

AFRICAN AIRLINES ASSOCIATION

*Association des Compagnies Aériennes
Africaines*

AAR 145

(AFRICAN AVIATION REQUIREMENTS)

Approved Maintenance Organisations

***AFRICAN
AVIATION
REQUIREMENTS
AAR - 145
Approved Maintenance Organisations***

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AAR 145.03 INTRODUCTION

This document entitled African Aviation Requirements (AAR-145) document prescribes the requirements essential for the issuance of possible approvals by appropriate authorities for maintenance organisations undertaking maintenance of aircraft and aircraft components.

AAR 145 has been developed, consistent with the Joint Aviation Requirements (JAR 145) and the Federal Aviation Requirements (FAR Part 145 respectively) and will be updated and revised to keep abreast with development in the JAR 145 and FAR Part 145 and other international requirements. It prescribes the minimum aircraft maintenance standards to be complied with thus assisting interested maintenance organisations within African countries gear themselves towards setting up acceptable maintenance organisations, systems and work practices. The final result is to ensure that an acceptable safety standard is achieved and maintained within these organisations should the essential requirements be met.

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AAR 145.04 DEFINITIONS

For the purpose of this document the following expressions shall apply

"Accountable Manager" means the manager who has corporate authority for ensuring that all maintenance required by the aircraft operator can be financed and carried out to the standard required by the Authority. The Accountable Manager may delegate in writing to another person in the organisation, such person then becoming the Accountable Manager for the purpose of this AAR- 145.

"Aircraft" means an aeroplane, helicopter or airship.

"Aircraft component" means any component part of an aircraft up to and including a complete power plant and/or any operational/emergency equipment.

"AMO" Aircraft Maintenance Organisation.

"Approved by the Authority" means approved by the Authority directly or in accordance with a procedure approved by the Authority.

"Approved standard" means a manufacturing/design/maintenance/quality standard approved by the Authority.

"Airworthiness data" means any information necessary to ensure that the aircraft or aircraft component can be maintained in a condition such that airworthiness of the aircraft, or serviceability of operational and emergency equipment as appropriate, is assured.

"Authority" means The regulatory body of an African state or a regulatory body mandated by a group of African states being referred as national aviation authority or civil aviation authority.

"Certifying staff" means those personnel who are authorised by the approved maintenance organisation in accordance with a procedure acceptable to the Authority to certify aircraft or aircraft components for release to service.

"Commercial Air Transport" means the carriage of Passengers/Cargo/Mail for remuneration.

"Inspection" means the examination of an aircraft/aircraft component to establish conformity with an approved standard.

"Maintenance" means any one or combination of overhaul, repair, inspection, replacement, modification or defect rectification of an aircraft/aircraft component conducted on the line or during hangar visits.

NOTE: The scope of maintenance work implied in this document, in no way includes the local manufacture of parts to be used for any repair work or otherwise.

"Organisation" means an organisation registered as a legal entity. Such an organisation may conduct business from more than one address and may hold more than one AAR-145 approvals.

"Overhaul" means the restoration of an aircraft/aircraft component by inspection and replacement in conformity with an approved standard to extend the operational life.

"Pre-flight inspection" means the inspection carried out before flight to ensure that the aircraft is fit for the intended flight. It does not include defect rectification.

"Repair" means the restoration of an aircraft/aircraft component to a serviceable condition in conformity with an approved standard.

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AAR 145.10 APPLICABILITY

- (a) This document prescribes the following
1. The requirements for issuing a licence for the maintenance and repair of aircraft, engines and aircraft and/or engine components to an Aircraft Maintenance Organisation (AMO) .
 2. The general operating rules for aircraft maintenance organisations where aircraft are registered within the African countries.
- (b) No aircraft maintenance organisation may perform any maintenance on an aircraft and aircraft components used for Commercial Air Transportation greater than 5700 kg unless:
1. Approved in accordance with the AAR 145 requirements or;
 2. Working under a quality control system of an AAR 145 approved organisation.
- (c) In respect to aircraft maintenance organisations established within Africa, such organisation may be granted approval when it is in compliance with the requirements of AAR 145. However, in respect to non-African organisations located outside the continent, such approval may only be granted or not upon the following conditions
1. The authority deems it necessary to grant an approval to perform maintenance on equipment registered in its territory
 2. An agreement or a memorandum of understanding is entered into which deals with mutual recognition (based on equivalence of safety standards level) between the African authority and the concerned authority outside Africa.

