidance

Refer to Guidance associated with [ORG 2.1.5](#) located in ISM Section 1.



## 1.11 Quality Control of Outsourced Operations and of Products

### MNT 1.11.1A

If the Operator has external service providers conduct outsourced maintenance and/or maintenance functions, the Operator *should* ensure a service provider selection process is in place that ensures:

- (i) Safety-relevant selection criteria are established;
- (ii) Service providers are evaluated against these criteria prior to selection. **(GM)** ◀

## Auditor Actions

- ☐ **Identified/Assessed** selection process for external service providers.
- ☐ **Interviewed** manager and/or designated management representative(s).
- ☐ **Examined** selected records/documents that demonstrate application of the selection process.
- ☐ **Coordinated** to verify implementation of selection process in all operational areas.
- ☐ **Other Actions** (specify)

## Guidance

The intent of this provision is for an operator to define relevant safety and security criteria for use in the evaluation and potential selection of maintenance service providers. This is the first step in the management of external service providers and would take place prior to the operator signing an agreement with a provider. The process need be applied only one time leading up to the selection of an individual service provider.

Refer to the guidance associated with [ORG 1.6.1](#) located in ISM Section 1.

### MNT 1.11.1B

The Operator shall ensure a maintenance agreement has been executed with each external maintenance organization that performs maintenance functions for the Operator; such maintenance agreement shall:

- (i) Specify all maintenance requirements and define all tasks to be performed;
- (ii) Comply with the procedures governing maintenance arrangements, as specified in the MMM. **(GM)**

## Auditor Actions

- ☐ **Identified/Assessed** processes for contract/agreement production/execution with external service providers that conduct outsourced maintenance operations functions.
- ☐ **Interviewed** responsible manager(s) in MNT operations.
- ☐ **Examined** selected maintenance operations outsourcing contracts/agreements (focus: inclusion of maintenance requirements/definition of tasks to be performed; compliance with MMM).
- ☐ **Other Actions** (Specify)

### Guidance

The intent of this provision is to ensure, where an operator is not approved as a maintenance organization or an operator's maintenance organization is an independent organization, there is a contract between the operator and the Approved Maintenance Organization specifying all work to be performed by the Approved Maintenance Organization.

A clear, unambiguous and sufficiently detailed specification of work and assignment of responsibilities ensures that no misunderstanding can arise between the parties concerned (operator, maintenance organization and the State of Registry/Authority) 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.

Special attention is typically paid to procedures and responsibilities to ensure that all maintenance work is performed, service bulletins are analyzed, and decisions taken on accomplishment, airworthiness directives are completed on time and all work, including non-mandatory modifications, is carried out in accordance with approved data and to the latest standards.

The requirement for a maintenance agreement applies to all functions and/or maintenance work outsourced to external maintenance organizations. The content of such agreements may be more or less detailed depending on the complexity and type of the outsourced maintenance function, as well as the type of work to be performed (e.g. from substantial maintenance providers such as heavy maintenance or engine overhaul to simple line maintenance tasks or minor component repair tasks). Accordingly, agreements may be contractual in nature or less complex, such as a work order issued by the operator to the maintenance provider (within the framework of a general outsourcing agreement between the two entities or to address a "one-off" maintenance event).

#### MNT 1.11.2

The Operator shall ensure each maintenance agreement with an external maintenance organization that performs maintenance functions for the Operator documents specific maintenance safety and quality standards required to be fulfilled by the respective external maintenance organization. Such standards shall provide the basis for a monitoring process as specified in [MNT 1.11.7. \(GM\)](#) ◀

### Auditor Actions

- ❑ **Identified/Assessed** processes for contract/agreement production/execution with external service providers of MNT operational functions.
- ❑ **Interviewed** responsible manager(s) in MNT operations.
- ❑ **Examined** MNT operations contracts/agreements (focus: contain or provide reference to specific maintenance safety/quality standards).
- ❑ **Other Actions** (Specify)

### Guidance

In all cases, if maintenance is expected to be accomplished in accordance with specific industry standards, an acceptable agreement identifies and specifies the standards by their exact name.

The following guidance provides information regarding any maintenance work related to aircraft and aircraft components carried out for the operator by external organizations (i.e. contractors) under a formal contract or agreement.

**Note:** *The operator carries the ultimate responsibility for airworthiness and ensures before each flight that all required maintenance has been properly carried out. This includes all maintenance carried out by contractors.*

The formal maintenance agreement document is not intended to provide detailed work instructions to the contractor. Rather, such functions would typically be addressed through procedures established by the operator and contractor.

A Maintenance Agreement typically includes some, but is not necessarily limited to, the following:

- An approval process for the contractor by the operator and where applicable the contractors and/or the operator's Authority;
- A list of facilities where the maintenance is to be carried out, including a list of satellite facilities that the contractor may use;

- A 'Statement of Work' (SOW) for the Maintenance Agreement that contains the detailed technical requirements, including references to maintenance intervals, manuals, Airworthiness Directives (ADs), Service Bulletins (SBs) and operator special requirements. A clear, unambiguous and sufficiently detailed SOW and assignment of responsibilities are required to ensure no misunderstanding arises between the operator, the contractor and the operator's Authority that could result in a situation where the work, which has a bearing on the airworthiness or the serviceability of operator's aircraft, is not properly performed;
- A requirement for the contractor to produce a suitable quality plan for the project;
- Use and control of parts and materials;
- Process for the approval of deviations from maintenance documents;
- A need for an internal evaluation system by the contractor;
- Access by the operator's quality assurance department staff for the purpose of evaluating ongoing quality;
- A reporting structure that immediately notifies the operator of any significant defects;
- A system of completing, reviewing, retaining maintenance records;
- A system of calibration of tooling and equipment;
- A system of operator supplied product;
- A system of inspecting and testing, i.e., a quality control system;
- A system of handling unsatisfactory product;
- A system of handling, storage, packaging and delivery;
- A system of product identification and traceability;
- A system of training by the contractor of its staff as well as a system of training the contractor by the operator;
- A system of Release To Service of an aircraft or component;
- A system for communication between the operator and the contractor;
- A system of periodic review meetings to include some or all of those below:
  - Contract Review Meeting
  - Workscope Planning Meeting
  - Technical Meeting (ADs/CNs/SBs)
  - Commercial and/or Logistics Meeting
  - Quality Meeting
  - Reliability Meeting

### **MNT 1.11.3–1.11.4** (Intentionally open)

#### **MNT 1.11.5**

The Operator shall have a process to maintain a listing of external providers of maintenance services and products, to include:

- (i) Organizations that are currently approved to perform maintenance on the Operator's aircraft, engines, components and/or parts;
- (ii) Vendors that are currently approved to supply, directly to the Operator, parts, components and other materials for use in maintenance of the Operator's aircraft. **(GM)**

#### **Auditor Actions**

- ☐ **Identified/Assessed** the process(es) for tracking external maintenance organizations.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** the list of approved external AMOs (or equivalent).
- ☐ **Other Actions** (Specify)

## Guidance

In establishing conformity with item (ii), it is acceptable to have the listings integrated into the Materials Management process.

### MNT 1.11.6

The Operator shall have a process to ensure relevant training and/or training material is provided to each external organization that performs maintenance functions for the Operator. **(GM)**

## Auditor Actions

- ☐ **Identified/Assessed** the process(es) for providing training documentation to external maintenance organizations.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected training documentation provided to external maintenance organizations.
- ☐ **Other Actions** (Specify)

## Guidance

△ The provision of training and/or training material ensures that external organization(s) are aware of an Operator's processes and procedures to the extent of their impact on the execution and documentation of the maintenance functions which the external organization(s) perform for the Operator.

☐ Establishing the relevance and extent of training and training materials which are provided to the appropriate external organizations is dependent on the Operator's specifics like, for example, administration of paperwork-forms-databases, certification and recording requirements.

☐ Such process to ensure training and training materials is commensurate with the functions performed for the Operator by the external organization and the examples given in this GM are neither a minimum nor a maximum of the type of training which the process is intended to ensure.

### MNT 1.11.7

The Operator shall have monitoring processes to ensure external approved maintenance organizations that perform maintenance for the Operator:

- (i) Comply with applicable regulations and safety and quality requirements;
- (ii) Have procedures that are acceptable to the Authority granting the approval;
- (iii) Perform all maintenance in accordance with requirements of the Operator. **(GM) ◀**

## Auditor Actions

- ☐ **Identified/Assessed** (focus: monitoring process ensures provider fulfils applicable safety/security requirements).
- ☐ **Interviewed** responsible manager(s) in MNT operations.
- ☐ **Examined** selected records/reports resulting from monitoring of maintenance operations service providers (focus: monitoring process ensures provider fulfils applicable safety/security requirements).
- ☐ **Other Actions** (Specify)

## Guidance

Refer to Guidance associated with [ORG 2.2.1](#) located in ISM Section 1.

### MNT 1.11.8

The Operator *should* include auditing as a process for the monitoring of external maintenance organizations that perform maintenance for the Operator. **(GM) ◀**

## Auditor Actions

- ☐ **Identified/Assessed** auditing processes used for monitoring external MNT service providers.
- ☐ **Interviewed** responsible manager(s) in MNT operations.



- ☐ **Examined** selected records/reports resulting from auditing of maintenance operations service providers (focus: audit process ensures provider is fulfilling applicable safety/security requirements).
- ☐ **Other Actions** (Specify)

### Guidance

The operator establishes a plan acceptable to the State of Registry/Authority to specify when and how often the operator's maintenance activities are monitored. Reports are produced at the completion of each monitoring investigation that includes details of discrepancies and non-compliance with procedures or requirements.

The feedback process addresses who is required to rectify discrepancies and non-compliance in each particular case and the procedure to be followed if rectification is not completed within appropriate timescales. The manager responsible for the maintenance organization is also responsible for monitoring and ensuring action on any outstanding items.

To ensure effective compliance with the operator's maintenance activities, the following elements have proven to work well:

- Product sampling: the part inspection of a representative sample of the aircraft fleet;
- Defect sampling: the monitoring of defect rectification performance;
- Concession sampling: the monitoring of any concession allowing extensions to scheduled maintenance;
- On-time maintenance sampling: the monitoring of maintenance intervals (flying hours, calendar time, flight cycles) for aircraft and their components;
- Sampling reports of un-airworthy conditions and maintenance errors.

Refer to Guidance associated with [ORG 2.2.2](#) located in ISM Section 1.

### MNT 1.11.9

The Operator shall have processes that ensure:

- (i) Aircraft parts and materials are only obtained from approved sources;
- (ii) Certification documentation requirements are specified;
- (iii) Traceability to the last certifying organization for used or surplus parts;
- (iv) A statement of conformity or certification test results is retained for hardware and raw materials (e.g. extrusions, sheet or bar stock);
- (v) Inventory storage of consumable material is managed to ensure traceability of manufacturer batch/lot control. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the process(es) for the management and control of parts and materials.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected incoming parts documentation.
- ☐ **Examined** traceability of selected parts.
- ☐ **Observed** aircraft parts/components management/handling (focus: processes for management of acquisition/certification/traceability/inventory for aircraft parts/components).
- ☐ **Other Actions** (Specify)

### Guidance

An external maintenance organization that performs contracted maintenance functions for the operator may perform the tasks specified in i) through v).

