CIVIL AVIATION AUTHORITY
OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

Advisory Circular
AC145-1

Revision 8

Aircraft Maintenance Organisations

6 September 2023

General

Civil Aviation Authority (CAA) advisory circulars (ACs) contain information about standards, practices, and procedures that the Director has found to be an acceptable means of compliance with the associated rule.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate AC.

Purpose

This AC describes an acceptable means of compliance for obtaining certification under Part 145 for the purpose of conducting maintenance of specific aircraft or aircraft components.

Related Rules

This AC relates specifically to Civil Aviation Rule Part 145 *Aircraft Maintenance Organisations—Certification.*

Change Notice

Revision 8 removes references to Part 141 throughout the document and provides additional detail on the authorisation of staff who maintain components. Minor changes have also been incorporated to highlight the significance of ATA Specification 104 (now at Revision 2022.1).

Lastly, an error has been fixed in the section on rule 145.63, *Records*, *Operator's records*, correcting the time that records need to be retained from one year to five years, in accordance with the relevant rule.

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Version History

History Log

Revision No.	Effective Date	Summary of Changes
AC145-01, Rev 0	17 Aug 1994	Initial issue of this AC
AC145-1A	25 Dec 1997	Changes not specified
AC145-1, Rev 1A	21 Jan 2005	Amended and corrected two wording errors in 145.60
AC145-1, Rev 3	27 Apr 2007	Re-numbered this AC from AC 145-1A to AC 145-1 as part of a project to standardise numbering of all ACs.
AC145-1, Rev 4	24 July 2007	Corrected various references to other ACs which have now been re-numbered.
AC145-1, Rev 5	1 May 2015	General revision. Incorporated recent rule amendments to Part 145, the introduction of Part 115 and advisory material for the inclusion of Safety Management System (SMS) within the organisation exposition.
AC145-1, Rev 5.1	9 Apr 2021	Incorporated amendments to Part 145, the introduction of Part 115 and advisory material for the inclusion of Safety Management System (SMS) within organisation exposition. Removed section that conflicts with Civil Aviation Rules.
AC145-1, Rev 6	17 Jun 2022	Updated guidance to reflect the change from a QMS to an SMS focus. Made changes throughout to reflect the update of rule 145.65 to being about the need for an SMS. Updated references to AC 100-1, *Safety Management*. Made stylistic changes and corrected typos and other minor errors throughout. Substituted guidance on quality management with reference to AC100-1. Took the opportunity to add a Version History.
AC145-1, Rev 7	4 Nov 2022	Minor change to Appendix A, *Organisation Exposition*, changing terminology from “compliance matrix” to “rules checklist” to reflect a recent forms refresh.
AC145-1, Rev 8	6 Sept 2023	Removes references to Part 141 throughout the document and adds a recommendation that ATA

		Specification 104 be read in conjunction with this AC when establishing training requirements. Incorporates minor changes incorporated to highlight the significance of ATA Specification 104 (now at Revision 2022.1). Fixes an error in the section on rule 145.63, *Records*, *Operator's records*, correcting the time that records need to be retained from one year to five years, in accordance with the relevant rule.

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Subpart A – General

Note: *To assist readers with cross-referencing, the numbering of the paragraphs contained within this AC corresponds with specific rules in Part 145.*

145.1 Applicability

Part 145 applies to organisations seeking certification as aircraft maintenance organisations (AMOs). Organisations will only be certificated if the service they provide requires them to be certificated, such as if they provide maintenance services to a New Zealand operator or organisation.

145.5 Requirement for certificate

A Part 145 certificate is required when conducting the activities specified in rule 43.54. Aircraft that are smaller than those in rule 43.54(a) may be maintained by an organisation certificated under Part 145 and are provided for under the A4 rating.

The specific privileges of the Part 145 certificate holder are detailed under rule 145.11 see below.

145.7 Application for certificate

This rule prescribes the form to be used by an applicant for the grant of a maintenance organisation certificate. A New Zealand address is required for applicants based outside New Zealand; this may be the address of a solicitor or an authorised agent.

The applicant should provide the information required by form CAA 24145/01. The form can be downloaded from the CAA website, www.caa.govt.nz, under "Forms" in the "A to Z" list.

It is important that all forms and the Part 145 matrix (24145-02), which is also available in the Forms section, are completed correctly as this will save time when processing the application.

145.9 Issue of certificate

There are several requirements to be met for the issue of the certificate. Primarily, the applicant must meet the requirements of Part 145 Subpart B to be issued a certificate. A copy of the CAA's *Certification Policy - Organisations* is available on the CAA website at this link.

To be assessed as meeting the requirements of Subpart B the applicant's documentation will be checked for compliance with the rules and suitability for the type of maintenance tasks the applicant is proposing to perform.

After the documentation is accepted as satisfactory, CAA will carry out an inspection of the applicant's facilities and resources, including interviews with nominated senior persons. This initial comprehensive inspection will ensure that the organisation can comply with their exposition and that the exposition accurately reflects the organisation's activities. Once the Director is satisfied that all certification requirements have been completed in a satisfactory manner, the certificate is issued.

145.11 Privileges of certificate holder

The certificate is issued with ratings reflecting the categories of maintenance the organisation is considered competent to perform.

While the certificate ratings are general, the detailed capability of an organisation should be stated in their exposition. This detailed capability will largely be dependent on the facilities the organisation

has access to, and the experience and qualifications of the personnel the organisation employs. An applicant should not detail activities the organisation will not be able to provide.

Does the organisation require an Aircraft (A) rating or a Component (C) rating?

If a component is removed from an aircraft, has maintenance performed on it in accordance with acceptable data and is re-installed on the same aircraft; then, provided that the maintenance is within the capability of the Part 145 Aircraft Maintenance Organisations Certification (AMO), it can be released to service under the privileges of the organisation's A rating.

If a component is removed from an aircraft (or stock), has maintenance performed and then is put into stock or onto a different aircraft; then the work should be performed under a C rating.

The scope of work that can be performed under the C rating is detailed within the capability list and will take into account the following aspects:

- Facilities
- Data
- Tooling
- Equipment
- Trained and authorised personnel.

The scope should also describe the extent of work that may be performed and may be limited by specific reference to the Aircraft Maintenance Manual (AMM) or Component Maintenance Manual (CMM) as appropriate.

Additional limitations on certificate

The Director may place limitations and conditions on an AMO certificate. These additional limitations may include, but are not limited to, models from a Type Certificate, limitations based on the applicable requirements of Parts 43 and 66, or general qualifications of the maintenance activities considered appropriate.

145.13 Duration of certificate

The initial certificate can be issued for up to five years, but the maximum duration isn't always granted. The length of the initial certificate will be decided on a case-by-case basis.

Certificates that expire, are suspended, or are revoked, must be returned to CAA. Certificates should be returned to the Director at the 'Contact Us' address on the CAA website within seven days of their ceasing to be effective.

145.15 Notification of ceasing maintenance

If an organisation decides to cease maintenance services, they are required to notify CAA in writing and request revocation of the certificate within 30 days of the date of cessation.

As well as ensuring CAA has an accurate picture of the AMO within New Zealand and overseas, there are continuing airworthiness responsibilities that must be addressed when an AMO ceases to operate. It is also important that the organisation notifies any air operators they are contracted to~~,~~ as those air operators will need to make changes within their operation to maintain compliance under the operating rule.

Note: *Aviation documents are not transferable, as per rule 19.11. An organisation's certificate is issued against the entity (for example the number registered with the Companies Office). Should the organisation be taken over, resulting in a change to the legal entity, the certificate cannot be transferred to the new organisation, so it expires when ownership changes. Persons engaging in the sale or purchase of such an organisation should contact CAA to understand the implications for the business.*

145.17 Renewal of certificate

An organisation should allow sufficient time for the CAA renewal process to be planned and carried out. The time involved will vary according to the type of maintenance activity the organisation is certificated for, as well as the period the certification has been in force.

Where a certificate has been in force for five years, a re-entry application and compliance assessment process will be required. This process will ensure that the organisation complies with all relevant rules. The scope of the re-entry assessment process will be determined by the organisation's conduct to date, any changed circumstances, review of senior persons, and results of safety audit findings over the period of validity.

Applications for renewals should be made before the current certificate expires, as early applications may prevent any issues arising delaying the issue of the certificate.

Organisations are encouraged to make the renewal application at least 60 days prior to the expiry date. At the very latest, applications should be made:

- at least 30 days prior to the expiry date, or
- by the date shown in the 'Limitations and Conditions' section of the Exposition Acceptance document

whichever occurs earliest.

The renewal of an AMO certificate may be delayed if the organisation's application is not forwarded by the appropriate date or is incomplete.

Note: *CAA actively seeks applications for renewal well in advance of 30 days, to mitigate the risk that there will not be sufficient time to prepare for recertification tasks and effect a seamless (unbroken) transition from the old to the new certificate. Note that CAA may add a condition to an organisation's (particularly larger organisations) Exposition Acceptance document, requiring any application for renewal to be submitted by a specified date.*

Subpart B – Certification Requirements

145.51 Personnel requirements

One basis for certification will be an adequate staffing structure from the chief executive's (CE's) position to the maintenance personnel. Individuals undertaking one or more functions in the organisation should have a clear understanding of the division of responsibilities and be able to demonstrate this to CAA.

The organisation must be able to show that it has enough authorised personnel to ensure that all maintenance activities are performed in accordance with acceptable methods, techniques and practices.

The organisation should provide for the initial assessment and maintenance of the levels of competency of all personnel involved in planning, supervision, inspection / performing certification and safety management of any maintenance activity listed in the applicant's exposition.

The International Civil Aviation Organisation (ICAO) defines competence as a combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

The competence of all staff should be determined on the basis of:

- academic qualifications
- licences, certificates or approvals held
- employment records, showing experience relevant to the role, and/ or
- written, oral, or practical examination.

The chief executive (CE)

The CE must have:

- the authority within the organisation to ensure activities are performed in accordance with applicable requirements
- the authority within the organisation to ensure appropriate actions are taken to address safety issues and risks, and respond to accidents and incidents, and
- the financial responsibility and resources to support this.

If an organisation has several independent business units then it may be appropriate to apply for certification independently for each of them. If this is the case, the organisation will need to identify a CE for the maintenance unit specifically.

If, on the other hand, an organisation retains one identity, the CE should be clearly shown to have an appropriate level of authority. This may occur where an organisation is certificated for other tasks such as air operations, supply, manufacture, design or training and only one core exposition is used for all administrative functions.

The senior persons

The person or persons nominated will represent the management structure of the organisation and must be acceptable to the Director. Titles may vary between organisations, but there must be management representatives for the control and direction of maintenance activities, personnel

authorisations, and the system for safety management (SMS). If a particular area is specifically excluded, or specifically included in the exposition, the responsibilities required to be addressed may vary.

To be accepted, senior persons must have adequate knowledge and experience relevant to their area of responsibility. In addition, technical managers will be expected to have appropriate experience on aircraft or equipment similar to that for which the organisation seeks certification.