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AAR 145.15 APPLICATION AND *ISSUANCE*

(a) An application for approval as a maintenance organisation or for the amendment of such approval, shall be made substantially in the form of appendix 1, which should be completed by the Accountable Manager or his/her delegate. The following documents should accompany the application:

1. A letter of intent including a request for AAR 145 approval and the type of aircraft, engines and aircraft components for which the request approval is extended.
2. Three copies of the organisation's Maintenance Organisation Exposition.

(b) Applicants meeting the above conditions and the requirements of AAR 145 and who paid all the prescribed charges are entitled to a maintenance organisation approval.

(c) The validity of the maintenance approval certificate is for a period of 24 months from the date of issue.

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AAR 145.25 FACILITY REQUIREMENTS

(a) Appropriate facilities must be provided for all planned work, to ensure in particular, protection from weather elements. Specialised workshops and bays must be segregated as appropriate, to ensure that environmental and work area contamination is unlikely to occur.

1. For base maintenance of aircraft, aircraft hangars should be both available and large enough to accommodate aircraft. Where the hangar is not owned by the AAR- 145 organisation, it may be necessary to establish proof of tenancy. In addition, sufficiency of hangar space to carry out planned base maintenance will need to be demonstrated by the preparation of a projected aircraft hangar visit plan relative to the maintenance programme. The aircraft hangar visit plan should be updated on a regular basis.

2. For aircraft component maintenance, this means that aircraft component workshops should be large enough to accommodate the components on planned maintenance.

3. Protection from the weather elements relates to the normal prevailing local weather elements that are expected throughout any twelve-month period. Aircraft hangar and aircraft component workshop structures should be to a standard that prevents the ingress of rain, hail, ice, snow, wind and dust etc. Aircraft hangar and aircraft component workshop floors should be sealed to minimise dust generation.

4. For line maintenance of aircraft, hangars are not essential but it is recommended that access to hangar accommodation be demonstrated for usage during inclement weather for minor scheduled work and lengthy defect rectification.

(b) Office accommodation must be appropriate for the management of the subparagraph (a) planned work including in particular, the management of quality, planning and technical records.

1. Office accommodation means office space such that the incumbents, whether they be management, planning, technical records, quality or certifying staff, can carry out their designated tasks in a manner that contributes to good aircraft maintenance standards. In addition, aircraft maintenance staff should be provided with an area where they may study maintenance instructions and complete maintenance records in a proper manner.

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

(c) The working environment must be appropriate for the task carried out and in particular special requirements observed. Unless otherwise required by the particular task environment, the working environment must be such that the effectiveness of personnel is not impaired.

1. Hangars used to house aircraft together with office accommodation

should be such as to ensure that the working environment permits personnel to carry out work tasks in an effective manner.

2. Temperatures should be maintained such that personnel can carry out required tasks without undue discomfort.

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

4. Lighting should be such as to ensure each inspection and maintenance task can be carried out.

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

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

7. The working environment for line maintenance should be such that the particular maintenance or inspection task can be carried out without undue distraction. It therefore follows that where the working environment deteriorates to an unacceptable level in respect of temperature, moisture, hail, ice, snow, wind, light, dust/other airborne contamination, the particular maintenance or inspection tasks should be suspended until satisfactory conditions are re-established.

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

(d) Secure storage facilities must be provided for parts, equipment, tools and material. Storage conditions must be such as to provide security for serviceable parts, segregation of serviceable from unserviceable parts, and prevent deterioration and/or damage to stored items.

1. This means that secure storage facilities are required for serviceable aircraft components, whereas unserviceable aircraft components, material, tooling and equipment simply need be separately stored. It is, however, recommended that separate and secure storage facilities be provided for unserviceable components, material, equipment and tooling.