An aircraft part fabricated or manufactured for an operator by a non-approved maintenance organization is produced under the quality system of either the operator or the external maintenance organization. Such an arrangement must be approved by the Authority.

An operator is not required to keep records of traceability that would track the use of batch-controlled consumables.

## 1.12 Safety Management

### **Risk Management**

#### **MNT 1.12.1**

The Operator shall have a hazard identification program for maintenance operations that includes a combination of reactive and proactive methods of hazard identification. **[SMS] (GM) ◀**

#### **Auditor Actions**

- ❑ **Identified/Assessed** safety hazard identification program in MNT operations (focus: program identifies hazards to aircraft operations; describes/defines method(s) of safety data collection/analysis).
- ❑ **Identified/Assessed** role of MNT operations in the organization-wide, cross-discipline safety hazard identification program (focus: participation with other operational disciplines).
- ❑ **Interviewed** responsible manager(s) in MNT operations.
- ❑ **Interviewed** person(s) that perform analysis of MNT operational data for the purpose of identifying hazards to aircraft operations.
- ❑ **Examined** examples of hazards to aircraft operations that have been identified through data collection and analysis in MNT operations.
- ❑ **Other Actions** (Specify)

#### **Guidance**

Refer to the IRM for the definitions of [Hazard \(Aircraft Operations\)](#), [Base Maintenance](#), [Line Maintenance](#), [Risk Management](#) and [Safety Risk](#).

Hazard identification is an element of the Safety Risk Management component of the SMS framework.

The operator typically applies its safety hazard identification program to the full scope of maintenance operations associated with maintaining its aircraft, which includes line and base maintenance.

Refer to Guidance associated with [ORG 3.1.1](#) located in ISM Section 1.

#### **MNT 1.12.2**

The Operator shall have a safety risk assessment and mitigation program in maintenance operations that specifies processes to ensure:

- (i) Hazards are analyzed to determine corresponding safety risk(s) to aircraft operations;
- (ii) Safety risks are assessed to determine the requirement for risk mitigation action(s);
- (iii) When required, risk mitigation actions are developed and implemented in maintenance operations. **[SMS] [Eff] (GM) ◀**

#### **Assessment Tool**

#### **Desired Outcome**

- The Operator maintains an overview of its maintenance risks and through implementation of mitigation actions, as applicable, ensures risks are at an acceptable level.

#### **Suitability Criteria (Suitable to the size, complexity and nature of operations)**

- Number and type of analyzed hazards and corresponding risks.
- Means used for recording risks and mitigation (control) actions.
- Safety data used for the identification of hazards.

## Effectiveness Criteria

- (i) All relevant maintenance hazards are analyzed for corresponding safety risks.
- (ii) Safety risks are expressed in at least the following components:
- Likelihood of an occurrence.
  - Severity of the consequence of an occurrence.
  - Likelihood and severity have clear criteria assigned.
- (iii) A matrix quantifies safety risk tolerability to ensure standardization and consistency in the risk assessment process, which is based on clear criteria.
- (iv) Risk register(s) across the maintenance organization capture risk assessment information, risk mitigation (control) and monitoring actions.
- (v) Risk mitigation (control) actions include timelines, allocation of responsibilities and risk control strategies (e.g. hazard elimination, risk avoidance, risk acceptance, risk mitigation).
- (vi) Mitigation (control) actions are implemented to reduce the risk to a level of “as low as reasonably practical”.
- (vii) Identified risks and mitigation actions are regularly reviewed for accuracy and relevance.
- (viii) Effectiveness of risk mitigation (control) actions are monitored at least yearly.
- (ix) Personnel performing risk assessments are appropriately trained in accordance with [ORG 4.3.1](#).

## Auditor Actions

- ☐ **Identified/Assessed** safety risk assessment and mitigation program in MNT operations (focus: hazards analyzed to identify/define risk; risk assessed to determine appropriate action; action implemented/monitored to mitigate risk).
- ☐ **Identified/Assessed** role of maintenance operations in cross-discipline safety risk assessment/mitigation program (focus: participation with other operational disciplines).
- ☐ **Interviewed** responsible manager(s) in MNT operations.
- ☐ **Interviewed** person(s) that perform safety risk assessments in MNT operations.
- ☐ **Examined** selected records/documents that illustrate risk assessment and resulting risk mitigation action(s) in MNT operations.
- ☐ **Other Actions** (Specify)

## Guidance

Refer to the IRM for the definitions of [Risk Register](#), [Safety Risk](#), [Safety Risk Assessment \(SRA\)](#), [Safety Risk Management](#) and [Safety Risk Mitigation](#).

Risk assessment and mitigation is an element of the Safety Risk Management component of the SMS framework.

The operator typically applies its safety risk assessment and mitigation program to the full scope of maintenance operations associated with maintaining its aircraft, which includes line and base maintenance.

Hazards relevant to the conduct of maintenance operations are potentially associated with:

- Weather (e.g. temperature, precipitation);
- Work environment (e.g. lighting, temperature, noise/vibration, ventilation, hazardous/toxic substances, cleanliness, floor condition, body position, physical facility layout changes);
- Infrastructure (e.g. inadequate, uncontrolled or lack of equipment/tools);
- Automation limitations (e.g. poor assumptions based on misunderstanding of automation functionality);
- Foreign Object Debris (FOD);
- Personnel (e.g. not enough, lack or ineffective training, lack of skills, shift work, inadequate shift patterns);
- Aircraft and parts (e.g. different configurations, lack or difficulty of access);

- Technical data (e.g. uncontrolled, not up to date, inadequate layout of Task Cards, lack of understanding or difficulty in using electronic documentation or IT system);
- Inadequate communication (e.g. language differences, comprehension);
- Changes in processes, procedures, IT platforms, organizational, tooling and equipment.

Refer to Guidance associated with [ORG 3.2.1](#) located in ISM Section 1.

## Operational Reporting

### MNT 1.12.3

The Operator shall have an operational safety reporting system in maintenance operations that:

- Encourages and facilitates feedback from personnel to report safety hazards, expose safety deficiencies and raise safety concerns;
- Includes analysis and management action as necessary to address safety issues identified through the reporting system. **[SMS] (GM) ◀**

#### Auditor Actions

- ☐ **Identified/Assessed** operational safety reporting system in MNT operations (focus: system urges/facilitates reporting of hazards/safety concerns; includes analysis/action to validate/address reported hazards/safety concerns).
- ☐ **Interviewed** responsible manager(s) in MNT operations.
- ☐ **Interviewed** person(s) that perform operational safety report review/analysis/follow-up in maintenance operations.
- ☐ **Examined** data that confirm an effective maintenance operations safety reporting system (focus: quantity of reports submitted/hazards identified).
- ☐ **Examined** records of selected maintenance operations safety reports (focus: analysis/follow-up to identify and address reported hazards/safety concerns).
- ☐ **Other Actions** (Specify)

#### Guidance

Safety reporting is a key aspect of SMS hazard identification and risk management.

Safety issues are generally associated with the various operations (internal and outsourced) that are conducted for the purpose of ensuring aircraft are maintained in an airworthy condition.

Refer to Guidance associated with [ORG 3.1.2](#) located in ISM Section 1.

### MNT 1.12.4

The Operator *should* have a confidential safety reporting system in maintenance operations that encourages and facilitates the reporting of events, hazards and/or concerns resulting from or associated with human performance in maintenance operations. **(GM) ◀**

#### Auditor Actions

- ☐ **Identified/Assessed** confidential safety reporting system in MNT operations (focus: system urges/facilitates reporting of events/hazards/safety concerns caused by humans; report/reporters are de-identified; includes analysis/action to validate/address reported hazards/safety concerns).
- ☐ **Interviewed** responsible manager(s) in MNT operations.
- ☐ **Examined** records of selected maintenance operations confidential safety reports (focus: report/reporter de-identification; analysis/follow-up to identify/address reported hazards/safety concerns).
- ☐ **Other Actions** (Specify)

#### Guidance

Refer to the IRM for the definitions of [Human Factors Principles](#) and [Human Performance](#).

Refer to Guidance associated with [ORG 3.1.3](#) located in ISM Section 1.

### Safety Assurance

#### MNT 1.12.5

The Operator shall have processes for setting safety performance indicators (SPIs) and, as applicable, safety performance targets (SPTs) as means to monitor its safety performance, achievement of its safety objectives and to validate the effectiveness of risk controls. **[SMS] (GM) ◀**

#### Auditor Actions

- ☐ **Identified/Assessed** program for setting SPIs and SPTs in maintenance operations (focus: program defines the development and implementation of SPIs that are aligned with safety objectives).
- ☐ **Interviewed** responsible manager(s) in maintenance operations.
- ☐ **Examined** selected performance indicators (focus: SPIs and SPTs are being used to monitor operational performance toward effectiveness of risk controls and achievement of safety objectives).
- ☐ **Examined** selected records/documents that identify tracking of maintenance operations SPIs and SPTs (focus: tracking used to assess/monitor operational safety performance, assess/validate risk control effectiveness).
- ☐ **Other Actions** (Specify)

#### Guidance

Refer to the IRM for the definitions of [Safety Assurance](#), [Safety Objective](#), [Safety Performance Indicator \(SPI\)](#) and [Safety Performance Target \(SPT\)](#).

Setting SPIs that are consistent with safety objectives is an element of the Safety Assurance component of the SMS framework.

SPIs are used by an operator to track and compare its operational performance against the achievement of its safety objectives and to focus attention on the performance of the organization in managing operational risks and maintaining compliance with relevant regulatory requirements.

SPTs define short-term and medium-term safety performance management desired achievements. They act as 'milestones' that provide confidence that the organization is on track to achieving its safety objectives and provide a measurable way of verifying the effectiveness of safety performance management activities. The setting of SPTs is normally accomplished after considering what is realistically achievable and, where historical trend data are available, the recent performance of the particular SPI.

It is not always necessary or appropriate to set or define SPTs as there could be some SPIs that are better monitored for trends rather than against a targeted number. Safety reporting is an example of when having a target could either discourage people not to report (if the target is not to exceed a number) or to report trivial matters to meet a target (if the target is to reach a certain number).

Refer to Guidance associated with [ORG 1.4.1](#) (safety objectives) and [ORG 1.4.2](#) (SPIs and SPTs) located in ISM Section 1.

### SMS Training

#### MNT 1.12.6

The Operator shall have a program that ensures its aircraft engineering and maintenance personnel are trained and competent to perform SMS duties. The scope of such training shall be appropriate to each individual's involvement in the SMS. **[SMS] (GM) ◀**

**Note:** *The specifications of this provision are applicable to personnel of the Operator that perform aircraft engineering and maintenance functions.*

#### Auditor Actions

- ☐ **Identified/Assessed** SMS training program for maintenance operations (focus: program ensures training for the operator's maintenance operations personnel as appropriate to individual SMS involvement).

- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected initial and recurrent MNT training curricula/syllabi for management/non-management personnel (focus: training in individually relevant SMS duties/responsibilities).
- ☐ **Examined** selected MNT management/non-management personnel training records (focus: completion of SMS training).
- ☐ **Other Actions** (Specify)

## Guidance

Refer to the IRM for the definition of [Operational Function \(Aircraft Operations\)](#).

SMS training is an element of the Safety Promotion component of the SMS framework.

Refer to Guidance associated with [ORG 4.3.1](#) located in ISM Section 1.