Persons nominated for these positions are expected to have a broad level of experience relevant to their area of responsibility. Lesser experience may be accepted where the area of responsibility is restricted, such as in component shops, or if the nominated persons have undergone a recognised course of training relevant to the position.

Any person exercising privileges, under the authority of a document holder, is required to be a fit and proper person (FPP) according to the criteria of section 10 of the Civil Aviation Act 1990. This includes all the nominated senior persons. The persons nominated must be identified on the application form CAA 24145/01 and a completed form CAA24FPP must be submitted for each person. The person's biographical details or *curriculum vitae* should accompany these forms.

A shorter form, the *Fit and Proper Person Declaration* (24FPPDEC) may be used by applicants who:

- have been determined fit and proper previously, and:
    - within the past five years have completed a fit and proper person questionnaire (CAA 24FPP) and have been accepted by CAA as an FPP, and
    - can attest that the facts and information declared previously are unchanged.

The responsibilities of senior persons include, but are not limited to:

(a) The control and direction of maintenance activities

Responsible for ensuring that:

(i) base maintenance carried out, including any defect rectification, is performed according to the standards specified in the organisation's exposition

(ii) maintenance carried out on the line or at outstations, including any defect rectification, is performed to the standards specified in the organisation's exposition

(iii) work carried out on aircraft components is performed to the standards specified in the organisation's exposition

(iv) standards and procedures specified in the organisation's exposition in relation to component and materials storage are complied with

(v) required data is available and accessible to staff during the performance of their tasks

(vi) required data is at the latest revision status

(vii) required maintenance records are kept in a manner acceptable to the Director, and that the records are retained for the required time

(viii) corrective and preventative action resulting from audit activity relating to maintenance control and process, are implemented in an effective and timely manner.

(b) Personnel authorisations

Responsible for ensuring that:

(i) personnel meet the initial and on-going training and qualification criteria defined in the exposition

(ii) staff are authorised appropriately for performing certifications on behalf of the organisation

(iii) personnel are assessed as meeting the prerequisite requirements for authorisation, including competence

(iv) corrective and preventative action resulting from audit activity relating to personnel authorisations and process, is implemented in an effective and timely manner.

(c) System for Safety Management (SMS)

Responsible for:

(i) helping the CE to establish, implement and maintain a system for safety management in accordance with rule 100.3

(ii) providing day-to-day leadership for people carrying out SMS work, noting the final responsibility sits with the CE

(iii) ensuring the oversight and coordination of all SMS-related policies, procedures and activities

(iv) reporting to and providing advice to the CE and line managers on SMS, including the resources needed to carry out this work effectively.

Note 1: *AC100-1, section 2.5.2,* Training and Competency Guidance Material*, is a useful reference point for managers responsible for this function, as it is an in-depth list of typical tasks and responsibilities associated with the person responsible for SMS in an organisation.*

Note 2: *CAA will require the person who carries out this role to have direct access to and be responsible to the CE. For larger organisations where the post holder may report to a position other than the CE for administration purposes, direct access is still required for matters of safety. This is normally shown in the organisation chart as a dotted reporting line.*

(d) Maintenance personnel

An organisation must be able to show that it has sufficient staff to complete all its planned maintenance activities. Where more than one maintenance contract is held, including any for work done outside of New Zealand, the total workload must be considered. It may be necessary to have a resource plan to illustrate that there will be sufficient staff, and this should relate to any hangar-visit plan that is produced. Resources dedicated to the SMS function must also be considered when assessing staffing requirements.

(e) Smallest organisations

For very small organisations involved with a limited number of light aircraft or aircraft components used for commercial air transport, it is a matter of scale. Light aircraft do not demand the same level of resources, facilities or complex maintenance procedures as larger and more complex aircraft, just as some smaller organisations have less complex procedures than larger ones do. In this case, the minimum requirement is for one full time person who meets the Part 66 requirements for an aircraft maintenance engineer licence holder and holds the position of CE. Since that person will be the certifying maintenance engineer, no other person may issue a certificate of release to service (RTS) and therefore if absent, no maintenance may be released during such absence.

For very small organisations, the CE may also issue and control the rule 145.60 maintenance authorisation required to issue certificates of RTS. Such an arrangement should be comprehensive enough to cover the scope of the organisation's activities, be acceptable to the Director and be documented in the organisation's exposition.

Similarly, in very small organisations, the CE may be the person who runs the SMS, under rule 145.65.

Note: *AC100-1, Section 1.5,* Scalability of SMS*, provides a step by step approach to working what scale of SMS is appropriate, while Section 2.2.1,* Element 1: Safety policy and accountability*, outlines key responsibilities.*

145.52 Maintenance personnel duty time limitations

An organisation must establish procedures to ensure that a person who is authorised under rule 145.60 to perform or supervise maintenance, or to certify RTS, or to certify conformity, is relieved from duty in accordance with rule 145.52. Compliance requires four distinct and separate periods with the 30 days. This is to ensure sufficient rest is provided across the 30 days to minimise the effects of fatigue.

The procedure(s) for monitoring duty hours of maintenance personnel should address:

(a) the method of data collection such as clocking or signing in and out

(b) who is responsible for monitoring and managing the limitations / time cards (or whatever process is used for recording duty times), and

(c) what actions the organisation would take in the event limitations are reached.

Note: *In addition to rule 145.52, organisations also have obligations under the Health and Safety at Work Act (2015) (HSWA) to make sure their operation is safe, including minimising the risk of fatigue for all workers. Further information and guidance can be found on the CAA Fatigue Risk Management webpage and the WorkSafe New Zealand website.*

145.53 Facility requirements

Hangars and workshops

Hangars should be of such size and construction, that the largest aircraft the organisation maintains can be completely hangared in the jacked position, except as may be agreed by CAA in a particular case. It is also important that the ground structure be sufficient to support the weight of the aircraft.

For some minor maintenance of aircraft, such as transit checks or defect rectification, hangars are not essential. However, it must be shown that hangar accommodation is available to the organisations for use during inclement weather or for rectification requiring significant de-panelling or disassembly of the aircraft.

The hangar should be permanently available for the maintenance of aircraft. If the hangar is not owned by the applicant, then it should be shown that an organisation has control of the use of the hangar. Depending on the size of an organisation, and the throughput of work, the applicant may be required to produce a visit plan to show that it can accommodate the aircraft it intends to maintain. Aircraft component maintenance workshops should be large enough to accommodate the size and numbers of components it plans to maintain regularly.

The working accommodation must protect aircraft and components from the normal weather conditions that can be expected over any 12 month period. Hangar structures and aircraft component workshops must prevent the ingress of airborne contamination such as rain, hail, ice, snow, wind and dust. Hangar and workshop floors should be sealed to minimise dust generation and to facilitate cleaning. Work areas used for different purposes should be sufficiently segregated to prevent cross-contamination. In some circumstances, cleaning and dirty work areas will need to be totally segregated from clean rooms or assembly and test areas.

For organisations that undertake calibration for internal use and / or external clients, the appropriate facility must be used as required by AC43-13 *Calibration of tools and test equipment for maintenance of aircraf*t.

Office accommodation

Office accommodation must be provided for management, planning, technical records, safety management, certifying and other staff. Offices must be of a standard that enables staff to carry out their designated tasks in a way that contributes to the safe maintenance of aircraft or aircraft components. Aircraft maintenance staff should be provided with facilities where they can study maintenance instructions and complete maintenance records properly.

It is acceptable to combine any or all of the above office accommodation, but staff must still be able to carry out their assigned tasks without undue distraction from other activities in the same office. Where offices are housed within hangars the accommodation must allow both technical and administrative work to be carried out effectively.

It is also important that the location of the office accommodation for staff who carry out supervisory and certification duties is close to the workplace, or they have a clear view of the maintenance being performed, from the office.

Working environment

The working environment includes any condition that may affect the safety or quality of the work. AMOs are required to maintain a working environment which prevents any conditions that may interfere with the safety or quality of the work being performed. The AMO must at least comply with the conditions prescribed in the appropriate manufacturer's Instructions for Continuing Airworthiness or other technical publications that detail the work. As employers, AMOs also have obligations under the Health and Safety at Work Act (2015). The WorkSafe website provides a range of advice as do the Safety Management Systems pages on the CAA website, and AC100-1.

The temperature of the working environment should allow hand tools to be used without discomfort, and allow complex maintenance operations to be accomplished safely. Where particular temperatures are required for processes, these should be able to be maintained, and the staff should be protected from temperature extremes.

Lighting should be arranged to give a level of illumination at least the equivalent of normal daylight at any time of the day. Special lighting may be required for complex or detailed task performance. Lighting should allow normal colour vision and discrimination.

Structures and machinery should not contribute to contamination of aircraft and components by the generation or release of waste, fumes, ozone or similar emissions. Airborne contamination should be kept to a minimum by means of dust suppression measures and by extraction. Some components may need protection from natural lighting, or from ultra-violet radiation.

The level of noise should not be permitted to rise to the point where it causes distraction to staff while carrying out their duties. Where it is impracticable to control the noise at source, affected staff must be provided with the necessary personal protection equipment to prevent distraction during their work.

Minor scheduled or pre-planned maintenance of aircraft in the open is acceptable provided it is closely controlled by the AMO concerned. AMOs should ensure that:

(a) work packages are continually assessed in order to determine that their contents do not include complex maintenance tasks which, with more effective planning, could be conducted at a maintenance base where covered accommodation is available

(b) due consideration is given to the weather conditions prevailing at the time the maintenance is being completed, including the extent of the external work required and the amount of protection given to the personnel involved

(c) there is sufficient ground servicing and support equipment for the tasks undertaken including provision of effective lighting, heating, portable covers and access equipment, and

(d) those areas of an aircraft that may require unscheduled work in the open (for example: for rectification of defects, major replacements, or any work where the ingress of moisture, dust etc., could be detrimental) are provided with protective cover against adverse weather conditions, and adequate lighting to facilitate the work~~)~~.

Storage facilities

Secure and separate storage facilities must be provided for serviceable and for unserviceable aircraft components, equipment and materials so that the integrity of the release documentation is maintained. These separate storage facilities should be appropriately identified to ensure proper segregation and prevent the mixing of parts in areas where multiple jobs are being performed. A person should be appointed to be responsible for their day to day operation.

In areas where there are different activities being performed, such as maintenance and manufacturing, or military and civil, the areas need to be physically segregated to prevent parts and materials from migrating between areas.

There should be separate quarantine, bond, and commercial storage areas. Petrochemicals and other hazardous substances should be stored away from each other and located so that there is no possibility of contaminating any maintenance operation. Suitable controlled arrangements should be made for the storage of bulky items such as wheels, brakes, engines, propellers and major aircraft assemblies which cannot be housed in the main store. HSNO regulations administered by the Environmental Protection Authority, may be applicable to the storage of some products.

Storage facilities for aircraft components must be clean, well ventilated and stable. Conditions of temperature and humidity should be maintained to minimise the effects of condensation. Manufacturers' standards and recommendations should be followed for specific items.