2. Storage facilities for serviceable aircraft components should be clean, dust free. Temperature and humidity must be controlled and/or monitored (as applicable), to minimise the effects of condensation. Manufacturers' standards recommendations should be followed for specific aircraft components.

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

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

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AAR 145.30 PERSONNEL REQUIREMENTS

(a) A senior person or group of persons acceptable to the Authority, whose responsibilities include ensuring that the AAR-145 approved maintenance organisation is in compliance with AAR-145 requirements, must be nominated. Such person(s) must ultimately be directly responsible to the Accountable Manager who must be acceptable to the Authority.

1. In essence however the AAR- 145 organisation should have, dependent upon the extent of approval, a base maintenance manager, a line maintenance manager, a workshop manager and a quality control manager, all of whom should report to the Accountable Manager except in small AAR- 145 organisations where any one manager may also be the Accountable Manager and the base maintenance manager, and subject to authority acceptance, he may also be the line maintenance manager or the workshop manager.

2. The Accountable Manager is responsible for ensuring that all necessary resources are available to accomplish maintenance in accordance with AAR 145.65(a) to support the organisation's AAR- 145 approval.

3. The base maintenance manager is responsible for ensuring that all maintenance required to be carried out in the hangar, including any defect rectification carried out during base maintenance, is carried out in accordance with the procedures specified in AAR 145.65(a). The base maintenance manager is also responsible for any corrective action resulting from the quality compliance monitoring of AAR 145.65(b).

4. The line maintenance manager is responsible for ensuring that all maintenance required to be carried out on the line including line defect rectification is carried out to the standards specified in AAR 145.65(a). He is also responsible for any corrective action resulting from the quality compliance monitoring of AAR 145.65(b).

5. The workshop manager is responsible for ensuring that all work on aircraft components is carried out to the standards specified in AAR 145.65(a) He is also responsible for any corrective action resulting from the quality compliance monitoring of AAR 145.65(b).

6. The quality control manager is responsible for monitoring the organisation's compliance with AAR- 145 and requesting remedial action as necessary by the base maintenance manager, line maintenance manager, workshop manager or the Accountable Manager as appropriate.

7. The organisation may adopt any title for the foregoing managerial positions but should identify to the authority the titles and persons chosen to carry out these functions.

8. The Authority therefore requires the managers specified above to be identified and their credentials submitted to the Authority. To be accepted, such managers should have relevant knowledge and satisfactory experience related to

aircraft/aircraft component maintenance as appropriate in accordance with the current National Aviation Regulations of the Country in which the AAR- 145 organisation is located.

NOTE:

Certifying staff report to any of the managers specified above depending upon which type of control the AAR-145 approved maintenance organisation uses (for example - licensed engineers/independent inspection/dual function supervisors etc.) so long as the quality compliance monitoring staff specified in AAR-145.65(b) remain independent of all.

(b) The AAR-145 approved maintenance organisation must employ sufficient personnel to plan, perform, supervise and inspect the work in accordance with the approval.

1. To demonstrate compliance the AAR- 145 organisation should have a production man-hours plan showing that it has sufficient man-hours for the work that is intended to be carried out. In the case of an AAR- 145 organisation approved for base maintenance, the plan should relate to the aircraft hangar visit plan specified under paragraph 145.25(a) 1. Man-hour plans should regularly be updated.

2. Quality monitoring compliance function man-hours should be sufficient to meet the requirement of AAR 145.65(b).

(c) The competence of personnel involved in maintenance must be established in accordance with a procedure and to a standard acceptable to the Authority.

1. The referenced procedure requires amongst others that planners, mechanics, supervisors and certifying staff are assessed for competence by "on-the-job" evaluation or by examination relevant to their particular job role within the organisation before unsupervised work is permitted.

2. To assist in the assessment of competence, job descriptions are recommended for each job role in the organisation. Basically, the assessment should establish that:-

(i) Planners are able to interpret maintenance requirements into maintenance tasks, and have an appreciation that they have no authority to deviate from the aircraft maintenance programme.

(ii) Mechanics are able to carry out maintenance tasks to any standard specified in the maintenance instructions and will notify supervisors of mistakes requiring rectification to re-establish required maintenance standards.