## MNT 1.12.7

If the Operator outsources aircraft engineering and maintenance operational functions to external service providers, the Operator *should* have a program that ensures personnel of external service providers are trained and competent to perform SMS duties. The scope of such training *should* be appropriate to individual involvement in the Operator's SMS. **[SMS] (GM) ◀**

## Auditor Actions

- ☐ **Identified/Assessed** SMS training program for maintenance operations (focus: program ensures training for maintenance operations personnel of external service providers as appropriate to individual SMS involvement).
- ☐ **Interviewed** SMS manager and/or designated management representative(s).
- ☐ **Examined** selected outsourcing contracts/agreements (focus: inclusion of requirement of SMS training for applicable service provider personnel).
- ☐ **Examined** selected records/reports resulting from monitoring of service providers (focus: monitoring process ensures applicable personnel of service providers have completed SMS training).
- ☐ **Other Actions** (Specify)

## Guidance

SMS training is an element of the Safety Promotion component of the SMS framework.

Refer to Guidance associated with [ORG 4.3.2](#) located in ISM Section 1.

# 2 Maintenance Control

## 2.1 Control System

### MNT 2.1.1

The Operator shall have a maintenance control system that is in accordance with procedures acceptable to the Authority and ensures:

- (i) Each aircraft is maintained in an airworthy condition;
- (ii) Operational and emergency equipment necessary for flight is serviceable;
- (iii) The Certificate of Airworthiness of each aircraft remains valid;
- (iv) The maintenance of the aircraft is performed in accordance with the Maintenance Program as specified in [MNT 1.3.1](#).

☐

## Auditor Actions

- ☐ **Identified/Assessed** the system for control of aircraft maintenance.
- ☐ **Identified** the procedures for renewal of certificate of airworthiness (CoA).
- ☐ **Interviewed** responsible manager(s).



- ☐ **Examined** selected individual aircraft records for CoA.
- ☐ **Other Actions** (Specify)

## MNT 2.1.2

The Operator shall have guidance and procedures to ascertain if trends for oil consumption are such that an aircraft has sufficient oil to complete each flight. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** guidance/procedures for monitoring aircraft engine oil consumption (focus: oil consumption monitored; trends identified for individual aircraft; consumption trends accounted for prior to each flight to ensure completion).
- ☐ **Interviewed** responsible operational control manager(s).
- ☐ **Examined** selected aircraft oil consumption records (focus: consumption monitored, trends identified and accounted for prior to flights).
- ☐ **Other Actions** (Specify)

### Guidance

The designation of a minimum oil quantity is typically provided by the manufacturer, while the determination, monitoring and replenishment of oil supply are the responsibilities of engineering and maintenance and/or the flight crew in accordance with ISM Section 2 (FLT), [Table 2.2](#), item v).

## 2.2 Maintenance Planning

### MNT 2.2.1

The Operator shall have a system for forecasting and tracking required maintenance activities.

### Auditor Actions

- ☐ **Identified/Assessed** the system for forecasting and tracking required maintenance activities.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** maintenance scheduling/planning personnel.
- ☐ **Examined** selected scheduled/planned maintenance tasks.
- ☐ **Observed** AD/SB management (focus: planning system includes tracking/forecasting of AD/SB action/limits).
- ☐ **Other Actions** (Specify)

### MNT 2.2.2

The Operator shall have a system for tracking hours, cycles and calendar time for aircraft, engines and life-limited components.

### Auditor Actions

- ☐ **Identified/Assessed** the system for tracking hours, cycles and calendar time for aircraft, engines and life-limited components.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** one aircraft, engine and life-limited component.
- ☐ **Other Actions** (Specify)

## 2.3 Parts Installation

### MNT 2.3.1

The Operator shall have a process to ensure that no new part is installed on an aeronautical product unless such part meets the standards of airworthiness applicable to the installation of new parts and, in addition, meets a minimum of one of the following:

- (i) The new part has marking identifying it as a part specified in the type design conforming to a recognized national or international standard, or

- (ii) The new part has been approved for use on an aeronautical product, in accordance with the type certificate/STC, if the part was originally designed and manufactured for non-aeronautical use, or
- (iii) The new part was manufactured under a Parts Manufacturer Approval (PMA), or
- (iv) The new part was produced by the Operator using approved procedures for the purpose of maintaining or altering its own aeronautical product. **(GM)**

## Auditor Actions

- ☐ **Identified/Assessed** the process for managing and controlling new parts and parts installation.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Observed** inspection of incoming parts.
- ☐ **Examined** selected parts installed on aircraft as new parts.
- ☐ **Observed** aircraft part/component installation/replacement (if applicable) (focus: new part/component being installed meets applicable standards of airworthiness).
- ☐ **Observed** aircraft parts/components management/handling (focus: control process for ensuring new parts meet applicable standards of airworthiness).
- ☐ **Other Actions** (Specify)

## Guidance

The operator is responsible for providing an external AMO with approved documentation that contains information about parts allowed to be installed on its aircraft. Such documentation enables the external AMO to validate the airworthy condition of the part and its certification for installation on the aeronautical product being maintained. The “approved documentation” category typically includes as necessary, without being limited to, any of the following: MMM, IPC (including Supplements), AD, SB, Work Order, Repair Order, Form 8130-3/EASA Form 1/or equivalent.

The production of parts by an operator for its own use, as specified in item iv), is acceptable provided there are approved procedures identified in the MMM.

## MNT 2.3.2

The Operator shall have a process to ensure that no used part is installed on an aeronautical product unless such part meets the standards of airworthiness applicable to the installation of used parts and is any of the following:

- (i) An airworthy part that has been removed from an aircraft for immediate installation on another aircraft, **or**
- (ii) An airworthy part that has undergone maintenance for which a maintenance release has been signed by an appropriately rated Approved Maintenance Organization (AMO), **or**
- (iii) An airworthy part that has undergone an approved repair or alteration that restored the certificated level of airworthiness to a used part. **(GM)**

## Auditor Actions

- ☐ **Identified/Assessed** the process for managing and controlling used parts and parts installation.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected parts installed on aircraft for certificates.
- ☐ **Observed** aircraft part/component installation/replacement (if applicable) (focus: used part/component being installed meets applicable standards of airworthiness).
- ☐ **Observed** aircraft parts/components management/handling (focus: control process for ensuring used parts meet applicable standards of airworthiness).
- ☐ **Other Actions** (Specify)

## Guidance

The operator is responsible for providing an external AMO with approved documentation that contains information about parts allowed to be installed on its aircraft. Such documentation enables the external AMO to validate the airworthy condition of the part and its certification for installation on

the aeronautical product being maintained. The “approved documentation” category typically includes as necessary, without being limited to, any of the following: MMM, IPC (including Supplements), AD, SB, Work Order, Repair Order, Form 8130-3/EASA Form 1/or equivalent.

## MNT 2.3.3

The Operator shall have a process to ensure that no used life-limited part is installed on an aeronautical product unless such part meets the standards of airworthiness applicable to the installation of life-limited parts and:

- (i) The technical history of the part is available to demonstrate the time in service, as authorized for that part in the type certificate governing the installation, has not been exceeded;
- (ii) The technical history referred to in sub-paragraph i) is incorporated into the technical record for the aeronautical product on which the part is installed. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the process for managing and controlling used life-limited parts and parts installation.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** personnel that execute procedures for tracking life-limited parts.
- ☐ **Traced** the technical history of selected life-limited parts.
- ☐ **Observed** aircraft part/component installation/replacement (if applicable) (focus: used life-limited part/component being installed meets applicable standards of airworthiness).
- ☐ **Observed** aircraft parts/components management/handling (focus: control process for ensuring used life-limited parts meet applicable standards of airworthiness).
- ☐ **Other Actions** (Specify)

### Guidance

The operator is responsible for providing an external AMO with approved documentation that contains information about parts allowed to be installed on its aircraft.

In general, it is best for an operator to have a fully traceable history for all life-limited parts. Not all parts have a fixed life. The life of some parts might be variable depending on the way the part has been used in the past. For example, load-bearing parts (e.g. landing gear components) that can be installed on different aircraft types (e.g. A319, A320, A321) will have a shorter life if installed on the heavier aircraft (as opposed to the same part installed on a lighter aircraft). Therefore, a complete history of these types of components is critical in knowing exactly when the life of the part will expire.

For parts that have a fixed life (e.g. batteries, slides), traceability to birth is not a requirement. However, in such cases, it is very important that the operator has documentation that shows clearly that the used part has not exceeded its airworthiness life limit.

## 2.4 Deferred Maintenance

### MNT 2.4.1

The Operator shall have a maintenance control function that is responsible for approving, controlling, monitoring and scheduling non-routine and deferred maintenance activities, including MEL/CDL requirements.

### Auditor Actions

- ☐ **Identified** the description of the maintenance control center (MCC) (or equivalent).
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** personnel responsible for selected maintenance control functions.
- ☐ **Examined** maintenance control processes/procedures.
- ☐ **Other Actions** (Specify)

## MNT 2.4.2

The Operator shall have a process to ensure deferred maintenance items (defects) are tracked and corrected within the required intervals prescribed by the MEL, CDL or the appropriate maintenance data. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the process(es) for managing deferred maintenance items.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** MCC personnel.
- ☐ **Examined** selected records of deferred maintenance items.
- ☐ **Traced** the tracking and correction of selected deferred maintenance item(s).
- ☐ **Observed** line maintenance operations (focus: Open/closed MEL/CDL and other deferred maintenance items are being deferred in accordance with approved MEL/CDL requirements or the appropriate maintenance data).
- ☐ **Other Actions** (Specify)

### Guidance

Refer to the IRM for the definition of [Maintenance Data](#).

The intent of this provision is to ensure an operator has a process to rectify all aircraft defects within the limits prescribed by the approved MEL, CDL or the appropriate maintenance data. Postponement of any defect rectification cannot typically be permitted without the operator's awareness and agreement, and in accordance with a procedure approved by the State of Registry/Authority.

## MNT 2.4.3

If the Operator has a MEL/CDL items short-time extension/deviation approval process, the Operator shall ensure the process is approved by the Authority. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the process for MEL/CDL short-time escalation approval.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected records that reflect MEL/CDL short-term escalation approval.
- ☐ **Observed** line maintenance operations (focus: Open/Closed MEL/CDL items are being deferred in accordance with approved MEL/CDL requirements).
- ☐ **Other Actions** (Specify)

### Guidance

An acceptable short-time extension/deviation approval process from the established MEL/CDL typically ensures that use of such a process is possible only in exceptional circumstances and with sound justification.

## 2.5 Continuing Airworthiness Information

### MNT 2.5.1

The Operator shall have processes to:

- (i) Obtain and assess continuing airworthiness information, including Airworthiness Directives (ADs), Alert Service Bulletins and recommendations from the organizations responsible for aircraft type design, and
- (ii) Implement the resulting actions that are mandatory or considered necessary in accordance with procedures acceptable to the Authority. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the process(es) for obtaining, assessing and implementing ADs and ASBs.
- ☐ **Interviewed** responsible manager(s).