Storage racks should be provided to give appropriate conditions for all items stored. For large items, racks should be sufficiently strong and designed in such a way as to provide adequate support so that distortion of components does not occur during storage. For small items, bins should be provided so that the items are protected against damage from larger or heavier items, and so that they are easier identified and located.

Aircraft components should, wherever possible, be stored in their original packaging to minimise damage and corrosion during storage. Packaging should be checked periodically to ensure its integrity.

Stores control procedures

An organisation must establish procedures to adequately control the inward and outward movement of components, equipment and materials through the stores system. The procedures should allow for adequate control of the storage conditions by periodic monitoring. They must also provide a means to control items subject to shelf life or special storage conditions such as electrostatic sensitive devices, heavily magnetised parts or time and temperature sensitive materials.

145.55 Equipment, tools and materials

An applicant for Part 145 certification must show that all tools and equipment, specified in the manufacturer's technical documentation, are readily available to meet the intended scope of the certificate. Where a manufacturer specifies a particular tool, or item of equipment, that tool or item of equipment must be used. If that particular tool or item is not available but an alternative tool or item is, then a procedure must exist in the exposition to show how compliance with the manufacturer's standards can be achieved. Essential tools and equipment must be permanently available.

Note: *If any tool or item of equipment is so rarely needed that its permanent availability is considered unnecessary, it must be shown that the tool or equipment is available when required. A written agreement between the parties concerned will satisfy this requirement.*

Sufficient rostrums, stands or docks should be provided to permit access to all parts of the aircraft, together with suitable racks and stands for engines, aerofoil surfaces and other components removed from aircraft. Accommodation should also be provided for drawings, maintenance manuals, maintenance schedules, worksheets etc. It may be necessary to set up complete docking installations for larger aircraft, if positioning of rostrums, stands, ladders and lifts would be time consuming and would not provide comprehensive access to upper surfaces of wings, fuselage and tail.

Organisations must hold the raw materials, aircraft components, and expendables recommended by the aircraft, or component manufacturer of the equipment to be maintained. The use of alternative parts and materials may be acceptable subject to the organisation having a documented process for their review and acceptance, including the acceptance by the operator, of their use.

An organisation must provide, for the aircraft or components maintained, all the tools, equipment, and test equipment necessary to measure, calibrate, or test an aircraft, aircraft system or aircraft component to an acceptable standard. Maintenance equipment, tools and test equipment should be controlled to ensure that they remain fit for use when required.

Tools used for inspection, test and measurement are to be calibrated regularly. A clear system of identification for all tooling, equipment and test equipment must be provided, including a means of indicating to users when the next inspection, service or calibration is due. The identification method must also have a means to show whether the item is unserviceable for any reason which may not be obvious to the user. A register and record of calibrations must be maintained for all precision tooling and equipment, including staff personal tools where their use is permitted. The standards to be used for all calibrations must be clearly defined and must be acceptable to the Director. Inspection, service or calibration periods must be as recommended by the equipment manufacturer, except where an organisation can show, by statistical means, that a different period is appropriate in particular circumstances.

Note: *AC43-13 contains more information on calibration of tools and test equipment.*

Tools and equipment, including personal tools where permitted, must be controlled so that their location is always known. There must be procedures in place to ensure that there is no possibility that tools or equipment have been left in or on the aircraft or component. Procedures should address topics such as, but not limited to:

(a) Requirements for toolbox / toolboard shadowing

(b) Tool marking

(c) How to control small items that cannot be marked such as drills, rig pins, small Allen-keys etc.

(d) Tool inventory checking procedures (change of aircraft / shift change / daily / random etc.)

(e) Lost tool process.

145.59 Maintenance control procedures

This rule details the maintenance control elements required of an AMO. These elements ensure that acceptable methods, techniques, and practices are assured at each step of the maintenance process. Suggested headings and content for inclusion, as appropriate to the organisation, may be found in the sample exposition in Appendix A of this AC. Specific consideration should be given to:

(a) supply, inspection, storage, issue and disposal of materials and parts

(b) performance of maintenance activities

(c) use of contractors and subcontractors

(d) certification of RTS and issue of other documentation (see also rule 145.60)

(e) control of technical data and related documentation.

Supply, inspection and testing

The exposition must contain all the procedures necessary to ensure the integrity and airworthiness of all parts, equipment, and materials used in the maintenance of aircraft. The procedures must ensure that all products used during maintenance meet the required specification and have sufficient detail describing the inspection criteria, minimum acceptable documentation for the organisation and the processes for dealing with suspect unapproved parts and parts that do not conform to the type design or specifications.

Performance of maintenance activities

Procedures should describe how the organisation accepts and plans work from a lifecycle perspective (e.g.: receipt of a work order or contract – planning – induction – performance of maintenance and embodiment of modifications – testing – RTS – records etc). The standards expected of staff performing the maintenance should be clear to them from those documented procedures including:

(a) the selection of suppliers and the processes for receiving, tagging and storing products

(b) the tooling and equipment that has been specified including any alternatives to that stated by the manufacturer

(c) the data required to satisfy the operator's maintenance programme and ensure the continued airworthiness of the product

(d) the cleanliness and suitability of the maintenance facilities

(e) who may perform the maintenance, and

(f) what form the records and RTS should take.

On occasions it is necessary to provide a maintenance service to an operator's aircraft at a location other than those listed in the exposition. Examples of this type of maintenance would be:

(a) defect rectification

(b) daily and/or pre-flight inspections that become necessary as a result of extended downtime caused by the defect rectification

(c) as a result of aircraft diversion for unscheduled reasons

(d) a short time-period airworthiness directive (AD) compliance that occurs more frequently than the normal inspection cycle, or

(e) a 50-hour inspection of a small aircraft where the work only takes a few hours to complete.

Certificated organisations are permitted to perform this work, subject to their having procedures documented within their exposition describing the process to be followed. The procedures should include the method of documenting the request, who may make it and who will approve it on behalf of the organisation. The organisation should undertake a risk assessment of performing the maintenance at the alternative location taking into account:

(a) available premises and facilities

(b) personnel requirements

(c) tools and equipment

(d) airworthiness data

(e) documented procedures and/or procedures manual

(f) maintenance records.

The depth of this assessment will be driven by the volume and complexity of the required work scope.

Should the situation arise where the task is of a complex nature that would normally require use of base maintenance facilities, the organisation can apply to CAA for temporary use of the alternative location. The written submission should contain details of the planned scope of work, facilities available for use and the results of the risk assessment performed as described above.

Contractors and subcontractors

This AC uses the term 'contracted organisation' to indicate that an organisation is approved to perform the activity (i.e. it is working under its own SMS).

The term 'sub-contracted organisation' is used to denote an organisation that does not hold an appropriate certificate, making it necessary for the sub-contracting organisation to extend their own SMS to cover the activity performed by the sub-contractor. In this way, the sub-contracting organisation is taking responsibility for the product or service including the provision of data and authorisation of staff if appropriate.

An exposition must contain details of any contractual arrangements to provide maintenance services for an air operator. This should show how responsibilities for maintenance are allocated between the operator and the AMO. The AMO should have a procedure to ensure that it complies with its contractual obligations in respect of an air operator's maintenance control manual. The technical details of the contract should be available to the maintenance staff. This can take the form of interface procedures or simply a current copy of the contract (minus the financial details).

Appendix C of this AC details the procedures to be followed when an air operator wants to arrange with an AMO for that organisation to carry out some or all its maintenance tasks. It is not intended to provide a standard maintenance contract, but to provide a list of the main points that should be addressed, when applicable, in a maintenance contract between an operator and an AMO.

Appendix B of this AC provides an acceptable means of complying with the requirements of Part 145 when work is performed by a sub-contracting organisation or person not certificated under Part 145.

Release to service (RTS)

Details of the procedures for controlling the certification of RTS for aircraft and components must be specified in the exposition. These procedures should identify those persons or positions authorised to issue such certificates.

Technical data

Organisations must hold or have access to copies of all technical data necessary to maintain the types of aircraft or aircraft equipment for which they are certificated. This could include data that is issued by CAA, any other national aviation authority, the type certificate holder, supplemental type certificate holder, or other applicable design organisation. Data should also be held for any additional equipment that is identified by a type certificate holder in its documentation.

A new applicant will need to demonstrate access to all necessary technical data for any aircraft or components they are seeking approval for, at the compliance inspection.

Organisations must ensure that current issues of relevant documentation are available to personnel at every location where they need access to such documentation to perform the maintenance activities detailed in the applicant's exposition. The data must be available close to the work area and stored and presented so that staff can access it easily. When computer systems are used, the number of terminals must be adequate for the complexity of the maintenance performed and the number of staff. This also applies when microfilm or microfiche readers or printers are used. There must be a

procedure to control the amendment and distribution of the data so that current data is made available to all staff who need to refer to it.

Some examples of data that organisations may be required to hold or have access to are:

(a) Civil Aviation Rules (as applicable)

(b) ACs 121 and 145

(c) ADs (including foreign ADs where applicable)

(d) Type certificate data sheets

(e) Manufacturers' maintenance manuals

(f) Repair manuals

(g) Overhaul manuals

(h) Parts catalogues

(i) Supplementary structural inspection manuals

(j) Service bulletins

(k) Modification leaflets

(l) Aircraft maintenance programmes

(m) Non-destructive testing (NDT) and other specialised process manuals.

An organisation must establish procedures to monitor the amendment status of all data held, to ensure that all data is maintained to the latest amendment. Where an amendment service is available, either in hard copy or via online access, it must be subscribed to and the associated procedure must ensure that all amendments are received and incorporated. Evidence of the subscription supply contract should be made available to demonstrate continued compliance with rule 145.59(b)(8).

Where the revision status of data (such as a component maintenance manual) is in doubt due to the manufacturer no longer supporting the component, ceasing trading, or being incorporated into another organisation, the primary product type or supplemental type certificate holder should be contacted for advice since they are responsible for providing instructions for continued airworthiness (ICAs) for their product. For aircraft that no longer have a supported type certificate, the custodian of the extant airframe design data, manufacturing drawings and repair schemes for the aircraft must be contacted. Data being used to perform the maintenance activities detailed in the applicant's exposition must demonstrate compliance with Part 21 Appendix D.

If an organisation re-produces data, there must be a procedure for re-producing and controlling it. This could be maintenance data that has been transcribed from Part 145 or from other technical data into the organisation's own format, such as customised worksheets, maintenance cards, or computer-based data. To be acceptable to the Director, it is essential that accuracy of transcription is assured. There must be procedures for authorisation, production and checking of such documents.

145.60 Authorisation procedures

Personnel working within the Part 145 organisation must be authorised to perform maintenance activities specified in rule 145.60. The authorisation procedures form the cornerstone of the organisation's personnel control.

In simple terms there are two types of authorisation an organisation may elect to use:

(a) Those related to making an airworthiness determination, such as performing inspections or reviewing documents on behalf of the AMO, requiring a formal authorisation process such as that described below to satisfy the rule.

(b) Those related to business risks or processes, such as towing aircraft, operation of machinery etc., requiring business risk controls, that at the very least can establish the competence of the individual to the satisfaction of the employer.