(iii) Supervisors are able to ensure that all required maintenance tasks are carried out and where not done or where it is evident that a particular maintenance task cannot be carried out to the maintenance instructions, then such problems will be reported to and agreed by the quality organisation.

(iv) Certifying staff are able to determine when the aircraft or aircraft component is ready to release to service and when it should not be released to service.

(d) In addition to paragraph (c) the maintenance organisation is required to establish a training programme. The programme should establish training requirements and provide procedures for conducting and documenting such training. Certifying staff must meet the qualification requirements specified by the authority and/or AFCAC.

1. Training of certifying staff may be performed by the AAR-145 approved organisation or by an institute selected by the organisation. In either case the AAR-145 organisation needs to establish the curriculum and standards for training as well as pre-qualification standards for the personnel intended for training. Pre-qualification standards are intended to ensure that the trainee has a reasonable chance of successfully completing any course.

2. It is acknowledged that training standards are difficult to define and therefore examinations should be set at the end of each training course.

3. Procedures are required for maintaining training records on each person.

4. Procedures are required for specialized training, such as non-destructive testing, plating and composite repair.

5. Initial training should cover basic engineering theory relevant to the airframe structure and systems fitted to the class of aircraft the organisation intends to maintain, specific information on the actual aircraft type on which the person is intended to become a certifying person including the impact of repairs and system/structural defects and company procedures relevant to the certifying staff's tasks. In addition, certifying staff should meet any experience requirements specified by the current National Aviation Regulations of the country in which the AAR-145 organisation is located.

6. Continuation training should cover changes in organisation procedures and changes in the standard of aircraft maintained.

e.g.

- i. New/additional aircraft engines or components.
- ii. Changes/modifications to existing aircraft, engines or components.
- iii. New or revised company/customer procedures.
- iv. New or revised regulatory authority requirements.
- v. Problem area and/or short-comings arising from feedback of problems and/or experience gained during maintenance and operational services.
- vi. Change in methods, techniques or systems employed in the various work areas.

7. The training programme should also include details of the number of personnel who will receive initial training to qualify as certifying staff over specified time periods.

8. Identify methods of training (factory schools, company training, videos, on-the-job, computer based, etc.).

9. Procedure for documenting training, to include:

- (i) Training subjects - (detailed)
- (ii) Method of training (instructor/video)
- (iii) Duration of training (start-completion)
- (iv) Location of training
- (v) Name of the instructor
- (vi) Classroom or on-the-job training
- (vii) Type of certificate or license issued
- (viii) Disposition and/or retention of each certificate

and/or license of each person.

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AAR 145.35 RECORD OF CERTIFYING PERSONNEL

(a) The AAR-145 approved maintenance organisation must maintain a record of all certifying personnel, which must include details of the scope of their authorisation.

1. The following minimum information should be kept on record 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 approval
- h. Scope of the authorisation
- i. Date of first issue of the authorisation
- j. If appropriate - expiry date of the authorisation
- k. Identification number of the authorisation

2. Persons authorised to access the record system should be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner or that such confidential records become accessible to unauthorised persons.

3. The certifying person should be given reasonable access on request to his/her own records.

4. The organisation should keep the record for at least two years after the certifying person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner. In addition, the certifying personnel should be furnished on request with a copy of their record on leaving the organisation.

AAR 145.35 RECORD OF CERTIFYING PERSONNEL

(b) Certifying personnel must be provided with evidence of the scope of their authorisation.

1. The authorisation document should be in a style that makes its scope clear to certifying personnel and any authorised person that may require to examine the document. Where codes are used to define scope, an interpretation document should be readily available.

2. Certifying personnel are not required to carry the authorisation document at all times but should produce it within a reasonable time of a request from an authorised person. Authorised persons, apart from the organisation's quality department or maintenance supervisors/managers, include the authority.

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AAR 145.40 EQUIPMENT, TOOLS AND MATERIAL

(a) The AAR-145 approved maintenance organisation must have the necessary equipment, tools and material to perform the approved scope of work.