- ☐ **Examined** selected records of AD and SB compliance, including Task Cards.
- ☐ **Traced** selected AD(s) and/or SB(s) from receipt to implementation.
- ☐ **Observed** AD/SB management (focus: AD/SB process includes identification, planning, accomplishment, certification, recording, follow-up monitoring).
- ☐ **Observed** line maintenance operations (focus: ADs for which compliance can be physically checked, if applicable).
- ☐ **Other Actions** (Specify)

### Guidance

Refer to the IRM for the definitions of [Authority](#), [Service Bulletin](#) (which includes the definition of Alert Service Bulletin) and [Design Approval Holder \(DAH\)](#).

Continuing airworthiness information and recommendations typically include:

- Airworthiness Directives that are developed by the Authority;
- Alert Service Bulletins, Airworthiness Limitations, maintenance planning and accomplishment instructions that are developed by the Type Design Organization(s) in accordance with their obligations as Design Approval Holder (DAH) for the respective product.

If improvements identified in the assessment process are considered by the operator as necessary to meet its safety and reliability needs, the current planning, accomplishment instructions, and/or airworthiness limitations may need to be adjusted through the implementation process.

### MNT 2.5.2

The Operator shall have a process to monitor and assess maintenance and operational experience with respect to aircraft continuing airworthiness as prescribed by the relevant Authority. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the process(es) for monitoring/assessing maintenance and operational experience in relation to continuing airworthiness.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** personnel that execute procedures that address continuing airworthiness.
- ☐ **Other Actions** (Specify)

### Guidance

Aircraft continuing airworthiness is usually prescribed by the authority of the State of Registry. However, it is possible that continuing airworthiness instructions could be affected by the authority of the State of the Operator and/or the State of Design.

### MNT 2.5.3

The Operator shall have a program for the management of the minimum equipment lists (MELs) used in its fleet operations. Such program shall ensure MELs:

- (i) Are approved by the State of the Operator and/or State of Registry if applicable;
- (ii) Include the latest applicable MMEL provisions released by the Type Certificate Holder(s);
- (iii) Are relevant to and customized for the type/model of aircraft in the Operator's fleet;
- (iv) Identify applicable maintenance procedures called upon by the MEL items and such procedures are readily available for implementation by the appropriate maintenance personnel;
- (v) Include, as applicable, aircraft systems and equipment required for operations in conformity with special authorizations as specified in [FLT 1.2.1](#). **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the procedure(s) for revising the MEL per the MMEL applicable revision.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected records of MEL usage requiring an (M) procedure.

- ❑ **Examined** MEL (focus: MEL revision is in conformity with the latest applicable MMEL provisions and is customized for the type/model of aircraft in operator's fleet, including required equipment for operations in accordance with applicable special authorizations).
- ❑ **Observed** line maintenance operations (focus: MEL is customized for the applicable aircraft type/model).
- ❑ **Other Actions** (Specify)

## Guidance

Refer to the IRM for the definitions of [Minimum Equipment List \(MEL\)](#) and [Master Minimum Equipment List \(MMEL\)](#).

The relevance and customization of the MEL is performed by the operator to reflect the configuration particular to each aircraft type in its fleet (e.g. the long-range or extended-range version, the engine type/model, the optional equipment installed etc.). The MEL typically does not include MMEL provisions that are not relevant to the actual configuration of the operated aircraft.

The timeframe in which the applicable MMEL revisions released by the type certificate holder (TCH) are incorporated into the MEL is acceptable to the Authority.

The maintenance procedures as specified in (iv) are identified by an (M) symbol in the MEL.

The intent is that all maintenance procedures are developed to a sufficient level.

## 2.6 Repairs and Modifications

### MNT 2.6.1

The Operator shall have a process to ensure all modifications and repairs:

- (i) Are carried out using approved data;
- (ii) Comply with airworthiness requirements of the Authority and State of Registry.

### Auditor Actions

- ❑ **Identified/Assessed** the process(es) for managing modifications and repairs.
- ❑ **Identified/Assessed** the procedures for maintaining technical records of modifications and repairs.
- ❑ **Interviewed** responsible manager(s).
- ❑ **Examined** selected records of aircraft modification(s) and/or repair(s).
- ❑ **Observed** aircraft part/component installation/replacement (focus: installation/replacement accomplished using approved data/in accordance with regulations).
- ❑ **Observed** AD/SB management (focus: AD/SB process ensures modifications/repairs accomplished using approved data/in accordance with regulations).
- ❑ **Observed** line maintenance operations (focus: Compare the repair status and the physical status of the aircraft/engine(s)/propeller(s) and their repaired components as applicable).
- ❑ **Other Actions** (Specify)

## 2.7 Defect Recording and Control

### MNT 2.7.1

The Operator shall have processes for defect recording and control, including the management of recurring defects, to address:

- (i) Documenting troubleshooting history;
- (ii) Tracking chronic or repetitive unserviceable items;
- (iii) Implementing instructions for corrective action;
- (iv) Ensuring rectification takes into account the methodology used in previous repair attempts.



## Auditor Actions

- ☐ **Identified/Assessed** the process(es) for recording and controlling defects.
- ☐ **Identified/Assessed** the process(es) for tracking and correcting chronic or repetitive unserviceable items.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** personnel that execute procedures that address chronic or repetitive unserviceable items.
- ☐ **Examined** corrective action records for selected chronic unserviceable items.
- ☐ **Traced** the process for developing corrective action for chronic unserviceable item(s).
- ☐ **Other Actions** (Specify)

## 2.8 Extended Diversion Time Operations (EDTO)

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**MNT 2.8.1** (Intentionally open)

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### MNT 2.8.2

If the Operator is approved to operate twin engine aircraft in ETOPS/EDTO conditions, the Operator shall ensure compliance with:

- (i) Maintenance requirements applicable to the respective operations and to the specific type(s) of aircraft operated under ETOPS/EDTO.
- (ii) The requirements specified in [Table 4.5](#).

All ETOPS/EDTO requirements, including supportive program procedures, duties and responsibilities, shall be identified for and be subject to revision.

## Auditor Actions

□

☐ **Identified/Assessed** regulatory approval for the conduct of ETOPS/EDTO.

☐ **Identified** twin engine aircraft types approved for the conduct of ETOPS/EDTO.

△

☐ **Identified/Assessed** maintenance program for twin engine aircraft approved for the conduct of ETOPS/EDTO (focus: compliance with applicable regulatory/OEM requirements and satisfaction of all eligible requirements specified in [Table 4.5](#)).

☐ **Interviewed** responsible manager(s).

☐ **Examined** selected ETOPS/EDTO aircraft maintenance records (focus: compliance with maintenance program requirements).

☐ **Other Actions** (Specify)

⊗

## 2.9 Aircraft Recorders

### MNT 2.9.1

The Operator shall have a Maintenance Program that provides for the periodic conduct of operational checks, functional checks and evaluations of recordings from the Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR) to ensure the continued serviceability of the recording systems. Such program shall ensure checks and/or evaluations of the recording systems:

- (i) Are conducted at least annually or at an extended interval approved by the Authority;
- (ii) For the FDR, include analysis of the recorded data validity, quality, and system calibration (if applicable) in accordance with the manufacturer's requirements or as required by the Authority;
- (iii) For the CVR, include analysis of the recorded audio data validity, quality and intelligibility in accordance with the manufacturer's requirements or as required by the Authority. **(GM)**

## Auditor Actions

- ☐ **Identified/Assessed** process(es) for checking/evaluating the serviceability of FDR and CVR systems (focus: inspections/evaluations conducted annually unless there is an approved extension; recorded data is analyzed and systems are calibrated as required).
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected records of FDR and CVR serviceability checks/evaluations.
- ☐ **Other Actions** (Specify)

## Guidance

The intent of this provision is for the operator to have a Maintenance Program that provides for the periodic conduct of operational checks, functional checks and evaluations of recordings from the FDR and CVR to ensure the continued serviceability of and provision of appropriate recordings by such equipment.

This provision establishes no limitation with respect to “On/Off aircraft” performance of the maintenance tasks enabling the operator to be in conformity with the provisions as long as the content and periodicity of the tasks follow the manufacturer’s requirements or requirements of the Authority.

△ The use of the wording “manufacturer’s requirements” in this provision refers to requirements from the aircraft manufacturer (i.e. the holder of the airworthiness approval for the installation design of the flight recorder system as specified by TC or STC) and the manufacturer(s) of the equipment (i.e. recorders).

The “system calibration” requirement is applicable when a recorder system has dedicated sensors and the integrity and calibration of those sensors are not checked by other means.

△ It is expected that a “readout report” is produced to document each time a recording assessment/analysis has been performed by the operator or by an external service provider for the operator.

△ The specifications of this provision are also applicable, in their respective parts, to the case of “integrated recorders” that collect/record data through multiple systems contained within a single recording unit. Such integrated systems might include, in one unit, any combination of an FDR, CVR, AIR or DLR.

It is recognized that an operator with an FDA program that comprises aircraft recorder and other equipment that satisfies all requirements of [MNT 2.9.1](#) may use such program as the means of conforming with this standard.

△ In the absence of requirements from both the manufacturer and the Authority, the operator would typically have to develop its own recorder evaluation requirements.

☐ The Maintenance Program referred to in this standard is expected to comprise tasks in addition to the recorder system self-test or built-in-test functions, unless specified otherwise by the manufacturer or approved by the Authority.

## MNT 2.9.2

If the Operator uses aircraft with Data Link Communication (DLC) capabilities and such aircraft are equipped with a Data Link Recorder (DLR), the Operator shall have a DLR Maintenance Program that includes a periodic evaluation of the recording system and an assessment of DLR performance:

- (i) In accordance with the manufacturer’s requirements or as required by the Authority;
- (ii) At least every 24 months or, if applicable, at an extended interval approved by the Authority.  
(GM)

## Auditor Actions

- ☐ **Identified/Assessed** Maintenance Program(s) of aircraft that have data link recording capability (focus: inspections/evaluations conducted biennially unless there is an approved extension; recorded data is analyzed).
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected records of FDR and/or CVR (with DLR) serviceability checks/evaluations (focus: biennial analysis of recorded data).
- ☐ **Other Actions** (Specify)

## Guidance

Refer to the IRM for the definition of [Data Link Recorder \(DLR\)](#).

The intent of this provision is for an operator to have a DLR maintenance program that is applicable to all DLRs installed on aircraft in the operator's fleet. Such program provides for the periodic conduct of evaluations of recordings from the DLR to ensure a continued recording capability and that accurate and usable data are provided by the respective aircraft equipment.

A DLR may be integrated with a CVR, an FDR, or with a combination FDR/CVR unit.

△ The use of the wording "manufacturer's requirements" in this provision refers to requirements from the aircraft manufacturer (i.e. the holder of the airworthiness approval for the installation design of the flight recorder system as specified by TC or STC) and/or the equipment (i.e. recorder) manufacturer.

△ In the absence of requirements from both the manufacturer and the Authority, the operator would typically have to develop its own DLR evaluation requirements.

□ The Maintenance Program referred to in this standard is expected to comprise tasks in addition to the recorder system self-test or built-in-test functions, unless specified otherwise by the manufacturer or approved by the Authority.