Authorisation procedures relating to maintenance reviews, maintenance programme development etc., are an operator's responsibility; the operator authorises an individual or specific individuals to perform this task as per Parts 119 - 121 / 125 / 135. A review of airworthiness is carried out by a person who holds an inspection authorisation granted under Part 66. Reviews of airworthiness, and maintenance reviews are not considered maintenance and therefore are not covered by the authorisation system under Part 145. However, while the rule 145.60, *Authorisation process,* is the focus of this AC, the same authorisation system principles may be used by an operator for non-Part 145 activity, such as described above.

Authorisation process

There are four phases to the authorisation:

(a) qualification, where the persons qualifications are assessed against the requirements of Part 145

(b) training, where a person must have completed an acceptable course of training

(c) assessment, where that person is assessed for their technical competence to hold the authorisation – the technical oral, and

(d) providing evidence of authorisation.

Qualification

In most cases the appropriate aircraft maintenance engineer licence will indicate by its rating coverage a person's level of qualification. In the case of personnel without the licence, the rule specifies the levels of qualification required.

The organisation must define, in its exposition, the level of experience and training required for the person to be competent to certify for a particular area of maintenance. The non-licensed personnel provisions are not intended to replace or override the normal licensing requirements and should, under no circumstances, cover the full scope and privileges of a licence. The provisions therefore apply only in the following circumstances to:

(a) authorise qualified persons to certify for maintenance other than releasing aircraft to service

(b) allow unlicensed persons to certify for work of limited scope and of a repetitive nature.

In addition, the organisation should identify the qualifications required to authorise staff performing maintenance support activities, such as goods inwards inspections, planning, technical services etc.

Training

Initial or continuation training~~,~~ for staff can be conducted by the Part 145 organisation or by an appropriate training provider. The organisation's procedures will need to establish the training curriculum and standards as well as the pre-qualification standards. Pre-qualification standards are intended to ensure that the trainee has a reasonable chance of successfully completing the course. Achievement of the required standard should be confirmed by examination at the completion of training which may be either written or oral.

Initial training should cover basic theory about the type of aircraft or equipment on which the trainee is to be employed. For certifying engineers, the training should be sufficient to lead to the issue of a type rating on the particular aircraft to be certified. It should also provide instruction on the relevant parts of the organisation's exposition, particularly lines of responsibility and maintenance procedures. Any type training for certifying engineers should be delivered by either an appropriate Part 147 organisation or a Part 145 organisation holding the relevant E1 rating.

Continuation training should include instruction on any new aircraft types or changed maintenance methods, and any changes to an organisation's procedures as detailed in its exposition. Training programmes should be devised so that trained staff are readily available to take up certifying or supervisory positions as required. The temporary use of non-qualified staff to fill these positions, because of lack of available qualified staff due to illness, holidays, cessation of employment or otherwise, will not be acceptable to CAA.

For the training of a person to certify a component for RTS (as per rules 145.60 (c) and (d)), the training may be carried out by a Part 145 organisation with an E1 rating, by a Part 147 organisation, the component manufacturer, or a combination of these options. If the Part 145 organisation chooses to conduct the training under their E1 rating, the course must be of an equivalent standard as would be conducted by a Part 147 organisation, or the component manufacturer, and meet the requirements of ATA Specification 104 - *Guidelines for Aircraft Maintenance Training*. ATA Specification 104 provides a framework for component maintenance training and should be read in conjunction with this AC when establishing the training needs of the organisation.

Any training given by a Part 145 organisation under their E1 rating can only be used by that organisation and cannot be used by another Part 145 organisation as the basis for an authorisation.

Assessment

An organisation must have procedures for assessing the competency of staff employed. These procedures should include the levels of basic training, qualification, and experience necessary to accomplish the various tasks. To be acceptable, planners, supervisors, certifying staff, and technicians/ tradespersons should be assessed for competence by on-the-job evaluation, or by examination relevant to their particular role within the organisation.

Job descriptions should be drafted and kept up-to-date for all positions within the organisation. These can be used to assess:

(a) planners are competent to interpret maintenance requirements into maintenance tasks, and to recognise that they have no authority to deviate from the aircraft maintenance programme

(b) supervisors are competent to ensure that all maintenance tasks are carried out according to the relevant technical data, or to take appropriate reporting action where this is not done, or where the particular maintenance task cannot be carried out

(c) certifying staff are competent to determine when an aircraft, or an aircraft component, is acceptable for RTS

(d) technicians / tradespersons are competent to carry out maintenance tasks, to the standard specified in the relevant technical data, and know they must notify supervisors of any difficulties encountered or any additional discrepancies found while carrying out a task.

It is essential that planners, supervisors, and certifying staff have an adequate knowledge of any of the organisation's procedures which affect their role in the organisation.

Evidence of authorisation

The evidence of authorisation may take whichever form suits the certification system used by the organisation. It must be in a style that makes the privileges clear to both the authorised individual and any authorised person who may be required to examine it. Where codes are used to define the scope of certification, the interpretation document must be readily available.

Staff are not required to always carry their authorisation, but they should be able to produce it within a reasonable time frame (24 hours) at the request of an authorised person. Authorised persons may be the organisation's safety staff, maintenance supervisors, managers or authorised CAA staff. Other persons who may need to check the certification authority are members of the safety department of another certificate-holder when work is being carried out under contract.

Authorisations should have a review period to ensure they have the recent experience requirements and that the authorisation is revalidated to cover changes within the organisation. Review periods should not exceed two years, aligning them with LAME recent experience requirements.

Certification of major repairs and modifications

The rule provides for the authorisation of personnel to perform the equivalent function to the holder of an inspection authorisation. To be authorised the person must have completed a course of training on repair and modification conformity and passed an examination acceptable to the Director. The examination held in conjunction with the certificate of inspection authorisation course run by CAA is one method of meeting this requirement.

145.60 (b)(6) Limited authorisation for release-to-service certification following limited maintenance activities

For limited authorisations on Part 66 AME licence aeroplane category group 6 type, specific type rated aircraft, the following guidelines should be used to ensure that the engineer has the appropriate Part 66 AMEL and appropriate specific type training for the maintenance activity.

To ensure that the candidate has the knowledge requirements appropriate to the complexity of the aircraft / aircraft systems, the following table provides an example of a matrix approach to the requirements for limited authorisation on group 6 aircraft dependant on the person's AME licence privileges and examination credits. A definition of aircraft groups 1-6 can be found in AC66-1, *Aircraft Maintenance Engineers Licence – General.*

Table 1: An example of a matrix approach to the requirements for limited authorisation on group 6 aircraft

AMEL	Pressurised aircraft qualifications	Training would need to cover
AMEL with appropriate category(s)	AMEL subject 5 - Aeroplanes II Other Group 6 rating(s)	1. Overview on type - e.g. • ICAs • MEL etc Specific task
AMEL with appropriate category(s)	AMEL subject 5 - Aeroplanes II	1. Detail on type - e.g. • ICAs • MEL etc Specific task
AMEL with appropriate category(s)	None	1. Pressurised aircraft systems (equivalent to Aeroplanes II) 2. Detail on type - e.g. • ICAs • MEL etc Specific task

145.61 Continued airworthiness

The AMO has a responsibility to ensure that the products and components maintained, are monitored while in service. Part of this monitoring includes the investigation and analysis of defect incidents.

Defects that have no effect on safety, in any form, can be considered economic or ease-of-use defects. In other words, correcting the defect may aid production or make the item easier to use. In turn, this may result in an economic advantage to the organisation.

Defects that may result in injury, accidents, or hazards are considered defect incidents. The AMO has a responsibility to keep the users of their products and the designer of the product informed of associated improvements. The defect reporting responsibility of an AMO includes those product features that are causing a problem. That is, in-service problems that are causing utilisation or maintainability problems rather than design faults or manufacturing practices. Defect reporting to CAA is covered in Part 12, *Accidents, Incidents and Statistics*, with more detail in the related ACs.

As part of the documentation of a design, particularly a product design, there is a requirement for instructions for continued airworthiness (ICAs). These instructions should be developed by the design organisation but will involve collaboration with the maintenance or manufacturing organisations.

For in-service products the holder of a maintenance certificate should establish procedures for recording, investigating cause, and assuring corrective action of all known or reported failures, malfunctions, and defects. Procedures should ensure that:

(a) in-service problems are investigated, and prompt corrective action is taken on all affected products as appropriate

(b) users of the product are informed of the service difficulties and resultant changes to the type design

(c) feedback on in-service problems is received from the users of the products to the extent practicable

(d) requirements relative to the reporting of certain malfunctions and defects are satisfied.

The procedures required may form part of an integrated SMS.

145.63 Records

Maintenance records - media

Properly executed and retained records provide owners, operators, and maintenance personnel with information essential for the control of aircraft maintenance. These records are necessary to schedule maintenance in due time, to correct defects efficiently, and to eliminate the need for re-inspection and re-work to establish airworthiness. Records that are necessary to prove that all the requirements of Part 145 have been met for issuing the release documents~~,~~ should be retained.

Maintenance records can be either paper or electronic or any combination of these provided that:

(a) if in paper or other non-electronic form, the media provides a reliable means of assuring the maintenance of the integrity of the information, or

(b) if in electronic form:

(i) the electronic form provides a reliable means of assuring the maintenance of the integrity of the information, and

(ii) the information is readily accessible so it can be used for subsequent reference.

Computer systems may be used to control maintenance, or to record and control details of maintenance work carried out, or both. Records may be microfilmed, photocopied, carbon copied, magnetically copied, or scanned and saved to optical media (i.e. CD ROM / DVD, portable hard drives for any purpose), but the original record either electronic or otherwise, must be retained for the required period.

The records described under this paragraph should be stored in a manner that ensures protection from damage, alteration and theft. Computer backup servers, discs, tapes etc. should be stored in a different location from that containing the working server, discs, tapes etc., in an environment that ensures they remain in good condition. Procedures for electronic record and document keeping should consider the following:

(a) avoidance of data loss in the event of power interruptions

(b) software control, including amendments and prevention of corruption and security of data

(c) unauthorised access

(d) audit trail facilities

(e) archiving of data in a similar manner to hardcopies, and for a similar period

(f) backup of critical information, preferably once a day, with storage for that backup information

(g) data verification, on entry and retrieval

(h) publication provision

(i) staff training

(j) amendment and protection of stored data

(k) a problem report register including the problem details and solutions.

These requirements should be documented in an exposition and be subject to document control methods, outlined in Appendix A. Therefore, it is not considered appropriate for, and will not normally be accepted for, non- Part 145 certificated maintenance providers.

Note: *AC00-6,* Electronic Signatures, Electronic Record-keeping and Electronic Manuals*, or FAA AC120-78A,* Electronic Signatures, Electronic Recordkeeping, and Electronic Manuals*, contains more information on electronic record keeping systems.*

Staff records

A certificated AMO must keep records of all staff authorised to certify under its authority. The following minimum information should be kept in respect of each certifying person:

(a) Name

(b) Date of birth

(c) Basic training

(d) Type training

(e) Continuation training

(f) Experience

(g) Qualifications relevant to the authorisation

(h) Privileges of the authorisation

(i) Date of first issue of the authorisation

(j) The expiry date of the authorisation

(k) Identification number of the authorisation.