1. Once the applicant for AAR-145 approval has determined the intended scope of approval for consideration by the authority, it will be necessary to show that all tools and equipment as specified in the manufacturers' technical documentation can be made available when needed. Where the manufacturer specifies a particular tool or equipment, then that tool or equipment should be used unless otherwise agreed in a particular case by the quality department, or the AAR-145 organisation has an agreed procedure specified in the AAR-145 organisation's exposition to manufacture such tools and equipment.

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

3. An AAR-145 organisation approved for base maintenance should have sufficient aircraft access equipment and inspection platforms/docking such that the aircraft may be properly inspected.

4. The necessary material to perform the scope of work means readily available raw material and aircraft components in accordance with the manufacturer's recommendation unless the organisation has an established spares provisioning procedure.

(b) Where necessary, tools, equipment and particularly test equipment must be controlled and calibrated to standards acceptable to the Authority at a frequency to ensure serviceability and accuracy. Records of such calibrations and the standard used must be kept by the AAR-145 approved maintenance organisation.

1. Tools, equipment and test equipment, is that tooling and equipment necessary to measure/calibrate or test an aircraft/aircraft system/aircraft component to an approved standard.

2. The control of these tools and equipment requires that the organisation has a procedure to inspect/service and, where appropriate, calibrate such items on a regular basis and indicate to users that the item is within any inspection or service or calibration time-limit.

A clear system of labelling all tooling, equipment and test equipment is therefore necessary giving information on when the next inspection or service or calibration is due and if the item is unserviceable for any other reason where it may not be obvious. A register should be maintained for all precision tooling and equipment together with a record of calibrations and standards used.

3. Inspection, service or calibration on a regular basis should be in accordance with the equipment manufacturers' instructions except where the AAR-145 organisation can show by results that a different time period is appropriate in a

particular case.

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AAR 145.45 AIRWORTHINESS DATA

(a) The AAR-145 approved maintenance organisation must be in receipt of all necessary airworthiness data from the authority, the aircraft/aircraft component manufacturers and any other approved organisation, as appropriate to support the work performed.

1. The Authority may classify data from another authority or organisation as mandatory and may require the AAR-145 approved maintenance organisation to hold such data.

2. This primarily requires the AAR-145 approved maintenance organisation to hold copies of any maintenance related document issued by the authority, the type certificate holder or other appropriate design organisation and any referenced equipment information. Referenced means that identified by the type certificate holder. Some examples of the maintenance-related documents are AAR-145, airworthiness directives, manufacturers' service letters, service instructions, modification leaflets, aircraft maintenance programme, NDT manual etc.

3. AAR 145 approved maintenance organisation may be approved as an aeroplane maintenance organisation (class rating A), engine maintenance organisation (class Rating B), organisation component maintenance organisation (class rating C) or a maintenance organisation for specialised services (class rating D). Annexe 2 describes the above classification. Following airworthiness data requirements are set up based on the above class ratings.

4. In addition to subparagraph (1), a AAR-145 approved maintenance organisation with an approval class rating in category B - Engines/APU's, should hold the following minimum approved data where published in respect of the engine/APU's specified in the approval schedule or associated capability list; The engine/APU maintenance and repair manual, service bulletins, service letters, modification leaflets, NDT manual, parts catalogue and any other specific document issued by the type certificate holder as approved data, except that in the case of operator or customer provided approved data it is not necessary to hold such data when the contract has finished other than the need to comply with AAR-145.55(c).

5. In addition of subparagraph (1), an AAR-145 approved maintenance organisation with an approval class rating in category C - Components other than complete engines / APU's, should hold the following minimum approved data where published in respect of the components specified in the approval schedule or associated capability list; the vendor maintenance and repair manual plus any document issued by the type certificate holder as approved data on whose product the component may be fitted, except that in the case of operator or customer provided approved data it is not necessary to hold such data when the contract has finished other than the need to comply with AAR-145.55(c).

6. An AAR-145 approved maintenance organisation only approved in class

rating category D - Specialised services, should hold the following minimum approved data where published in respect of the particular specialised service specified in the approval schedule; AAR except that in the case of operator or customer provided approved data it is not necessary to hold such data when the contract has finished other than the need to comply with AAR-145.55(c).

(b) Where the AAR-145 approved maintenance organisation produces its own airworthiness data additional to that specified in paragraph (a) such additional airworthiness data must be produced in accordance with a procedure acceptable to the Authority.