## 2.10 Electronic Navigation Data Management

### MNT 2.10.1

If the Operator uses aircraft with electronic navigation capabilities, the Operator shall have a procedure to ensure the timely insertion of current and unaltered electronic navigation data to all applicable aircraft. **(GM)**

## Auditor Actions

- ☐ **Identified/Assessed** the procedure(s) for inserting/loading electronic data into aircraft navigation systems.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected records of electronic navigation data insertion/loading.
- ☐ **Observed** line maintenance operations (focus: verify currency of aircraft navigation databases).
- ☐ **Other Actions** (Specify)

## Guidance

The intent of this provision is to ensure a procedure for the insertion of databases for use in aircraft navigation systems prior to the first flight on the effective date for the new database.

## 2.11 Reduced Vertical Separation Minima (RVSM)

### MNT 2.11.1

If the Operator is authorized for RVSM operations, the Operator shall have procedures that ensure aircraft used in such operations are maintained in a manner to continuously meet airworthiness requirements necessary for the safe conduct of RVSM operations. Such procedures shall be in accordance with requirements of the aircraft OEM.

#### Auditor Actions

- ☐ **Identified/Assessed** the program for maintenance and repair of aircraft used in RVSM operations.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** frontline maintenance personnel.
- ☐ **Examined** maintenance records for selected RVSM aircraft.
- ☐ **Other Actions** (Specify)

## 2.12 Reporting to the Authority

### MNT 2.12.1

The Operator shall have a procedure to provide the Authority with aircraft in-service information as prescribed by the Authority. **(GM)**

#### Auditor Actions

- ☐ **Identified/Assessed** the procedure(s) for providing continuing airworthiness information to the Authority.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** personnel that provide airworthiness information to the Authority.
- ☐ **Examined** selected airworthiness reports to the Authority.
- ☐ **Other Actions** (Specify)

#### Guidance

Guidance may be found in ICAO Annex 8, Part II, 4.2.4.

### MNT 2.12.2

The Operator shall have a procedure for reporting to the applicable authority defects or un-airworthy conditions in accordance with requirements contained in [Table 4.4](#). **(GM)**

#### Auditor Actions

- ☐ **Identified** the process(es) for reporting defects and un-airworthy conditions to the Authority and (if applicable) Type Certificate Holder.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** personnel that execute procedures for reporting defects and un-airworthy conditions.
- ☐ **Examined** selected defects and un-airworthy condition reports to the Authority and (if applicable) Type Certificate Holder.
- ☐ **Other Actions** (Specify)

#### Guidance

The required reporting procedure would specifically identify/name the elements in points (ii), (iii) and (iv) of [Table 4.4](#) while also ensuring that a system is in place for considering additional requirements of the Authority per item (v) of [Table 4.4](#).

The intent of item (i) of [Table 4.4](#) is to ensure that the list of operator-reportable defects or un-airworthy conditions is open to the individual assessment made by the operator for occurrences outside of the 15 cases specifically identified/named in the table.



The existence of a Service Difficulty Reporting (SDR) system, established by the Authority and with which an operator is in compliance, would normally constitute an acceptable basis for conformity with this provision provided that such SDR system addresses the elements of [Table 4.4](#).

When the State of the Operator is different from the State of Registry, the operator would normally report to the airworthiness authorities of both the State of the Operator and the State of Registry.

## **MNT 2.12.3–2.12.6** (Intentionally open)

### **MNT 2.12.7**

The Operator shall have a procedure to transmit to the Design Approval Holder (DAH) information on faults, malfunctions, defects and other occurrences that could affect the continuing airworthiness of aircraft.

#### **Auditor Actions**

- ☐ **Identified/Assessed** the procedure(s) for transmitting fault/malfunction information to the Type Certificate Holder.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected fault/malfunction information reports to the Type Certificate Holder.
- ☐ **Other Actions** (Specify)

## **3 Technical Records**

### **3.1 Aircraft Maintenance Records**

#### **MNT 3.1.1**

The Operator shall have a program to ensure the following maintenance records are maintained:

- (i) Total time in service (hours, calendar time and cycles, as appropriate,) of the aircraft, engines and all life-limited components;
- (ii) Current status of compliance with all mandatory continuing airworthiness information;
- (iii) Appropriate details of modifications and repairs;
- (iv) Time in service (hours, calendar time and cycles, as appropriate,) since last overhaul of the aircraft, engines or its components subject to a mandatory overhaul life;
- (v) Current aircraft status of compliance with the Maintenance Program;
- (vi) Detailed maintenance records to show that all requirements for signing of a maintenance release have been met. **(GM)**

#### **Auditor Actions**

- ☐ **Identified/Assessed** the maintenance records program.
- ☐ **Identified** the requirements for maintenance records that must be retained.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected maintenance records (focus: specified records are retained/maintained).
- ☐ **Observed** AD/SB management (focus: records system includes current status of AD/SB compliance, individual aircraft compliance).
- ☐ **Other Actions** (Specify)

**Guidance**

Contracted maintenance organizations are normally required to maintain detailed records, to include certification documents that support the issuance of a maintenance release. Such requirement is typically specified in contractual arrangements, and implementation verified through oversight by the operator.

**MNT 3.1.2**

The Operator shall have a procedure to ensure that records specified in [MNT 3.1.1](#) are retained as follows:

- (i) Records in sub-paragraphs i) to v) are retained for a minimum period of 90 days after the aircraft, engine and component, to which they refer, has been permanently withdrawn from service;
- (ii) Records in sub-paragraph vi) are retained for a minimum period of one year after the signing of the maintenance release. **(GM)**

**Auditor Actions**

- ☐ **Identified/Assessed** the requirements and procedure(s) for retaining maintenance records.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected maintenance records (to verify the period of time records are retained).
- ☐ **Other Actions** (Specify)

**Guidance**

Item i) is applicable to aircraft that an operator has permanently taken out of service for any reason (e.g. scrapping).

**MNT 3.1.3**

The Operator shall have processes to ensure, when an aircraft becomes involved in an accident or incident, the related flight recorder records and, to the extent possible, the associated flight recorders are preserved and retained in safe custody pending disposition in accordance with the appropriate investigation.

**Auditor Actions**

- ☐ **Identified** the process(es) for custody of FDR/CVR and retention of associated records after an aircraft accident.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** personnel that execute process(es) in the event of an aircraft accident.
- ☐ **Other Actions** (Specify)

**MNT 3.1.4**

The Operator shall have processes to ensure applicable aircraft maintenance records for aircraft currently listed on the AOC:

- (i) In the event of a temporary change of operator, are made available to the new operator;
- (ii) In the event of a permanent change of operator, transferred to the new operator.

**Auditor Actions**

- ☐ **Identified/Assessed** the process(es) for the provision of maintenance records to a new operator.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Interviewed** personnel that execute process(es) for providing maintenance records to a new operator.
- ☐ **Other Actions** (Specify)



### 3.2 Aircraft Technical Log (ATL)

#### MNT 3.2.1

The Operator shall have a process to ensure all aircraft have an aircraft technical log (ATL) or approved equivalent that comprises elements specified in [Table 4.6](#).

#### Auditor Actions

- ☐ **Identified** the process(es) for management of the ATL or approved equivalent.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** a minimum of one ATL (content in accordance with specifications in [Table 4.6](#)).
- ☐ **Coordinated** with FLT auditor (verify ATL is maintained for aircraft operations).
- ☐ **Other Actions** (Specify)

#### MNT 3.2.2

The Operator shall have processes for the management of the ATL or approved equivalent as specified in [MNT 3.2.1](#) to ensure, with respect to the ATL or approved equivalent:

- (i) Entries are current and cannot be erased or deleted;
- (ii) Descriptions of errors or discrepancies that have been corrected remain readable and identifiable;
- (iii) Entries are retained to provide a continuous record of the last six months of operations.

#### Auditor Actions

- ☐ **Identified/Assessed** the process(es) for management of the ATL or approved equivalent.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** a minimum of one ATL.
- ☐ **Examined** selected ATL(s).
- ☐ **Other Actions** (Specify)

### 3.3 (Intentionally open)

### 3.4 Airworthiness Directives

#### MNT 3.4.1

The Operator shall maintain records of Airworthiness Directives (ADs) and Service Bulletins (SBs) or equivalents accomplished in accordance with the MMM.

#### Auditor Actions

- ☐ **Identified** the process(es) for maintaining records of AD and SB accomplishment.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected records of ADs and SBs that have been accomplished.
- ☐ **Observed** AD/SB management (focus: AD/SB process accomplished/recorded in accordance with MMM).
- ☐ **Other Actions** (Specify)

## 4 Maintenance Organizations

### 4.1 Approval

#### MNT 4.1.1

The Operator shall have a process to ensure an aircraft is not operated unless it is maintained and released to service by an Approved Maintenance Organization (AMO) that:

- (i) Is acceptable to the Authority;
- (ii) Has established procedures acceptable to the Authority to ensure maintenance practices are in compliance with all relevant requirements;
- (iii) Maintains the validity of its approval through compliance with the requirements for an approved maintenance organization acceptable to the Authority. **(GM)**

#### Auditor Actions

- ☐ **Identified/Assessed** the process(es) for the selection of AMOs.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Other Actions** (Specify)

#### Guidance

Refer to the IRM for the definition of [Approved Maintenance Organization \(AMO\)](#).

#### MNT 4.1.2 (Intentionally open)

#### MNT 4.1.3

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has an approval document that contains, as a minimum, the:

- (i) Name and location of the AMO;
- (ii) Date of issue and period of validity of the approval;
- (iii) Scope of the approval. **(GM)**

#### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for regulatory approval in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying mandatory information on AMO approval documents).
- ☐ **Other Actions** (Specify)

#### Guidance

The specification in item iii) of this provision is satisfied by the operator ensuring that the AMO approval document contains the type and level of work required by the operator.

A repair station or Approved Maintenance Organization certificate is usually delivered with ratings in one or more of the following categories or their equivalents:

- Aircraft;
- Avionics;
- Engine;
- Propeller;
- Structure and Corrosion Protection Control Program;
- Component;

- Welding;
- NDT.

### MNT 4.1.4 (Intentionally open)

#### MNT 4.1.5

If the Operator has maintenance performed outside the State of the Operator by a maintenance organization that does not hold an *approval* document issued by the Authority, the Operator shall have a process to ensure such maintenance organization has been *recognized* by the Authority. **(GM)**

#### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for regulatory approval in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Other Actions** (Specify)

#### Guidance

It is possible for an operator to enter into an arrangement for primary maintenance with an organization that is not an approved/accepted Maintenance Organization within the State of Registry when the arrangement is in the interest of the operator by simplifying the management of its maintenance. In such a situation, the maintenance organization is normally approved under the laws of a State that has an agreement with the State of Registry of the operator, and the operator applies its own control processes that ensure the existence of and compliance with the provisions MNT [sub-section 4](#).

## 4.2 Management

#### MNT 4.2.1

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a manager who, if applicable, is acceptable to the relevant Authority and has responsibility for the management and supervision of the maintenance organization.

#### Auditor Actions

- ☐ **Identified** the requirement criteria for management in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying responsibilities/regulatory acceptance of AMO managers).
- ☐ **Other Actions** (Specify)

#### MNT 4.2.2

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has appropriate post holders with responsibilities for ensuring the maintenance organization is in compliance with the requirements for an approved maintenance organization as accepted by the Authority. **(GM)**

#### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for the qualifications of personnel in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.

- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying qualifications/regulatory acceptance of AMO post holder personnel).
- ☐ **Other Actions** (Specify)

**Guidance**

The person or persons appointed represent the maintenance management structure of the organization and is/are responsible for all functions specified in the maintenance organization. The specified functions may be subdivided under individual managers within smaller maintenance organizations, ensuring that responsibility for all functions is allocated.

Dependent upon the extent of approval, maintenance organizations typically have, as a minimum, the following personnel: a base maintenance manager, a line maintenance manager, a workshop manager and a quality manager, all of whom report to the accountable executive, if applicable. In small maintenance organizations, subject to approval by the State of Registry/Authority, the accountable executive may also carry responsibility for other managerial positions. Deputies are normally appointed for all managerial positions, and procedures make clear who deputizes for any particular manager in the case of lengthy absence of said manager(s). The length of absence to justify deputizing is the period beyond which the organization or department cannot function properly due to such absence.

The accountable executive is responsible for ensuring that all necessary resources are available to accomplish maintenance to support the organization's maintenance organization approval.

Regardless of the size of the maintenance organization, managers appointed for the combination of the identified functions would indirectly report to the accountable executive through the base maintenance manager, line maintenance manager, workshop manager or quality manager, as appropriate.

Certifying personnel may report to any of the managers specified, depending upon which type of control the approved maintenance organization uses: licensed engineers, independent inspection or dual function supervisors. The monitoring of quality compliance remains an independent function.

**MNT 4.2.3**

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has the necessary personnel to plan, perform, supervise, inspect and release the maintenance work to be performed. **(GM)**

**Auditor Actions**

- ☐ **Identified/Assessed** the requirement criteria for human resources in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying adequacy of AMO maintenance human resources).
- ☐ **Other Actions** (Specify)

**Guidance**

The "necessary personnel" requirement addresses both the number and the (certificated) qualification/competence of the personnel. Personnel are typically employed or contracted by an AMO as acceptable to the Authority and in a proportion that ensures organizational stability. The qualification/competence of the personnel and the number of personnel are normally commensurate with the scope of approval of the AMO by the Authority. In some cases, the process put in place by an operator could require the AMO to support its "necessary personnel" status with an appropriately detailed and updated maintenance man-hour plan.

## 4.3 Quality Assurance

### MNT 4.3.1

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has an independent quality assurance program that:

- (i) Meets the specifications contained in [Table 4.7](#);
- (ii) Monitors compliance with applicable regulations, requirements and the Maintenance Procedures Manual (MPM) of the AMO;
- (iii) Addresses the specific requirements of the Operator as specified in the maintenance agreement;
- (iv) Is under the sole control of the Quality Manager or the person assigned managerial responsibility for the program. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for a QA program in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying AMO quality assurance programs meet all applicable requirements).
- ☐ **Other Actions** (Specify)

### Guidance

Refer to the IRM for the definition of [Maintenance Procedures Manual \(MPM\)](#).

The primary objectives of the quality system are to enable the AMO to ensure it can deliver a safe product and remain in compliance with all requirements.

An essential element of the quality system is the independent audit. The independent audit is an objective process of routine sample checks of *all* aspects of the approved maintenance organization's ability to carry out all maintenance to the required standards. This process typically includes:

- Product sampling, as this is the end result of the maintenance process, which represents an objective overview of the complete maintenance-related activities; product sampling is intended to complement the requirement for certifying personnel to be satisfied that all required maintenance has been properly carried out before the issue of the certificate of release to service;
- A percentage of random audits carried out on a sample basis when maintenance is being carried out; random audits include audits done during the night for those organizations that work at night.

Another essential element of the quality system is the quality feedback system. The principal function of the quality feedback system is to ensure all findings resulting from the independent quality audits of the organization are properly investigated and corrected in a timely manner:

- Independent quality audit reports are sent to the relevant department(s) for rectification action proposing target rectification dates;
- Rectification dates are discussed with such department(s) before the quality department or nominated quality auditor confirms dates in the report;
- The relevant department(s) rectifies findings within agreed rectification dates and informs the quality department or nominated quality auditor of the completion of such rectifications.

The accountable executive is kept informed of any safety issues and the extent of compliance with authority requirements. The accountable executive also holds regular meetings with personnel to check progress on rectification. In large organizations such meetings may be delegated on a day-to-day basis to the quality manager, subject to the accountable executive meeting at least twice per year with the senior personnel involved to review the overall performance and receiving at least a half yearly summary report on findings of non-compliance.

All records pertaining to the independent quality audit and the quality feedback system are retained for at least two evaluation cycles after the date of closure of the finding to which they refer, or for such period as to support changes to the audit time periods, whichever is the longer.

**Note:** *The quality feedback system may not be contracted to outside persons.*

It is not intended that this QA Program be based on a system of end product inspection, but rather upon periodic verifications of all aspects of the systems and practices used for the control of maintenance to ensure compliance with regulations and with the operator's approved procedures.

The aim of the program is to provide an unbiased picture of the AMO's performance to verify that activities comply with the MPM and confirm that the systems and procedures described in the MPM remain effective and are achieving the AMO's requirements.

## **MNT 4.3.2–4.3.4** (Intentionally open)

### **MNT 4.3.5**

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a process for periodic review of the quality assurance program by the Quality Manager or the person assigned managerial responsibility for the program for the purpose of ensuring compliance with current requirements of the Maintenance Program and the MMM.

#### **Auditor Actions**

- ☐ **Identified/Assessed** the requirement criteria for a QA program in the AMO selection and oversight process(es).
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verify AMOs conduct periodic internal review of quality assurance programs).
- ☐ **Other Actions** (Specify)

## **MNT 4.3.6** (Intentionally open)

### **MNT 4.3.7**

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a process to immediately report to the Operator any defects, un-airworthy conditions, failures or malfunctions specified in [MNT 2.12.2](#).

#### **Auditor Actions**

- ☐ **Identified/Assessed** the requirement criteria for a defect reporting in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: process to verify AMOs provide mandatory reporting of defects/conditions/failures/malfunctions).
- ☐ **Other Actions** (Specify)

## **4.4 Personnel**

### **MNT 4.4.1**

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator uses maintenance personnel:

- (i) That are appropriately licensed and/or authorized to sign the maintenance release;
- (ii) Whose competence has been established in accordance with a procedure and to a level acceptable to the authority granting approval for the maintenance organization. **(GM)**



### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for qualifications of personnel in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: process for verifying AMO personnel are licensed/authorized to sign maintenance release).
- ☐ **Observed** aircraft part/component installation/replacement (focus: personnel signing maintenance release are appropriately licensed/authorized).
- ☐ **Observed** line maintenance operations (focus: personnel signing maintenance release are appropriately licensed/authorized).
- ☐ **Other Actions** (Specify)

### Guidance

Licensing typically ensures maintenance personnel have met the basic requirements of an applicable authority in terms of age, knowledge, experience and, if required, medical fitness and skill, and have demonstrated the required knowledge and skill in a manner specified by the authority.

Planners, mechanics, specialized services personnel, supervisors and certifying personnel are typically assessed for competence by an on-the-job evaluation and/or examination relevant to their particular job or role within the organization before unsupervised work is permitted.

To assist in the assessment of competence, job descriptions are recommended for each job role in the organization. Basically, the assessment establishes that:

- Planners are able to interpret maintenance requirements into maintenance tasks and have an appreciation that they have no authority to deviate from the maintenance data;
- Mechanics are able to carry out maintenance tasks to any standard specified in the maintenance data and notify supervisors of mistakes requiring rectification to meet required maintenance standards;
- Specialized services personnel are able to carry out specialized maintenance tasks to the standard specified in the maintenance data and will both inform and await instructions from their supervisor in any case where it is impossible to complete the specialized maintenance in accordance with the maintenance data;
- Supervisors are able to ensure that all required maintenance tasks are carried out and where not completed or where it is evident that a particular maintenance task cannot be carried out in accordance with the maintenance data, it is to be reported to the responsible person for appropriate action. In addition, for those supervisors who also carry out maintenance tasks, that they understand such tasks are not to be undertaken when incompatible with their management responsibilities;
- Certifying personnel are able to determine when the aircraft is or is not ready to be released to service.

Knowledge of organizational procedures relevant to each individual's particular role in the organization is important, particularly in the case of planners, specialized services personnel, supervisors and certifying personnel.

### MNT 4.4.2

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a means for providing a positive identification of maintenance personnel that are approved to perform and certify maintenance. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** requirement for identification of personnel approved to perform/certify maintenance in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).

- ❑ **Examined** AMO selection records (focus: process for identifying personnel approved to perform/certify maintenance).
- ❑ **Examined** selected AMO oversight/monitoring reports (focus: identification of personnel approved to perform/certify maintenance).
- ❑ **Observed** aircraft part/component installation/replacement (focus: personnel are approved to perform/certify maintenance).
- ❑ **Observed** line maintenance operations (focus: personnel are approved to perform/certify maintenance).
- ❑ **Other Actions** (Specify)

## Guidance

A database, signature roster or other equivalent mechanisms are typically used to identify such personnel.

## 4.5 Training Program

### MNT 4.5.1

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a training program that requires all maintenance personnel to receive initial and recurrent training that is appropriate to individually assigned tasks and responsibilities, and provides maintenance personnel with the:

- (i) Knowledge of regulations, standards and procedures in accordance with requirements in the MMM;
- (ii) Knowledge and skills related to human performance, including coordination with, as applicable, other maintenance personnel and/or flight crew. **(GM)**

## Auditor Actions

- ❑ **Identified/Assessed** the requirement criteria for an overall training program in the AMO selection process.
- ❑ **Interviewed** responsible manager(s).
- ❑ **Examined** selected AMO selection records.
- ❑ **Examined** selected AMO oversight/monitoring reports (focus: verifying AMOs have initial/recurrent training programs for maintenance personnel).
- ❑ **Observed** line maintenance operations (focus: personnel signing maintenance release receive initial and recurrent training that are appropriate to individually assigned tasks and responsibilities).
- ❑ **Other Actions** (Specify)

## Guidance

Refer to the IRM for the definitions of [Human Factors Principles](#) and [Human Performance](#).

The intent of this provision is for the operator to ensure appropriate initial and recurrent training for maintenance personnel and to ensure such training takes into account the knowledge and skills specified.

Maintenance personnel receive training in human performance to promote an understanding of the human factors (e.g. human capabilities, limitations, and the interface(s) between human and system components) involved in performing maintenance duties and coordinating with other maintenance personnel and/or flight crew. These human factors are taken into account during training to reduce human error in maintenance activities, including activities performed by an external AMO.

### MNT 4.5.2–4.5.3 (Intentionally open)

### MNT 4.5.4

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a training program that provides for continuation training on an

interval not to exceed 36 months, which may be reduced to a lesser interval based on findings generated by the QA Program. **(GM)**

### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for continuation training of personnel in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying AMOs have program for continuation training at maximum 36-month interval).
- ☐ **Other Actions** (Specify)

### Guidance

Continuation training is a two-way process to ensure that relevant maintenance personnel remain current in terms of procedures, human factors and technical knowledge, and that the approved maintenance organization receives feedback on the adequacy of its procedures and maintenance instructions. Due to the interactive nature of this training, consideration would be given to the possibility that such training has the involvement of the quality department to ensure feedback is actioned. Alternatively, there is a procedure to ensure that feedback is formally passed from the training department to the quality department to initiate action.