The record may be kept in any format but must be controlled by the organisation's senior person responsible for personnel authorisation. Safeguards must be put in place to ensure that the records cannot be altered in an unauthorised way.

Personal information must not be accessible to unauthorised persons. Organisations must comply with the Privacy Act (2020) in the management of personal information. This includes allowing access on request to the person to whom the records relate. CAA may also be entitled to access certain records in accordance with the Civil Aviation Act or Civil Aviation Rules.

In accordance with rule 145.63(b)(4), an organisation must keep the records for at least five years after the individual has ceased to be in its employment, or after withdrawal of the authorisation,

whichever is sooner. In addition, on leaving an organisation, staff should be provided with a complete record of the company authorisations that they have held.

Operator's records

Operators and AMOs are required to retain maintenance records for different reasons, and thus for different periods. Aircraft operators must retain records that define the maintenance history of the aircraft for the life of the aircraft. This includes the records of any component fitted to the aircraft.

The operator must keep, for the lifetime of the aircraft, records of:

(a) the total time in service of each airframe, engine, propeller and rotor

(b) the status of life limited parts of each airframe, engine, propeller, rotor or other aircraft component

(c) the time since last overhaul of all items installed on the aircraft that are required to be overhauled on a specified time basis

(d) the inspection status of the aircraft, including the time since the last inspection required by the maintenance programme under which the aircraft and its components are maintained

(e) the status of applicable AD, including the method of compliance, the AD identification and revision date. If the AD is repetitive, the time and date when it is to be next accomplished

(f) records of all modifications or major repairs made to the airframe, its installed engines, rotors, propellers or other aircraft components.

The operator must also keep records of all routine inspections or maintenance, such as 100-hour inspections, annual inspections, progressive inspections, or rectification of defects. These records must be maintained until the work is repeated or superseded by other work, or for at least five years after the work is completed.

Modular records

Some components, such as gas turbine engines and landing gear, are assembled from modules and a true total time in service for the complete component is not kept. When an operator wishes to take advantage of the modular design, total time in service and maintenance records for each module are to be maintained. The maintenance records, as specified, are to be kept with the module and must show compliance with any mandatory requirement applicable to the module.

Maintenance organisation's records

AMOs must keep records of all maintenance work they have carried out, for five years from the date of completion of the work. The AMO must also make available to the aircraft operator any maintenance records that it raises, but which are the responsibility of the operator. All maintenance documents are to be made available to CAA, when requested, during the period they are required to be kept.

Storage of maintenance records

The records required to be maintained should be stored so that they are protected from fire, flood, falsification and theft. As a minimum precaution they should be stored in lockable and fireproof metal containers or in a fireproof room. Computer back-up media should be stored in a different location to that containing the working media. The base records used to create the computerised records need to be secured from loss.

Record reconstruction

Organisations must have adequate systems to secure and protect records. However, lost or destroyed records can be reconstructed by:

(a) reference to other records that reflect the time in service

(b) research of records held by other AMOs

(c) reference to records maintained by individuals.

When these things have been done and the records are still incomplete, the owner or operator should make a statement in the new record describing the loss. The best estimate of the time in service should be established based on the research carried out. The reconstructed records should be submitted to CAA for acceptance. CAA may require further maintenance to be carried out before acceptance of the reconstructed records.

Return of maintenance records – cessation of trading

When a Part 145 certificated organisation permanently ceases its maintenance activities, all retained maintenance records covering the last five years must be distributed to the last operator of the aircraft or component. If it is impossible to trace the operator, then the records must be stored as directed by CAA.

145.65 Safety management

To comply with this rule, organisations seeking certification must develop, document, implement, and maintain an SMS. This system should include internal audits and regular reviews of the system for safety management.

AC100-1 provides comprehensive guidance material to help organisations implementing an SMS. Development and implementation of an SMS will not only give a structured set of tools, it will also provide significant business benefits.

Relationship between SMS and QMS

As explained in more detail in AC100-1:

"SMS and QMS share a number of common purposes and processes:

- both depend upon measuring and monitoring
- both strive for continual improvement
- both use some of the same tools, such as auditing and review.

However, a QMS does not include all the elements, features and activities of an SMS, as it focuses mainly on compliance, conformance and monitoring. SMS goes further and requires the organisation to identify and manage risk to achieve an acceptable level of safety performance."

It is not so much a case of replacing QMS by SMS, but instead, realising that they are complementary and inextricably linked - one cannot build an effective SMS without applying QMS principles."[1]

[1] AC100-1, *Safety Management*, section 1.6.1, p 19.

The SMS incorporates QMS concepts that can result in more structured management practices and continual improvement of operational processes. The guidance material in AC100-1 is designed to encourage and facilitate integration of safety thinking into the organisation's current business practices already in place such as quality, HSW and environmental control systems. See also Appendix A describing additional content for the organisation's exposition to address SMS requirements.

145.67 Aircraft Maintenance Organisation (AMO) exposition

The purpose of an exposition is to express the CE's requirements for the conduct of the organisation. It sets out the procedures, means and methods of a certificated organisation in order to establish compliance with the rules. An exposition will only be accepted if it meets all the requirements of Part 145 appropriate to the organisation. A certificate cannot be issued until the exposition is accepted by the Director.

The exposition is the means by which an organisation defines its operation and shows both its employees and CAA how it will conduct its day-to-day business. It is intended to be a tool to help management in the operation of the business. It also provides CAA assurance that an organisation has procedures to maintain compliance with applicable rules before CAA grants entry into the system.

An exposition should commence with the safety policy by the CE. The remaining parts of the exposition may be produced as any number of separate procedures manuals provided that they are cross-referenced to the management part of the exposition.

Managers should have ready access to, or should hold, copies of those parts of an exposition that affect their areas of responsibility. Maintenance staff should have ready access to and be familiar with those parts of an exposition that affect their area of employment.

Senior persons

The titles and names of the senior persons within the organisation must be listed in the exposition. Their duties and responsibilities and the areas in which they are directly responsible for liaison with the Director must be clearly defined.

Organisational structure

There must be an organisation chart showing the reporting lines of the organisation. The chart must show the lines of responsibility and means of communication from the shop floor to the CE. The exposition must show the details of the staffing structure at each place where the organisation intends to carry out maintenance. The details should include an 'approximate' number of staff, separated between certifying staff and other staff. There is no requirement to list names as this information is normally held in the staff records.

Work locations

The organisation is required to identify each location at which it intends to carry out maintenance, other than places provided for under rule 145.67(b). The level of activity at these locations must be defined and adequate facilities shown to be available.

Capability of the organisation

The organisation must define its capability in the exposition. The capability listing could take the form of a list of aircraft, or aircraft components, that the organisation is equipped and staffed to maintain. The method used to assess capability and, where permitted, add or remove items from the list through a process of indirect approval, must be specified in the exposition. Although the certificate

rating gives the broad definition of the approval, the scope against which CAA will assess the organisation will be the scope set out in the exposition. Subsequently, audit visits will determine if the organisation is performing work not covered by its capability list, or is no longer equipped or staffed to carry out all the work listed. Under these circumstances it will be in non-compliance with the rule.

Detailed procedures

The procedures listed in these paragraphs provide the working documents for the organisation's activities. The headings are generally self-explanatory and must be addressed by all applicants to the extent that they apply to the particular scope of intended activity. The procedures must accurately describe the organisation's working procedures related to its maintenance activities.

In order to be effective, a procedure should describe the *who, what, when, where, why* and *how* of the task or action to be carried out. These components of a procedure can be described as follows.

(a) Who:

(i) the procedure is relevant to

(ii) will accomplish the procedure

(iii) is responsible to see that the procedure is done

- an individual – engineer, inspector, pilot
- a position – chief engineer, safety manager, certifying engineer
- an organisation – Part 145 certificate holder

(b) What:

(i) the procedure is about

(ii) the procedure is trying to accomplish

(iii) the person performing the procedure should do.

(c) When:

(i) the procedure is to be accomplished

- the frequency in hours, cycles, or calendar time
- the actual date or time

(d) Where:

(i) the procedure will be accomplished

- the specific facility
- the specific type of facility

(e) Why:

(i) the procedure is required

(f) How:

(i) the procedure will be accomplished, according to:

- an identified manual, process control, or standard
- the operator's maintenance programme
- data approved by or acceptable to CAA

(ii) the person determines what procedure will be used and if it has been accomplished

Note: *Examples of some of the procedures which may be needed to provide an acceptable means of compliance can be found in Appendix A.*

Finally, the procedures must show how an organisation controls, amends and distributes its exposition. They must detail the origin of amendments to the exposition when any deficiency is found, in the normal course of an organisation's activities, or during an internal quality control procedure, or CAA audit. The procedures must also detail how the amendments will be controlled and distributed to holders of any affected parts of the document.

Exposition acceptance

The acceptance of an organisation's exposition by the Director will be one step in the process of approval. Evidence of acceptance of the exposition is the issue of a certificate.

Multiple certification

When an organisation seeks certification under more than one rule part that requires an exposition, it may be possible for some parts of the exposition to be common to each certificate. For instance, if the same management set-up is used for each certificate, the management part of the exposition could be common. Equally, all of the SMS procedures for one or more certificates could be placed in one manual.

Whatever format of exposition is chosen, it must be possible to clearly show how each part of the applicable rule is satisfied. It is desirable that a supplement is provided showing where compliance is achieved for each rule part. This could take the form of a cross-referencing table or matrix showing where the common requirements of the applicable parts are covered, such as the CAA 24145/02 which includes Parts 12 and 43 elements as appropriate.

Note: *Any difficulty in establishing compliance will require more investigation time, resulting in additional cost to an applicant organisation.*

Subpart C — Operating Requirements

145.101 Continued compliance

A certificated organisation is required to ensure that copies of its exposition are available at each work location specified in its exposition. This is to ensure that all members of its staff have access to the exposition while at work. The organisation must comply with all the procedures detailed in the exposition. It must also continue to meet the standards and conditions, that were required for initial certification, during the validity period of the certificate.

145.103 Privileges and limitations of authorisation holders

This rule requires all certifications to be performed by persons appropriately authorised in accordance with the authorisation procedures in the exposition. Reference is also made to Part 43 Subpart C for the purposes of releasing aircraft or components to service and the performance of duplicate inspections. AC43-1, *Aircraft Maintenance,* provides further guidance on these subjects.

145.105 Changes to certificate holder's organisation

A certificated organisation must always ensure that its exposition continues to be an accurate description of its activities. However, before any of the changes listed in rule 145.105(d) occur, a certificate holder must gain CAA's prior acceptance. CAA may prescribe conditions to be applied, either during the change-over period, or permanently, if it does not consider that the new conditions will achieve the same level of safety.

These *transitional conditions* allow an organisation to continue to operate while not fully meeting the conditions of its approval. The organisation can then negotiate with CAA as to the permanent changes that are required. Without this dispensation the approval would be effectively invalidated as the company would no longer comply with its exposition.