NOTE:

Until the implementation of applicable requirements the design of modifications and repairs should continue in accordance with the national aviation regulations of the country in which the AAR-145 organisation is located.

(c) All airworthiness data must be kept up to date and made available to all personnel who need access to such data to perform their duties.

1. To keep data up to date a procedure should be set up to monitor the amendment status of all data and maintain a check that all amendments are being received by being a subscriber to any document amendment scheme.

2. Data being made available to personnel maintaining aircraft means that the data should be available in the hangar in close proximity to the aircraft being maintained, for supervisors, mechanics and certifying staff to study.

3. Where computer systems are used, the number of computer terminals should be sufficient in relation to the size of the work programme to enable easy access, unless the computer system can produce paper copies. Where microfilm or microfiche reader/printers are used, a similar requirement is applicable.

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AAR 145.50 CERTIFICATION OF MAINTENANCE

(a) A certificate of release to service must be issued by appropriately authorised certifying staff when satisfied that all required maintenance of the aircraft or aircraft component has been properly carried out by the AAR-145 approved maintenance organisation in accordance with the procedures specified in the AAR 145.70 maintenance organisation exposition.

NOTE:

An aircraft component which has been maintained off the aircraft requires the issue of a certificate of release to service for such maintenance and another certificate of release to service in regard to being installed properly on the aircraft when such action occurs.

1. A certificate of release to service is necessary before flight at the completion of any package of maintenance scheduled by the approved aircraft maintenance programme on the aircraft, whether such maintenance took place as base or line maintenance. Only in exceptional cases may scheduled maintenance be deferred and then only in accordance with procedures specified in the AAR-145 approved maintenance organisation exposition.

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

3. A certificate of release to service is necessary at the completion of any maintenance on an aircraft component whilst off the aircraft.

(b) A certificate of release to service must contain basic details of the maintenance carried out, the date such maintenance was completed and the identity including authorisation reference of the AAR-145 approved maintenance organisation and certifying staff issuing such a certificate.

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

"Certifies that the work specified was carried out in accordance with the airworthiness regulations of AAR-145 and in respect to that work the aircraft/aircraft component is considered ready for release to service".

AAR 145.50 CERTIFICATION OF MAINTENANCE

2. The certificate of release to service should relate to the task specified in the manufacturer's or operator's or AAR-145 approved maintenance organisations instruction or the aircraft maintenance programme which itself may cross-refer to a manufacturer's / operator's / AAR-145 approved maintenance organisation instructions in a maintenance manual, service bulletin etc.

3. Where such instructions include a requirement to ensure a dimension or test figure is within a specific tolerance as opposed to a general tolerance, the dimension or test figure should be recorded unless the instruction permits the use of GO/NO GO gauges. It is not normally sufficient to state that the dimension or the test figure is within tolerance.

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

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

6. The person issuing the release to service should use his full signature and preferably a certification stamp.

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AAR 145.55 MAINTENANCE RECORDS

(a) The AAR-145 approved maintenance organisation must record all details of work carried out in a form acceptable to the Authority.

1. Properly executed and retained records provide owners, operators and maintenance personnel with information essential in controlling unscheduled and scheduled maintenance, and trouble shooting to eliminate the need for re-inspection and rework to establish airworthiness. Only records necessary to prove all requirements have been met for issuance of the release to service including sub-contractor's release documents should be retained.

2. Some gas turbine engines are assembled from modules and a true total time in service for a total engine is not kept. When owners and operators wish to take advantage of the modular design, then total time in service and maintenance records for each module is to be maintained. The maintenance records as specified are to be kept with the module and should show compliance with any mandatory requirements pertaining to that module.

3. Reconstruction of lost or destroyed records can be done by reference to other records which reflect the time in service, research of records maintained by repair facilities and reference to records maintained by individual mechanics etc. When this reference has been done and the record is still incomplete, the owner/operator may make a statement in the new record describing the loss and establishing the time in service based on the research and the best estimate of time in service. The reconstructed records should be submitted to the authority for acceptance.

NOTE:

Additional maintenance may be required.