Continuation training would cover changes in relevant State of Registry/Authority requirements, changes in organization procedures and the modification standard of the products being maintained plus human factor issues identified from any internal or external analysis of incidents. It would also address instances where personnel failed to follow procedures and the reasons why particular procedures are not always followed. In many cases, the continuation training reinforces the need to follow procedures and ensure that incomplete or incorrect procedures are identified so they can be corrected. This does not preclude the possible need to carry out a quality audit of such procedures.

The program for continuation training lists all relevant maintenance personnel and when training will take place, the elements of such training and an indication it was carried out reasonably on time as planned. Such information is subsequently transferred to the certifying personnel record.

The referenced procedure is specified in the MPM.

Continuation training requirements are intended to apply to personnel performing and certifying maintenance, as well as to planners, inspectors of incoming goods and other maintenance personnel that have safety-critical responsibilities.

Refer to the Guidance associated with [MNT 1.3.2](#) for information that explains and addresses human factors principles.

### MNT 4.5.5

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a training and qualification program for auditors used in the QA Program.

### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for the training of QA auditors in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying AMOs have training/qualification program for quality assurance auditors).
- ☐ **Other Actions** (Specify)

## MNT 4.5.6

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a training program that provides for initial and continuation training for receiving inspectors.

### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for the training of receiving inspectors in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying AMOs have initial/recurrent training program for receiving inspectors).
- ☐ **Other Actions** (Specify)

## MNT 4.5.7

If the Operator uses a maintenance organization that has maintenance personnel taxi the Operator's aircraft on the movement area of an airport, the Operator shall have a process to ensure such maintenance personnel are authorized, competent and qualified to conduct aircraft taxi operations.

### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for the qualifications of personnel that taxi aircraft in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying training/qualification of AMO personnel authorized to taxi aircraft, if applicable).
- ☐ **Other Actions** (Specify)

## 4.6 Facilities and Physical Resources

### MNT 4.6.1

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has the basic facilities and work environment, appropriate for the maintenance tasks to be performed for the Operator, to include:

- (i) A place of business, with a fixed address;
- (ii) Communications equipment/software, such as telephones, facsimile machines, email and others;
- (iii) Any devices used to establish when a particular aircraft requires maintenance. This may include planning bulletin boards, card files or a computer system;
- (iv) A secure, dry storage area to retain aircraft technical records. **(GM)**

### Auditor Actions

- ☐ **Observed/Assessed** facilities/equipment/storage/work environment.
- ☐ **Examined** selected AMO oversight/monitoring reports. (focus: verifying adequate AMO facilities/work environment to perform maintenance).
- ☐ **Interviewed** MNT operations manager and/or designated management representative(s).
- ☐ **Other Actions** (Specify)

### Guidance

For base maintenance of aircraft, aircraft hangars or equivalent facilities are available, large enough to accommodate aircraft on planned base maintenance. If the maintenance organization does not own the hangar, it may be necessary to establish proof of tenancy. In addition, sufficient hangar space to carry out planned base maintenance will need to be demonstrated by the preparation of a



projected aircraft hangar visit plan, relative to the maintenance program. The aircraft hangar visit plan is updated on a regular basis. For aircraft component maintenance, aircraft component workshops are large enough to accommodate the components on planned maintenance.

Aircraft hangar and aircraft component workshop structures would need to be to a standard that prevents the ingress of rain, hail, ice, snow, wind and dust, and aircraft hangar and aircraft component workshop floors are sealed to minimize dust generation. Basically, the aircraft hangar and aircraft component workshop provide protection from the normal prevailing local weather elements that are expected throughout any 12-month period.

For line maintenance of aircraft, hangars are not essential but access to hangar accommodation is necessary during inclement weather for minor scheduled work and lengthy defect rectification.

Office accommodation allows incumbents, whether they are management, planning, technical records, quality or certifying personnel, to carry out their designated tasks in a manner that contributes to good aircraft maintenance standards. In addition, aircraft maintenance personnel are provided with an area where they may study maintenance instructions and complete maintenance records in a proper manner.

**Note:** *It is acceptable to combine any or all of the above requirements into one office subject to the personnel having sufficient room to carry out assigned tasks.*

Hangars used to house aircraft together with office accommodation would be such that the working environment permits personnel to carry out work tasks in an effective manner.

Temperatures are such that personnel can carry out required tasks without undue discomfort.

Dust and any other airborne contamination are kept to a minimum and not be permitted to reach a level in the work task area where visible aircraft/component surface contamination is evident.

An adequate level of lighting ensures each inspection and maintenance task can be carried out.

Noise levels are not permitted to rise to the point of distracting personnel from carrying out inspection tasks. Where it is impractical to control the noise source, such personnel would be provided with the necessary personal equipment to stop excessive noise causing distraction during inspection tasks.

Where a particular maintenance task requires the application of specific environmental conditions different to the foregoing, then such conditions would be observed. Such specific conditions are identified in the approved maintenance instructions.

The working environment for line maintenance is such that the particular maintenance or inspection task can be carried out without undue distraction. If the working environment deteriorates to an unacceptable level due to temperature, moisture, hail, ice, snow, wind, light, dust or other airborne contamination, then the particular maintenance or inspection tasks is suspended until satisfactory conditions are re-established.

For both base and line maintenance where dust or other airborne contamination results in visible surface contamination, all susceptible systems are sealed until acceptable conditions are re-established.

### **MNT 4.6.2**

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has the necessary technical data, equipment, tools and material to perform the work for which the maintenance organization has been approved, to include:

- (i) Equipment and tools necessary to comply with the work specified in the agreement between the Operator and the maintenance organization;
- (ii) Sufficient supplies and spare parts to ensure timely rectification of defects with regard to the Minimum Equipment List (MEL) provisions as specified in the agreement between the Operator and the maintenance organization. **(GM)**

### **Auditor Actions**

- ☐ **Identified/Assessed** the requirement criteria for technical data, equipment, tools and material in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.

- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying adequacy of AMO data/equipment/supplies/parts to perform maintenance).
- ☐ **Observed** aircraft part/component installation/replacement (focus: availability/use of necessary technical data/equipment/tools/material for maintenance activity being performed).
- ☐ **Observed** line maintenance operations (focus: availability/use of necessary technical data/equipment/tools/material for maintenance activity being performed).
- ☐ **Observed** aircraft parts/components management/handling (focus: availability/use of necessary technical data/equipment/tools/material for management/handling of aircraft parts/components).
- ☐ **Other Actions** (Specify)

#### Guidance

Tools and equipment, as specified in the Approved Data, can be made available when needed. Tools and equipment, which require to be controlled in terms of servicing or calibration to measure specified dimensions and torque figures, are to be clearly identified and listed in a control register, including any personal tools and equipment that the organization agrees can be used. Where the manufacturer specifies a particular tool or equipment, then that tool or equipment is used, unless the AMO has an approved procedure to determine the equivalency of alternative tooling/equipment and the procedure documented in the MPM.

The availability of equipment and tools indicates permanent availability except in the case of any tool or equipment that is so rarely needed that its permanent availability is not necessary.

A maintenance organization approved for base maintenance has sufficient aircraft access equipment and inspection platforms/docking such that the aircraft may be properly inspected.

The supplies necessary to perform maintenance work refer to readily available raw material and aircraft components, in accordance with the manufacturer's recommendations, unless the organization has an established spares provisioning procedure.

#### MNT 4.6.3

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has facilities suitable for the storage of parts, equipment, tools and material under conditions that provide security and prevent deterioration of and damage to stored items. Such processes shall ensure:

- (i) Clean work areas, including management offices;
- (ii) Parts and material properly identified and stored;
- (iii) Oxygen and other high-pressure bottles properly identified and stored;
- (iv) Flammable, toxic or volatile materials properly identified and stored;
- (v) Equipment identified and protected. **(GM)**

#### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for facilities in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying adequate AMO storage facilities for parts/tools/equipment/material).
- ☐ **Observed** aircraft parts/components management/handling (focus: adequate storage facilities for aircraft parts/components).
- ☐ **Other Actions** (Specify)

#### Guidance

Storage facilities for serviceable aircraft components are clean, well-ventilated and maintained at an even dry temperature to minimize the effects of condensation. Storage recommendations from the manufacturers for aircraft components are to be followed.



Storage racks are strong enough to hold aircraft components and provide sufficient support for large aircraft components such that the component is not distorted during storage.

All aircraft components, wherever practicable, remain packaged in protective material to minimize damage and corrosion during storage.

### MNT 4.6.4

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a shelf-life program for applicable items, which includes a requirement for the shelf-life limit to be controlled and displayed.

#### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for a shelf life program in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying acceptable AMO shelf-life program for applicable stored items).
- ☐ **Observed** aircraft parts/components management/handling (focus: shelf-life program for applicable stored aircraft parts/components).
- ☐ **Other Actions** (Specify)

### MNT 4.6.5

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a receiving inspection program that:

- (i) Assures incoming material has the required certification documentation and traceability;
- (ii) Includes a process for verification of incoming part tags to ensure information on the tag (e.g. part name, part number, serial number, modification and/or any other applicable reference information) matches the corresponding information on the part.

#### Auditor Actions

- ☐ **Identified/Assessed** the receiving inspection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected records of incoming material (focus: certification documentation and traceability).
- ☐ **Examined** selected records of verification of incoming part tags.
- ☐ **Examined** selected AMO oversight/monitoring reports. (focus: verifying acceptable AMO receiving inspection programs).
- ☐ **Observed** aircraft parts/components management/handling (focus: program for ensuring receiving inspection of incoming aircraft parts/components).
- ☐ **Other Actions** (Specify)

## 4.7 Material Handling

### MNT 4.7.1

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a secure quarantine area for rejected parts and materials awaiting disposition.

#### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for a secure parts/materials quarantine area in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.

- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying adequate AMO parts/materials quarantine area).
- ☐ **Observed** aircraft parts/components management/handling (focus: secure quarantine area(s) adequate for rejected aircraft parts/components).
- ☐ **Other Actions** (Specify)

## MNT 4.7.2

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a process for segregating aircraft serviceable parts, aircraft non-serviceable parts, and non-aircraft parts.

### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for a parts segregation process in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying acceptable AMO process for segregating parts).
- ☐ **Observed** segregated parts.
- ☐ **Observed** aircraft parts/components management/handling (focus: process for segregating serviceable/non-serviceable/non-aircraft parts/components).
- ☐ **Other Actions** (Specify)

## MNT 4.7.3

The Operator shall have a process to ensure each maintenance organization that handles, or performs maintenance on, electrostatic sensitive devices (ESD) for the Operator has an ESD Program. Such ESD program shall comply with applicable manufacturer instructions and the specifications contained in [Table 4.8](#). (GM)

### Auditor Actions

- ☐ **Identified** the requirement criteria for an ESD program in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying acceptable AMO ESD program).
- ☐ **Observed** aircraft parts/components management/handling (focus: ESD program in accordance with [Table 4.8](#)).
- ☐ **Other Actions** (Specify)

### Guidance

Consideration is typically given to the scope of work of the maintenance organization in determining the applicability of ESD requirements.

## MNT 4.7.4

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a method of storage that assures sensitive parts and equipment, such as, but not limited to, oxygen system components (oxygen generators and bottles), O-rings and electrostatic sensitive devices are properly packaged, identified and stored to protect them from damage and contamination. (GM)

### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for the storage of sensitive parts in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).

- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying acceptable AMO methods for storage of sensitive parts/equipment).
- ☐ **Observed** aircraft parts/components management/handling (focus: methods for ensuring proper identification/storage of sensitive aircraft parts/components).
- ☐ **Other Actions** (Specify)

## Guidance

The intent of this provision is to ensure maintenance organizations comply with storage recommendations from the manufacturers, with particular emphasis on recommendations with respect to temperature and humidity.

Consideration is to be given to the scope of work of the AMO in determining applicability of specific handling and/or storage requirements.

### MNT 4.7.5

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a process that assures aircraft components and parts are shipped in suitable containers that provide protection from damage and, when specified by the OEM, ATA-300 or equivalent containers shall be used.

## Auditor Actions

- ☐ **Identified** the requirement criteria for the shipping of aircraft components and parts in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying acceptable AMO methods/containers for shipping aircraft components/parts).
- ☐ **Observed** aircraft parts/components management/handling (focus: process for ensuring aircraft parts/components are shipped in suitable containers).
- ☐ **Other Actions** (Specify)

## 4.8 (Intentionally open)

## 4.9 Procedures Manual

### MNT 4.9.1

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator provides for the use and guidance of relevant maintenance personnel a Maintenance Procedures Manual (MPM), which may be issued in separate parts, that contains information, as specified in [Table 4.9](#). **(GM)**

## Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for an MPM in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying acceptable AMO MPM in accordance with [Table 4.9](#)).
- ☐ **Examined** MPM (if available).
- ☐ **Other Actions** (Specify)

## Guidance

The MPM is a document that defines how an Approved Maintenance Organization accomplishes and controls its aircraft maintenance activities.

The MPM provides all personnel of the AMO with the necessary information to enable them to accomplish their duties and allows the Authority to understand and approve how the AMO complies with the applicable Airworthiness Requirements.

The MPM can comprise one manual or a suite of manuals. The MPM may have specific sections extracted to form a customized manual for distribution to maintenance contractors, line stations and others as applicable.

The purpose of the MPM is to set forth the procedures, means and methods for the AMO to accomplish maintenance. Compliance with its contents assures fulfillment of the AMO's responsibilities.

The management section in the MPM may be produced as a stand-alone document and made available to the key personnel who need to be familiar with its contents.

The list of AMO Certifying Personnel may be produced as a separate document.

Responsibilities and procedures for revisions to the management part of the MPM and any associated manuals are to be specified.

The Quality Manager of the AMO is responsible for monitoring revisions of the MPM, unless otherwise agreed by the Authority.

Unless the Authority has agreed via a procedure stated in the amendment section of the MPM that certain defined classes of amendments may be incorporated without prior Authority approval, this process would typically include monitoring revisions to the associated procedures manuals.

The MPM also normally contains the following information:

- A brief description of the organization that includes:
  - The approximate size of the organization;
  - The geographic location of the office facilities and/or the base of operations, when not co-located;
  - Where necessary to ensure comprehension, a chart depicting the distribution of the functions.
- A statement signed by the maintenance organization confirming the MPM and any incorporated documents identified therein reflect the Organization's means of compliance with the Authority requirements;
- A description of the maintenance procedures and the procedures for completing and signing a maintenance release when maintenance is based on a system other than that of an approved maintenance organization;
- A description of the procedures for monitoring, assessing and reporting maintenance and operational experience;
- A description of procedures for assessing continuing airworthiness information and implementing any resulting actions;
- A description of the procedures for implementing action resulting from mandatory continuing airworthiness information;
- A description of procedures for ensuring that unserviceable items affecting airworthiness are recorded and rectified;
- A description of the procedures for advising the State of Registry/Authority/operator of significant in-service occurrences;
- A table of contents;
- A description of the MPM amendment control procedure;
- A means of identifying each page of the MPM. This can be in the form of a list of effective pages, with each page numbered and either dated or marked with a revision number;
- A description of the system used to distribute the MPM, including a distribution list; for non-scheduled work, temporary copies of the relevant portions of the MPM or any incorporated reference;

- Where the organization uses standards for the performance of elementary work or servicing different from those recommended by the manufacturer, the identification of those standards;
- Procedures to ensure regulatory information and technical data appropriate to the work performed are used in respect of elementary work and servicing;
- Details of the methods used to record the maintenance, elementary work or servicing performed, including the method of recording of defects in the technical record required by these standards;
- A detailed description of the procedures used to ensure that any maintenance tasks required by the maintenance schedule, airworthiness directives or any task required for the rectification of a defect are completed within the required time constraints;
- A description of the evaluation program required by these standards;
- A description of the defect rectification and control procedures, including details of:
  - The methods used to detect and report recurring defects;
  - The procedures for scheduling the rectification of defects whose repair has been deferred.
- The procedures used to report service difficulties in accordance with these standards;
- A description of the technical dispatch procedures, including procedures for ferry-flight authorizations, EDTO (equivalent terms: ETOPS, EROPS, LROPS), all-weather operation or any other special operation;
- Procedures to ensure that only parts and materials that meet the requirements of the State of Registry/Authority/operator are used in the performance of elementary work or servicing, including details of any spare part pool arrangements that have been entered into;
- A description of the methods used to ensure that the personnel authorized to perform elementary work or servicing are trained as required by the Authority and qualified in accordance with these requirements, as applicable;
- A description of personnel records to be retained;
- Details of the procedures applicable to maintenance arrangements and a list of all such arrangements, including the procedure used to communicate to an approved maintenance organization the maintenance requirements for planned and unforeseen maintenance activities, as well as those mandated by airworthiness directives;
- Procedure for revising and maintaining the MPM up to date and current;
- Approval of the Authority through approval of the list of effective pages or, in the case of manuals containing a small number of pages, approval can be identified on each page;
- Procedures used for the storage and control of petroleum, oil and other lubricants, as required by national regulations.

### MNT 4.9.2

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a process to amend the MPM as necessary to keep the information contained therein up to date.

#### Auditor Actions

- ☐ **Identified/Assessed** the requirement criteria for an MPM amendment process in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports. (focus: process for verifying acceptable AMO MPM amendment process).
- ☐ **Examined** MPM for currency (if available).
- ☐ **Other Actions** (Specify)

**MNT 4.9.3**

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has a process to furnish copies of all amendments to the MPM promptly to all organizations or persons to whom the manual has been issued.

**Auditor Actions**

- ☐ **Identified/Assessed** the requirement criteria for an MPM distribution process in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: process for verifying acceptable AMO MPM distribution/dissemination processes).
- ☐ **Other Actions** (Specify)

**4.10 Maintenance Release****MNT 4.10.1**

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator produces a completed and signed maintenance release that certifies all maintenance work performed has been completed satisfactorily and in accordance with the approved data and procedures described in the MPM of the maintenance organization. Such maintenance release shall include:

- (i) Basic details of the maintenance performed;
- (ii) A reference of the approved data used and, if required, the revision status;
- (iii) Maintenance tasks that were not accomplished;
- (iv) The date maintenance was completed;
- (v) When applicable, identity of the approved maintenance organization;
- (vi) Identity of the person(s) that sign the release. **(GM)**

**Auditor Actions**

- ☐ **Identified** the requirement criteria for the production of the maintenance release in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: verifying AMO production of completed/signed maintenance release that certifies maintenance performed in accordance with MPM).
- ☐ **Observed** line maintenance operations (focus: production of complete maintenance release for specific maintenance activity being performed).
- ☐ **Observed** aircraft part/component installation/replacement (focus: production of complete maintenance release for specific maintenance activity being performed).
- ☐ **Other Actions** (Specify)

**Guidance**

Refer to the IRM for the definition of [Maintenance Organization Exposition](#).

An operator has the option of defining when the revision status of approved data (that was used during the performance of maintenance) must be included in the maintenance release. The process that defines such requirement is typically documented in the operator's MMM.

A requirement for the documented revision status to be part of the maintenance release might depend on the particular approved data that is referenced. For example, if the Aircraft Maintenance Manual that was used for maintenance is distributed online, there would be an online record of the revision that was available at the time of maintenance, which might obviate the need for that



information to be documented in the maintenance release. Conversely, the revision status of certain engineering documents and/or drawings might not be found online or be otherwise available, in which case the operator could opt to require the revision status to be included in the maintenance release for the purpose of ensuring traceability.

## *Aircraft CRS*

A Certificate of Release to Service (CRS) is required before flight:

- At the completion of any maintenance package specified by the aircraft operator;
- At the completion of any defect rectification, while the aircraft operates flight services between scheduled maintenance.

The maintenance package may include any one or a combination of the following elements: a check or inspection from the operator's aircraft maintenance program, Airworthiness Directives, overhauls, repairs, modifications, aircraft component replacements and defect rectification.

New defects or incomplete maintenance work orders identified during maintenance are brought to the attention of the operator for the specific purpose of obtaining agreement to rectify such defects or complete the missing elements of the maintenance work order. In the case where the aircraft operator declines to have such maintenance carried out and provided this missing element/defect does not affect the airworthiness of the aircraft, this fact is entered in the aircraft CRS before issue of such certificate.

## *Component CRS*

A CRS is necessary at the completion of any maintenance on an aircraft component while off the aircraft.

The authorized release certificate/airworthiness approval tag constitutes the aircraft component certificate of release to service when one AMO maintains an aircraft component for another AMO.

When an AMO maintains an aircraft component for use by the organization, an authorized release certificate/airworthiness approval tag may or may not be necessary, depending upon the organization's internal release procedures defined in the maintenance organization exposition and approved by the Authority.

## 4.11 Tooling and Calibration

### **MNT 4.11.1**

The Operator shall have a process to ensure each maintenance organization that performs maintenance for the Operator has procedures to control and document the calibration and records of all tools, including personnel-owned tools, and preventing out-of-service and due-for-calibration tools and equipment from being used, in accordance with specifications in [Table 4.10. \(GM\)](#)

### **Auditor Actions**

- ☐ **Identified/Assessed** the requirement criteria for the tool calibration in the AMO selection process.
- ☐ **Interviewed** responsible manager(s).
- ☐ **Examined** selected AMO selection records.
- ☐ **Examined** selected AMO oversight/monitoring reports (focus: process for verifying acceptable AMO tool calibration program).
- ☐ **Observed** line maintenance operations (focus: proper calibration of tools used in maintenance activity being performed).
- ☐ **Observed** aircraft part/component installation/replacement (focus: proper calibration of tools used in maintenance activity being performed).
- ☐ **Other Actions** (Specify)



## Guidance

The control of these tools and equipment requires that the organization has a procedure to inspect/service and, where appropriate, calibrate such items on a regular basis and indicate to users that the item is within any inspection or service or calibration time limit. A clear system of labeling of all tooling, equipment and test equipment is therefore necessary, providing information on:

- When the next inspection or service or calibration is due;
- Whether the item is serviceable or unserviceable and the reason for its unserviceability.

A register is maintained for all precision tooling and equipment together with a record of calibrations and standards used.

Inspection, service or calibration of tools and equipment on a regular basis is in accordance with the equipment manufacturer's instructions except where the maintenance organization can justify by means of results that a different time period is appropriate in a particular case.

The procedural approach complies with the applicable standards authority (e.g. US Bureau of Standards or a country's approved standards certificate from the testing facility).