CAA may, at any time, require the organisation to amend its exposition if it considers that this is necessary in the interests of safety.

To summarise:

(a) An organisation may make changes to its exposition to reflect changes in its operating procedures. Sending an amendment of its exposition to CAA is accepted as notification to CAA.

(b) Certain designated changes require prior acceptance by CAA.

(c) The Director may require the organisation to make changes to its exposition if such changes are considered necessary in the interests of safety.

Appendix A: Organisation Exposition

General

The guidance in this appendix is intended to cover organisations ranging in size and complexity of organisation, and number and size of aircraft that may be maintained. However, it is descriptive not prescriptive in content. Organisations may choose which parts of the text they wish to adopt/adapt, expanding the content where necessary to reflect their processes provided the intent of rule 145.67 is met.

Front matter

The exposition cover page should identify:

(a) the rule part the exposition is applicable to (for example: Part 145)

(b) AMO number

(c) name of the organisation

(d) physical address of the organisation

(e) manual control number (document reference)

(f) holder of the exposition copy.

Each page of the exposition should be identified in the header / footer with:

(a) organisation's name

(b) original or revision date, as appropriate

(c) section and page number.

Exposition revision control

This section shows how the exposition is controlled from the original issue through subsequent revisions and the distribution of copies (including electronic copies). This part of the exposition should contain:

(a) A Table of Contents –-to show each subject and its specific location within the exposition.

(b) A 'list of effective pages' (LOEP) – this list is used to control the revision of each page in the exposition. Each page of the exposition will be listed with the original or current revision date, as appropriate. The list of effective pages will be revised at each revision.

(c) A 'record of revisions page' – this page will be used to record each revision when it is placed in the exposition. It should have provisions for recording the revision number, the date of the revision, the date inserted, and person making the revision. It should also include an exposition distribution list showing the copy number and person holding it to ensure that each holder receives the revisions.

Abbreviations, acronyms and definitions

Depending upon the complexity of the organisation, it may be helpful to include a glossary of such terms to permit the use of the shortened form throughout the document. Further guidance may be

found in the 'common support data dictionary' (CSDD) published by the Air Transport Association of America (ATA). The CSDD replaces the 'world airlines' technical operations glossary' (WATOG).

Section 1 – AMO

This section should include:

(a) safety policy – outlining the organisation's commitment to safety (refer to AC 100-1, Section 2.2.1 for further detail).

Management and personnel

This section should describe the personnel structure of the organisation and the related duties and responsibilities of the key supervisory and certifying personnel to include:

(a) A list of the senior management personnel and any arrangements for staff to deputise in their absence (if applicable).

(b) The duties and responsibilities for all key supervisory and certifying personnel, by title only (as listed on the organisational chart below). Language should be clear and easy to understand.

(c) An organisation chart showing:

  (i) the correct titles of all supervisory and certifying personnel as identified by company personnel position descriptions

  (ii) the separation between maintenance or production departments, and the safety department~~s~~ or team.

(d) A list of authorised company personnel and their delegated authorisations. The list must show those people authorised to issue certificates of RTS. It must include signature authority for official correspondence with CAA. This could include authority for amendments to the exposition, capability lists, and applications for renewal of certificates. The list is not required to be part of the exposition, but it must be shown in the exposition:

  (i) who maintains the list

  (ii) where the list is maintained, and

  (iii) the frequency of revision.

(e) A procedure for ensuring that the duties and responsibilities of supervisory and certifying personnel are delegated to others in their absence.

Housing and facilities

For each line and base maintenance facility (including any third-party facilities regularly used by the organisation) the description and layout of housing and facilities should include as applicable:

(a) the type of buildings and facilities

(b) the type of construction

(c) the type of floors, lighting, natural light, heating, cooling, electrical, compressed air systems, fire protection systems, computer systems or other services

(d) any special requirements applicable to stripping, machining, plating, welding, composite and fabric work, painting, non-destructive testing (NDT), airframe, engine, electrical, instrument, radio, accessory and propeller ratings

(e) the details of any built-in lifting, jacking, or access equipment

(f) the total working, area to include dimensions and floor plans for hangars, shops, offices, stockrooms, and all other space

(g) details of suitable enclosed space to assemble the largest item to be worked under the rating

(h) the provisions for adequate storage, separation, control, and protection of parts and materials.

Scope of work

The organisation's approved scope of maintenance will be defined by the approval certificate / exposition acceptance and exposition, either directly or indirectly approved (where a procedure to remove or add items has been accepted) by CAA. The approval certificate / exposition acceptance may list the main locations, classes, ratings and their limitations for the maintenance services that the organisation is approved to provide.

The exposition should specify the scope of maintenance it has the capability to perform at each of its locations.

This section of the exposition may also contain the capability list for each component that the organisation is equipped and staffed to work on. It should define these by applicable CAA rating, manufacturer, model, part name, part number, Air Transportation Association (ATA) code or aircraft model on which a component is used. Any combination of these may be used to provide the best description of the organisation's capability.

There should be procedures for maintaining the capability list and for adding components to the capability list. These procedures should include provision for review and acceptance by CAA, including consideration of:

(a) technical data available and current

(b) training and qualified personnel

(c) appropriate facilities

(d) tools and equipment available.

The capability list may be a separate document, but it should have the same provisions for control of revisions and distribution as the company exposition.

Change notification procedures

Administrative procedures including procedures to notify CAA of any changes to:

(a) the CE or the listed senior persons, including the introduction of new personnel or changes of personnel within the organisation (as required in the FPP process)

(b) the location(s) at which maintenance is carried out

(c) the organisation's SMS (if the change is a material change)

(d) proposed changes to the ratings for which the certificate was issued

(e) procedures for applying for renewal of the AMO certificate

(f) procedures for application for additions, and changes, to ratings.

Exposition amendment procedures

This section should identify:

(a) how the organisation ensures that the exposition is kept up to date and maintains compliance with requirements of Part 145 in relation to its content, and who is responsible for this

(b) how any proposed change to the exposition is initiated, and who is responsible for assessing the proposed change, to determine whether the change needs to be approved by CAA, or whether it may be approved in-house.

The section should set out the procedures for making applications for changes to CAA or if applicable, the procedures for in-house approval by the AMO. It should also identify the individual who is responsible for incorporating the change in the exposition once it is approved.

Section 2 - Maintenance procedures

This section contains a list of activities and suggested headings for inclusion under each topic depending upon the complexity and scope of the activities undertaken. They are organised as progressive processes rather than following specific rule parts.

Supplier evaluation and subcontract control procedure

Company policy on sourcing supplies / records of parts utilisation / approved suppliers / pre-contact audit and monitoring of suppliers / system for placing orders / control of sub-contractors.

Receipt / inspection / acceptance of components (aeronautical products)

Component and material acceptance procedures (sources, conformity, records) / incoming inspection (required documentation, compliance with order, condition, quarantine procedure including suspect unapproved parts) / acceptance of components from internal sources / components removed serviceable from aircraft / components received from customers for repair and/or overhaul.

Note: *Refer AC00-1 and AC00-2 regarding acceptability of parts and stores controls*

Storage, tagging and release of components (aeronautical products)

Maintenance of satisfactory storage conditions / control of shelf life / control of modification standard / tagging and/or labelling system (serviceable, unserviceable, robbery, scrap etc.) / segregation according to condition (serviceable, unserviceable etc.) also to the nature of parts (ESD sensitive, highly magnetised, HSNO, DG etc.) / issue of parts to the maintenance process (including free issue dispensing of standard parts – control, identification, segregation) / disposal of unsalvageable (scrap) components.

Tools and equipment

Procedure for receiving tools and equipment / method for tracking service life / method of labelling tooling serviceable or otherwise / method of storing the paperwork specific to each item including manufacturer's instructions and calibration reports / process for acceptance — (identification,

certification, control, calibration) / procedure for identification and approval of data for the use of alternative tools and equipment.

Calibration of tools and equipment

Inspection, servicing and calibration programme / equipment register / establishment of inspection, servicing and calibration time periods and frequencies / identification of servicing and calibration due dates / list of standards being used / calibration procedures for serviceability and accuracy / recording and storage of the calibrated item and the standard it was calibrated against / procedure for quarantine and investigation of tools and aeronautical product or aircraft affected by the discovery of out of tolerance tooling.

Note: *Refer AC43-13 regarding calibration of tools and test equipment for maintenance of aircraft*

Use of tooling and equipment by employees

Issue of tools (record of user and location) / determining tool serviceability prior to issue / training and certification of employees in the use of tools and equipment / personal (own) instrument/tool control / loan tool control / alternative tool identification, data approval and use (can reference 'tools and equipment' heading above).

Cleanliness standards of maintenance facilities

'Foreign object' exclusion programme / cleaning programme — individual responsibilities and timescales / waste material disposal / segregation of working spaces / dust suppression and environmental control in the workspace.

Maintenance instructions

Control of information — technical library (information held, control, issue) / technical information amendment procedures (manuals, service information) / uncontrolled copies of manuals / awareness of technical publications, instructions and service information / maintenance documentation (preparation from approved sources, amendment control) / review and identification of amendment status of maintenance instructions / distribution of maintenance instructions - access by maintenance personnel / control of customer supplied ICAs / company technical procedures or instructions / the verification and validation of new procedures where practicable / incorporation of best practice and human factors principles.

Repair procedure

Company policy (internal/external sources of repair approval) / company approvals (scope of work, limitations and conditions) / definition of major a repair for aircraft or components / control system for fabrication of parts in the course of maintenance, processing and inspection.

Airworthiness directives procedure

AD response procedure (terminating action/ inspection) / records of AD compliance and certification / repetitive AD requirements (inspection control) / operator interface where alternative means of compliance (AMOC) or deferred compliance is sought.

Optional modification procedure

Continued airworthiness information (assessment procedure and methods of response) / modification control (operator requirements and approval) / definition of major modification for aircraft or components.

Maintenance documentation in use and its completion

Worksheets for non-routine tasks / assembly of work packages for issue to maintenance activity / work sheet/card completion / maintenance sign-off and the performance of maintenance certification / assembly of completed work package for RTS / recording of test results and dimensions / control and use of customer supplied work card/sheets / the sequential numbering or other positive control / identification of: AMO; customer; aircraft; component (aeronautical product).

Technical records control

System for control, storage and retrieval (paper or computer based) / control of access to records (paper and/or computer based records) / record-keeping systems (definition of 'essential' or 'quality' records) / turbine engines, complex landing gear - module records / disposal of records - transfer of aircraft / lost or destroyed records (reconstruction and CAA acceptance) / provision of maintenance records to operator / retention of records (periods, methods and security).

Rectification of defects arising during base maintenance

Recording and sign-off of base maintenance defects / carrying forward defects to future maintenance inputs (control and accountability) / analysis of defects and rectification (human factors, maintenance programme implications and reliability).

Maintenance certification and certificate of RTS

Company procedures (RTS-statement) / issue of RTS after base maintenance / issue of an RTS after line maintenance / issue of an RTS with uncompleted work / issue of an RTS by authorised flight crew / issue of a certification authorisation for a single maintenance event / sign-off after maintenance task completion / issue of CAA Form 1 / Form 1 certification – method of identifying qualified employees / RTS - cross-reference to work packs / RTS of aeronautical products removed serviceable from aircraft.