4. The maintenance record can be either a paper or computer system or any combination of both.

5. Paper systems should use robust material, which can withstand normal handling and filing. The record should remain legible throughout the required retention period.

6. Computer systems may be used to control maintenance and/or record details of maintenance work carried out. Computer systems used for maintenance should have at least one backup system, which should be updated at least within 24 hours of any maintenance. Each terminal is required to contain programme safeguards against the ability of unauthorised personnel to alter the database

(b) The AAR-145 approved maintenance organisation must provide a copy of each certificate of release to service to the aircraft operator, together with a copy of any specific airworthiness data used for repairs/modifications carried out. A self-explanatory paragraph that requires the AAR-145 organisation to give the operator

the certificate of release to service including basic details of maintenance carried out, whereas AAR 145-55(c) requires the AAR-145 organisation to retain the record of all maintenance.

(c) The AAR-145 approved maintenance organisation must retain a copy of all detailed maintenance records and any associated airworthiness data for two years from the date the aircraft or aircraft component to which the work relates was released from the AAR-145 approved maintenance organisation.

NOTE:

Where an aircraft operator contracts an AAR-145 approved maintenance organisation to keep the aircraft operator's certificates of release to service and any associated airworthiness data, the retention period will be that required by the operator and not that specified in AAR 145.55(c).

1. The records should be stored in a safe way with regard to fire, flood and theft.

2. Computer back-up discs, tapes etc., should be stored in a different location from that containing the working discs, tapes etc., in an environment that ensures they remain in good condition.

3. Where an AAR-145 organisation terminates its operation, all retained maintenance records covering the last two years should be distributed to the last owner/customer of the respective aircraft or component. If it is impossible to trace the owner/customer, the maintenance records should be stored as required by the Authority.

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AAR 145.60 REPORTING OF UN-AIRWORTHY CONDITIONS

- a) The AAR-145 approved maintenance organisation must report to the respective national aviation authority of the country concerned and the aircraft design organisation any condition identified by the AAR-145 approved maintenance organisation of the aircraft or aircraft component that could seriously hazard the aircraft.
- b) The reports must be on a form and in a manner prescribed by the National Aviation Authority of the country concerned.
- c) The reports must be forwarded as soon as practicable but in any case within 72 hours of the condition being made known to the AAR-145 maintenance organisation. In respect of the AAR-145 maintenance organisation, a condition that could seriously hazard the aircraft is normally limited to:
 - (1) Serious cracks, permanent deformation, burning or serious corrosion found during scheduled maintenance of the aircraft or engine or propeller or helicopter rotor system.
 - (2) Failure of any emergency system during scheduled testing.

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AAR 145.65 MAINTENANCE PROCEDURES, QUALITY ASSURANCE AND QUALITY CONTROL SYSTEMS

(a) The AAR-145 approved maintenance organisation must establish procedures acceptable to the Authority to ensure good maintenance practices and compliance with all relevant requirements in this AAR-145 such that aircraft and aircraft components may be released to service in accordance with AAR 145.50.

1. The maintenance procedures should cover all aspects of carrying out the maintenance activity and in reality lay down the standards to which the AAR-145 approved maintenance organisation intends to work. The standards of aircraft/aircraft components manufacturers as well as those of the aircraft operators must be taken into account.

2. The maintenance procedures should address AAR 145.25 to 145.60 inclusive and the limitations of AAR 145.75 to 145.90 inclusive. (The Appendix 3 example exposition contains typical procedures that are to be addressed).

(b) The AAR-145 approved maintenance organisation must establish an independent quality assurance system to monitor compliance with and adequacy of the procedures to ensure good maintenance practices and airworthy aircraft and aircraft components. Compliance monitoring must include a feedback system to the person or group of persons specified in AAR 145.30(a) and ultimately to the Accountable Manager to ensure, as necessary, corrective action. Such systems must be acceptable to the Authority.

1. The quality assurance system is in fact an independent system under the supervision of the AAR 145.30(a) quality manager looking at the AAR 145.65(a) maintenance procedures.