Records for the operator

Contracted record keeping — specific operators / arrangements for processing and retention of maintenance records.

Reporting of defects to CAA / operator / manufacturer

Methods of reporting to CAA (Part 12); manufacturer; operator / persons responsible for reporting / reports must contain pertinent information and evaluation results (where known) / defects reported by subcontractors / permitted reporting periods and retention of data / reportable defects investigation procedure and follow-up system including reporting timescale.

Return of defective components (aeronautical products) to store

Labelling and identification (required information) / handling and movement of components / storage of defective components / components "on hold" (pending determination of serviceability status).

Defective components (aeronautical products) to outside contractors

Dispatch of components for repair – overhaul - calibration / control of dispatch, location and return / identification of required work / return of unserviceable loan parts.

Control of computer maintenance records system

Information retrieval / back-up systems and second site storage / security and safeguards to unauthorised access.

Duty hours planning versus scheduled maintenance

Forecast planning vs actual time available procedure (managing peaks and troughs) / complexity of work / organisation of shifts / method of taking human performance limitations into account.

Control procedures for critical tasks

Duplicate inspection procedures / critical task procedures and control (for example: Extended Diversion Time Operations (EDTO)) / critical task list).

Specific maintenance procedures

Engine running / aircraft pressurisation checks / aircraft towing / aircraft taxiing / scrapping of unsalvageable parts / working away from main base or workshop.

Procedures to detect and rectify maintenance errors

Aims and objectives of error management system / the encouragement of reporting / a code of practice / description of the process to reports occurrences (not just reportable occurrences under Part 12) / description of the process to investigates occurrences / description of the process to records occurrences / the analysis of occurrence data / management actions in response to occurrence findings / feedback to employees / sharing information from investigations.

Shift / task handover procedures

Aims and objectives of the shift handover / training of personnel in shift or task handover processes / recording of shift or task handover / description of shift handover process for: facility status; work status; manning status; outstanding issues.

Procedures for notifying maintenance data inaccuracies and ambiguities

Definitions of maintenance data ambiguities / responsible person for coordination of reporting and remedial actions / method of internal reporting of maintenance data ambiguities / method of external reporting of maintenance data ambiguities to the authors of that data / feedback to staff and implementation of Type Certificate (TC) holder/manufacturer/design authority corrections.

Production planning procedures

Establishment of a clear work order or contract / procedures for establishing all necessary resources are available before commencement of work / procedures for organising maintenance personnel and providing all necessary support during maintenance / consideration of human performance limitations / planning of critical tasks.

Section L2 - Additional line maintenance procedures

This section contains a list of activities and suggested headings for inclusion under each topic where the line maintenance process differs from that utilised at the main base. In each case below, consideration should be given to the procedures and processes required by the relevant aircraft operator.

Control of components (aeronautical products), tools, equipment, etc.

Component and material acceptance - required, documentation, condition, "quarantine" procedure / components removed as serviceable from aircraft / procedures for maintaining satisfactory storage conditions — (perishables, flammable fluids, engines, bulky assemblies, special storage requirements) / system for control of shelf life and modification standard / tagging & labelling system (serviceable; serviceable removed from aircraft; unserviceable; scrap; suspected unapproved parts; quarantine etc.) / issue of parts and materials to the maintenance process / free-issue dispensing of

standard parts (control, identification, segregation) / tools and test equipment, servicing and calibration program and equipment register / identification of servicing/calibration due dates.

Procedures related to servicing / fuelling / de-icing etc.

Maintenance documentation - control and amendment / airworthiness data - control and amendment / fuel supply quality monitoring: bulk storage; aircraft re-fuelling / ground de-icing: procedures; monitoring of sub-contractors / maintenance carried out in the open – limitations.

Control of defects and repetitive defects

Defect reporting by: pilot; engineering; cabin staff / deferred defect classification system / rules for deferral: periods; review; permitted personnel; conformity with minimum equipment list (MEL)/ configuration deviation list (CDL) provisions / certification of defect rectification including the transfer of defects to worksheets or work cards / awareness of deferred defects carried by aircraft — monitoring of repetitive defects / communication with main base.

Procedure for completion of operator technical log

Explanation of technical log system (completion of sector record page, distribution of copies) / certification of: maintenance; pre-flight/transit; EDTO; duplicate inspections / maintenance control systems (special inspections, out-of-phase maintenance) / retention of records / maintenance statements.

Procedure for pooled parts and loan parts

Verification of approved sources of parts — modification standard and AD compliance / compliance with loan and contract requirements - tracking and control / required documentation / processing removed loan parts for return to source - service record / cannibalisation (robbery) system - control procedures and authority.

Return of defective parts removed from aircraft

Required documentation - service record / processing advice of removal and dispatch to technical records / dispatch for rectification.

Procedure for control of critical tasks

Line specific procedures covering the allocation of staff and assignment of secondary inspections.

Section 3 – Safety Management

Refer to AC100-1.

Section 4 – Authorisations

Certifying employees – qualifications and training

Experience, training and competence requirements / examination, test or assessment procedure / initial and continuation training procedures / qualifying subcontractor's personnel (if applicable) / authorisations issue and renewal procedures / currency requirements / licence validity (maintenance performed outside New Zealand) / age requirements / single event authorisation (one-off) / flight crew limited certification authorisation.

Certifying staff records

List of certifying personnel / minimum information list of employee particulars / control of certifying staff records / access to employee records / retention of records / format of authorisation document and authorisation codes / the method of identifying each authorised person by: the name of each

person; their authorisation number; the type of licence held; their licence number; their signature, initials or stamp; the privileges and limitations of each authorisation.

Qualifying mechanics / other inspection staff

Experience, training and competence requirements / specific training for stores inspection (for example: suspect unapproved parts, electrostatic discharge (ESD) etc. / examination, test or assessment procedure / continuation training procedures / qualifying subcontractor's personnel (if applicable) / authorisations issue and renewal procedures.

Qualification procedure for specialised activities such as NDT, welding, composite materials etc.

Experience, training and competence requirements / examination, test or assessment procedure / continuation training procedures / qualifying subcontractor's personnel (if applicable) / authorisations issue and renewal procedures / auditing of staff and system.

Qualifying audit employees

Nominated personnel / allocated man-hours (if not full-time) / independence of quality audit personnel / experience (duration and technical), training and competence assessment requirements / continuation training (programme and procedures).

Manufacturer's and other maintenance working teams

Source of work / authorisation of personnel / system for control of materials / working instructions and procedures / control of documentation (drawings, modification, repair instructions) / environmental conditions / final certification under the authority of the Part 145 certificate.

Control process for deviation from the organisation’s procedures

System for approval and control of concession / concession criteria / request procedure / evaluation, response and approval.

Human factors training procedure

Aims and objectives / categories of staff to be trained / duration / requirements for trainers / training methods and syllabus / continuation training.

Competence assessment of employees

Personnel to be assessed (rule 145.51(b)(1)) / assessment procedures (training, qualifications, supervision, assessors) / management competence assessment / assessment records.

Section 5 – Operations

Contracted operators

List of operators for whom maintenance is provided, with details of the types of aircraft (engines/auxiliary power unit (APU)) / scope of work undertaken, (for example: base maintenance, line maintenance, defect rectification etc. with any limitations).

Operator procedures and documentation

All tasks should be described, that are performed by the AMO to support the operator: spares management procedures; engine management programme; reliability monitoring and data input to the operator reliability program; deferred and repetitive defect monitoring and reporting to the operator; aircraft external damage control - identification and control; reporting of un-airworthy conditions / access to and updating of the air operator’s exposition or system of maintenance.

***Note**: It may be more practical for these details to be held in separate operator interface procedures referenced from the exposition.*

Operator records completion

Completing operator's logbooks / keeping the operator's technical records – see also Section 2 procedures for 'records for the operator'.

Section 6 – Training and assessment (E1 rating or internal training)

Facilities

Training facilities / instructional equipment / maintenance training material including currency of technical data.

Personnel

Personnel responsible for training management / instructors / assessors / records of instructors and assessors.

Training and assessment procedures

Course plans / course material / conduct of training / aircraft system training / aircraft type training / conduct of assessment / aircraft type assessment / security of assessment material.

Training sourcing and quality control

Sourcing manufacturer's training / procedures to ensure training meets the standards required by Parts 66 and 147 / aircraft type training / aircraft type assessment / quality system interface with training – audit programme.

Records

Student records (attendance, subjects, practical work undertaken, results of assessments) / retention periods (rule 147.19).

Section 7 – Appendices

The lists shown may be kept as separate documents from the exposition as long as an adequate cross-reference is included in the exposition.

List of documents

This is a typical list of company's forms and is not intended to be exhaustive or to represent the forms required for particular organisation. The approved organisation should include those forms with which it controls and records its maintenance work and procedures. Typically, these are the documents that are referenced within the exposition procedures.

(a) Goods inwards inspection record (GRN)

(b) Serviceable, unserviceable labels

(c) Register (or card) of precision equipment and tools

(d) Test equipment "calibration due" tag

(e) Controlled manual / service information identification

(f) AD control card / record

(g) Continued airworthiness information (service bulletin etc.) assessment record

(h) Form CAA 337 or equivalent

(i) Maintenance task card (scheduled maintenance)

(j) Maintenance task card (additional defects)

(k) Life-limited parts/out-of-phase work or inspection-record card

(l) Base maintenance RTS

(m) CAA Form 1 or approved in-house release form

(n) Safety report form

(o) Audit report form

(p) Safety investigation report

(q) Audit remedial action report form

(r) Employee training record

(s) Certifying employee's authorisation record

(t) Certifying employee's personal authority

(u) Training records and forms

(v) Risk assessment records

(w) Risk register.

List of subcontractors

See Appendix B to this AC.

List of line maintenance locations

If line maintenance locations are established by the organisation.

List of contracted Part 145 organisations

See Appendix C to this AC.

Rules checklist (also known as compliance matrix or rules compliance matrix)

Appendix B: Sub-contracting

Introduction

Appendix B gives an acceptable means of complying with the requirements of Part 145 when work is carried out by a sub-contracting organisation or person not certificated under Part 145. This work is an extension of the work carried out by the certificated organisation and under the control of its SMS. The responsibility for providing the necessary documentation for all maintenance carried out and authorisation of staff certifying that maintenance rests with the contracting organisation.

Note: Refer to AC100-1, section 1.4.3, Managing suppliers*, for more guidance.*

General conditions

Any AMO certificated under Part 145 may sub-contract maintenance to a non-certificated organisation if there is provision in its exposition for such sub-contracting.

The following general conditions should be considered:

(a) When maintenance is carried out under the sub-contract control system, the Part 145 certificate has been temporarily extended to include the sub-contractor for the duration of that maintenance. Those parts of the sub-contractor's facilities, personnel, and procedures, involved with a certificated AMO's products must meet Part 145 requirements for that time.