2. The authority expects the quality assurance system to review all maintenance procedures as described in the maintenance organisation exposition in accordance with an approved programme. The quality assurance system should show when audits are due, when completed and establish a system of audit reports, which can be seen by visiting authorities on request. The audit system should clearly establish a means by which audit reports containing observations about non-compliance or poor standards can be actioned. The means ultimately should lead to the Accountable Manager.

AAR 145.65 MAINTENANCE PROCEDURES, QUALITY ASSURANCE AND QUALITY CONTROL SYSTEMS

(c) In addition, the AAR-145 approved maintenance organisation must establish a quality control system to monitor processes which includes required inspections at various stages of the process to determine the acceptability of the product.

(d) Small organisations may subcontract the independent audit procedure to another AAR 145 approved maintenance organisation.

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AAR 145.70 MAINTENANCE ORGANISATION EXPOSITION

(a) The AAR-145 approved maintenance organisation must provide a maintenance organisation exposition for use by the AAR-145 approved maintenance organisation, containing the following information:

(1) A statement signed by the Accountable Manager confirming that the maintenance organisation exposition and any associated manuals defines the AAR-145 approved maintenance organisation's compliance with AAR-145 and will be complied with at all times.

(2) The title(s) and name(s) of the senior person(s) accepted by the Authority in accordance with AAR-145.30(a).

(3) The duties and responsibilities of the senior person(s) specified in sub-paragraph (2) including matters on which they may deal directly with the Authority on behalf of the AAR-145 approved maintenance organisation.

(4) An organisation chart showing associated chains of responsibility of the senior person(s) specified in sub-paragraph (2).

(5) A list of certifying staff.

(6) A general description of manpower resources.

(7) A general description of the facilities located at each address specified in the AAR-145 approved maintenance organisation's approval certificate.

(8) A specification of the AAR-145 approved maintenance organisation's scope of work relevant to the extent of approval.

NOTE: Refer to appendix 3 for an example of a typical maintenance organisation exposition.

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AAR 145.75 PRIVILEGES OF THE APPROVED MAINTENANCE ORGANISATION

(a) The AAR-145 approved maintenance organisation may only carry out the following tasks as permitted by and in accordance with the AAR-145 approved maintenance organisation exposition.

Maintain any aircraft or aircraft component for which it has been granted approval by a National Aviation Authority of the country concerned at the locations identified in the approval certificate.

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AAR 145.80 LIMITATIONS OF THE APPROVED MAINTENANCE ORGANISATION

- (a) The AAR-145 approved maintenance organisation may only maintain aircraft or aircraft components for which it is approved when all necessary facilities, equipment, tooling, material, approved technical data and certifying personnel are available.

(See Appendix 2)

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AAR 145.85 CHANGES TO THE APPROVED MAINTENANCE ORGANISATION

(a) The AAR 145 approved maintenance organisation must notify the authority as soon as practicable of any of the following changes, to enable the Authority to determine continued compliance with the AAR 145 and to amend if necessary, the approval certificate:

- (1) The name of the organisation
- (2) The location of the organisation
- (3) Additional locations of the organisation
- (4) The Accountable Manager
- (5) Any of the senior persons specified in paragraph AAR 145.30(a).
- (6) The facilities, equipment, tools, material, procedures, work scope and certifying personnel that could affect the approval.

(b) The Authority may prescribe the conditions under which the AAR 145 approved maintenance organisation may operate during such changes unless the authority determines that the approval shall be suspended.

NOTE:

The primary purpose of this paragraph is to enable the AAR 145 organisation to remain approved if agreed by the authority during negotiations about any of the specified changes. Without this paragraph the approval would automatically be suspended in all cases.

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AAR 145.90 CONTINUED VALIDITY OF APPROVAL

(a) Unless the approval has previously been surrendered, superseded, suspended, revoked or expired by virtue of exceeding any expiry date that may be specified in the approval certificate, the continued validity of approval is dependent upon:-

(i) The AAR-145 approved maintenance organisation remaining in compliance with AAR-145 and;

(ii) The authority being granted access to the AAR-145 approved maintenance organisation to determine continued compliance with this AAR-145 and;

(iii) The payment of any charges prescribed by the authority. Failure to pay will lead to suspension, but does not necessarily render the approval invalid

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