(b) An AMO does not need to have its own facilities to carry out all maintenance that it wishes to sub-contract. It does need to have its own expertise to decide that the sub-contractor meets the necessary standards and that any maintenance is carried out to the acceptable maintenance instructions.

(c) An AMO may find it necessary to include in its documentation several specialist sub-contractors to enable it to be acceptable to maintain a particular product. To approve such a sub-contract the Director will need to be convinced that the contracting AMO has the necessary expertise and procedures to control such sub-contractors. Examples could be specialist welding, specialised plating, painting or non-destructive testing.

The AMO is responsible for all maintenance carried out by its sub-contractors. Where that organisation fails to control a sub-contractor, it may put at risk part or all of its own Part 145 certification.

The extent of sub-contracting is only limited by the expertise and procedures of the AMO.

Approval to sub-contract is shown by the Director accepting the exposition containing a specific section on the control of sub-contractors and a list of the sub-contractors.

Procedures

Where procedures for the control of sub-contractors are being created, the following items should be considered.

(a) A pre-assessment procedure under which the AMO's sub-contract control section should visit a prospective sub-contractor.

Note 1: *This visit will determine whether those parts of the sub-contractor that it wishes to use meet the requirements of Part 145 before any maintenance is placed with the sub-contractor.*

(b) A procedure to ensure the upgrade of the relevant parts of the sub-contractor to meet the intent of Part 145, if the contractor does not already meet the requirements.

(c) An assessment of the extent that the AMO will use the sub-contractor's facilities.

Note 2: *Usually the AMO will require its own paperwork, maintenance instructions, material and spare parts to be used. It may permit the use of tools, equipment and personnel from the sub-contractor if such tools, equipment and personnel meet the requirement of Part 145.*

(d) Where the product can be fully inspected on receipt, procedures for the certificate of RTS to be issued by the certifying staff of the Part 145 organisation.

(e) Where the product cannot be inspected on receipt, procedures for inspection during production at the sub-contractor's facility.

Note 3: *The product may not be able to be inspected on receipt, either because there are intermediate inspection stages or because the component is complex. The safety function of the organisation must be transferred into the sub-contracting organisation. Such activities should be fully explained in the exposition to show that there is adequate control of the process.*

(f) Where inspection and certification are carried out at the sub-contractor's facility, procedures for the certificate of RTS to be issued either by staff of the contracting AMO or of the sub-contractor.

Note 4: *Certifying staff in either case must be qualified and authorised by the contracting organisation following the procedures in its exposition.*

(g) Procedures for the control of sub-contractors, to record visits to sub-contractors, to have a corrective action follow-up plan, and to show when sub-contractors are being used.

(h) Procedures for the audit of the sub-contract control section and sample sub-contractors by the AMO's safety staff.

Note 5: *The contract with sub-contractors should make it clear that the right of CAA staff to carry out a safety audit of the certificated organisation applies equally to any listed sub-contractor.*

Appendix C: Maintenance contracting arrangements

Introduction

Appendix C details the procedures to be followed when an air operator wants to arrange with an AMO to carry out some or all of its maintenance tasks. This information will be of use to AMOs certificated under Part 145 and wishing to carry out contracted maintenance tasks for air operators.

Responsibilities

The aircraft operator is responsible for all aspects of the maintenance of the aircraft, including both planning and carrying out the maintenance. This includes responsibility for:

(a) properly planning all necessary maintenance

(b) providing adequate documentation, such as operator's maintenance manuals, aircraft maintenance, repair and parts manuals, maintenance schedules and associated recording documents, necessary to ensure that the planned maintenance can be properly carried out and recorded

(c) providing aircraft reliability programmes, and control of development of maintenance schedules

(d) airworthiness occurrence control including reporting and control of defects

(e) complying with all applicable ADs

(f) assessing, and actioning as appropriate, all manufacturers' service bulletins or other service recommendations

(g) providing adequate and trained technical and other staff so that the maintenance can be properly carried out

(h) providing adequate accommodation, equipment, tools, and facilities so that the planned maintenance can be properly carried out

(i) providing, accepting, and storing aircraft spares

(j) making the aircraft available to the persons who are to perform the maintenance whenever maintenance is due and giving adequate technical direction for all work to be carried out

(k) carrying out necessary servicing of aircraft and aircraft components

(l) completing all required flight records and logbooks and actioning any entries that require such action

(m) maintaining all aircraft documents such as aircraft flight manuals and associated minimum equipment lists at the current status.

Note: *The operator may choose to contract other persons or organisations to carry out any or all of the above tasks. However, contracted arrangements for accomplishing these tasks do not absolve the operator from the final responsibility for ensuring the safe operation and continuing airworthiness of the aircraft.*

General conditions

When establishing a contract between an air operator and an AMO to carry out any of the above listed tasks, the following general conditions should be considered:

(a) The air operator will be responsible for satisfying CAA that the AMO is able to satisfy the terms of the contract.

(b) A formal agreement should be established between the two parties in accordance with this AC defining which functions are to be contracted. This agreement should form a part of the exposition of each party.

(c) The operator must nominate a senior person from within the company to liaise with the contracting organisation on contract matters.

(d) The operator's SMS must address the risks associated with the activities carried out by the contracting organisation. Performance goals and associated measures should be included in the contract.

(e) An arrangement by which more than one AMO is nominated by an operator in respect of a particular aircraft type will not normally be acceptable to CAA, other than for tasks carried out at route stations or specific significant maintenance tasks (modification programmes, significant structural repair etc.).

(f) In its assessment of the arrangements made by the operator for the contracting of any of the listed tasks, CAA may need to examine all technical agreements between the parties. The contract should form a part of the exposition of each organisation.

(g) A significant change to the contract or technical agreement may require~~s~~ the prior acceptance of CAA and should be notified as soon as practicable.

Note: *This could be, for example, an intention to change to another AMO, or a significant organisational, procedural or technical change to an agreement.*

Detailed content of the maintenance agreement

The contract between an operator and an AMO should consider the points in the following paragraphs, as appropriate for their arrangement. Since only the technical parts of the maintenance contract need to be acceptable to CAA, it is only these that are addressed; financial matters such as costs, delay, warranty etc. have been omitted.

(a) Operators name and air operator certificate number (if applicable). Name and CAA certificate number of the contracted organisation.

(b) Scope of work - the type of aircraft and engines subject to the maintenance contract should be specified. It should preferably include the aircraft's registration numbers. The type of maintenance to be performed by the AMO should be specified unambiguously.

(c) Locations identified for the performance of maintenance / certificates held - the place(s) where base and line maintenance will be performed should be specified. The certificate held by the AMO at the place(s) where the maintenance will be performed should be referred to in the contract. If necessary, the contract may address the possibility of performing maintenance at any location subject to the need for such maintenance arising either from the unserviceability of the aircraft or from the necessity of supporting occasional line maintenance.

(d) Subcontracting - the maintenance contract should specify under which conditions the certificated organisation may subcontract tasks to a third party (whether this third party is certificated under Part 145 or not) such as for NDT, welding, aircraft weighing or painting. In addition, the operator may require the AMO to request the operator's approval before subcontracting to a third party. Access to any information about the AMO's subcontractors involved in the contract should be given to the operator.

(e) Maintenance programme - the maintenance programme under which the maintenance must be performed should be specified.

(f) Safety assurance the terms of the contract should include a provision allowing the operator to perform internal audits upon the Part 145 approved organisation. The maintenance contract should specify how the results of internal audits are considered, and where necessary acted on, by the AMO.

(g) Airworthiness data - the airworthiness data used for the purpose of the contract as well as the authority for the acceptance/approval should be specified.

(h) Incoming conditions - the contract should specify in which condition the operator must send the aircraft to the AMO (for example: cleaning, fuel load, specific time slots etc.). For significant maintenance inputs, it may be beneficial that a work scope planning meeting be organised so that the tasks to be performed may be commonly agreed. For complex components such as engines or landing gear, it is important to specify the configuration of the component, (for example: including the list of the sub-components that remain fitted before sending it to the AMO).

(i) AD and service bulletins / modifications - the contract should specify what information the operator must provide to the AMO, such as the due date of the AD, the selected means of compliance, the decision to embody service bulletins or modification, etc. In addition, the type of information the operator will need in return to complete the control of ADs and modification-status should be specified.

(j) Hours and cycles control - hours and cycles control is the responsibility of the operator, but there may be cases where the AMO needs to be in receipt of the current flight hours and cycles on a regular basis so that it may update the records for its own planning functions.

(k) Life limited parts – life limited part control is the responsibility of the operator. The AMO should provide the operator with all the necessary information about the life limited part removal/installation so that the operator may update its records.

(l) Supply of parts - the contract should specify whether a particular material or component comes from the operator's or the AMO's store, which type of component is pooled, etc. It is the AMO's responsibility to be satisfied that the component in question meets the approved data/standard and to ensure that the aircraft component is in a satisfactory condition for fitment.

(m) Scheduled maintenance - for planning scheduled maintenance checks, the support documentation to be given to the AMO should be specified. This may include, but may not be limited to applicable work package, including job cards; scheduled component removal list; modifications to be incorporated etc. If the AMO determines, for any reason, to defer a maintenance task, it should be formally agreed by the operator.

(n) Unscheduled maintenance / defect rectification - the contract should specify to which level the AMO may rectify a defect without reference to the operator. As a minimum, the approval and incorporation of major repairs should be addressed. The deferment of any defect rectification should be submitted to the operator. In addition, the use of the operator's MEL and the liaison with the operator in case of a defect that cannot be rectified before the planned departure, should be addressed.

(o) Testing - if any test flight or operational flight check is required, it should be performed in accordance with the operator's exposition. For significant components requiring bench testing or test cell runs, the contract should specify the acceptability criterion and whether a representative of the operator should witness the testing.

(p) RTS documentation - the RTS has to be performed by the AMO in accordance with its MOE procedures. The contract should, however, specify which support forms should be used (operator's technical log, AMO's maintenance visit file, etc.) and the documentation the AMO should provide to the operator upon delivery of the aircraft.

(q) Maintenance records - the operator may contract the AMO to retain some of the maintenance records required by Rule 91.617. In such cases, access to these records should be given by the AMO to the operator or other authorised person.

(r) Exchange of information - each time exchange of information between the operator and the AMO is necessary, the contract should specify what information should be provided and when (i.e. on what occasion or at what frequency), how, by whom and to whom it has to be transmitted.

(s) Meetings - the terms of the maintenance contract should include the provision for a certain number of meetings to be held between both parties so that a good communication path exists.

    (i) Scope of the work planning meetings may be organised so that the tasks to be performed may be commonly agreed.

    (ii) Technical meetings may be organised in order to regularly review technical matters such as ADs, service bulletins, future modifications, major defects found during maintenance checks, reliability, etc.

    (iii) Safety meetings may be organised in order to examine matters raised by the operator's internal audit programme and to agree upon necessary corrective and preventive actions.

    (iv) When a reliability programme exists, the contract should specify the operator's and AMO's respective involvement in that programme, including the participation in reliability meetings.

(t) Contract review - before the contract is applicable, it is very important that the technical personnel of both parties meet to ensure a common understanding of the duties of both parties.