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JAR-145: APPROVED MAINTENANCE ORGANISATIONS

Please find attached a copy of JAR-145 Amendment 5, dated 1 January 2003.

A comment/response document, detailing the comments made during consultation and the JAA's replies to those comments, is not appended for this JAR, but is available on the JAA website (www.jaa.nl).

Customers who have purchased copies of JAR-145, and who wish to receive future amendments, should ensure that they have made suitable arrangements with JAA's publisher, Information Handling Services, to whom you can direct any queries regarding the sale and distribution of JAA documents. Addresses of the worldwide IHS offices are listed on the JAA website (www.jaa.nl) and IHS's website (www.global.ihs.com).

Queries regarding the technical content of the code should be made to JAA Headquarters at the above address.

Inge R Steenberg
Assistant to Regulation Director

Joint Aviation Requirements

JAR-145

**Approved Maintenance
Organisations**

Joint Aviation Requirements

JAR-145

Approved Maintenance Organisations

Amendment 5
1 January 2003

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The members of the Joint Aviation Authorities Committee are representatives of the Civil Aviation Authorities of the countries that have signed the 'Arrangements Concerning the Development and the Acceptance of Joint Aviation Requirements'. A list of these countries is kept by European Civil Aviation Conference, 3 bis Villa Emile Bergerat, 92522 NEUILLY SUR SEINE Cedex, France.*

Further printed copies of the Joint Aviation Authorities Documents can be purchased from Global Engineering Documents, whose world wide offices are listed on the JAA website (www.jaa.nl) and Global website (www.global.ihs.com).

For electronic versions of Joint Aviation Authorities Documents please refer to the website of Information Handling Services (IHS) on www.ihsaviation.com, where you will find information on how to order.

Enquiries regarding the contents should be addressed to the Central JAA, Saturnusstraat 8-10, PO Box 3000, 2130 KA Hoofddorp, The Netherlands. (Fax. No. (31) (0) 23 5621714).

[* These countries are:-

Albania, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia (FYROM), France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, & United Kingdom.]

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FOREWORD

- 1 The Civil Aviation Authorities of certain European countries have agreed common comprehensive and detailed aviation requirements (referred to as the Joint Aviation Requirements (JAR)) with a view to minimising Type Certification problems on joint ventures, to facilitate the export and import of aviation products, and make it easier for maintenance carried out in one European country to be accepted by the Civil Aviation Authority in another European country.
- 2 The JAR are recognised by the Civil Aviation Authorities of participating countries as an acceptable basis for showing compliance with their national airworthiness codes.
- 3 FAR Parts 43 and 145 of the Federal Aviation Administration of the United States of America have been selected to provide the format, and where appropriate content, of the JAR for Approved Maintenance Organisations (JAR-145).

Appendix 8 provides information relating to which JAR-145 paragraph contains the intent of the relevant FAR Parts 43/145 paragraph and vice versa.
- 4 JAR-145 has been issued with no National Variants and as a result in several areas does not contain the detailed compliance information which some Civil Aviation Authorities and Industry organisations would like to see. It was agreed by the authors of this JAR-145 that it should be applied in practice and the lessons learnt embodied in future amendments. The Civil Aviation Authorities of the JAA are therefore committed to early amendment in the light of experience.
- 5 Future development of the requirements for this JAR including the Paragraph 4 commitment, will be in accordance with the agreed amendment procedures. Broadly, these procedures are such that amendment of JAR-145 can be proposed by the Civil Aviation Authority of any of the participating countries and by any organisation represented on the Joint Steering Assembly.
- 6 The Civil Aviation Authorities have agreed they should not unilaterally initiate amendment of their national codes without having made a proposal for amendment of the JAR-145 in accordance with the agreed procedure.
- [7 Amendments to the text in this JAR-145 are issued as Replacement pages. These show an effective date and have the same status and applicability as JAR-145 from that date.]
- 8 New, amended and corrected text is enclosed within heavy brackets.
- 9 The remainder of the text in this JAR makes reference to JAA full member Authorities. This is intended to reflect the fact that whilst all the Civil Aviation Authorities subscribe to the concept of common JARs etc., only the JAA full member Authorities have agreed mutual recognition of certificates, licences and approvals on the basis of standardisation audits. Nothing however prevents a JAA candidate member Authority from issuing a certificate, licence or approval on the basis of a JAR even though it may not be mutually recognised by the JAA full member Authorities.
- [10 Following amended paragraphs, a summary of the amendments made to the paragraph is indicated in square brackets. This text has no regulatory status.
11. Comment/Response Documents developed following Notice of Proposed Amendment (NPA) consultation have been produced by the JAA and are published on JAA's website (www.jaa.nl). Readers can also apply to Central JAA for copies of specific Comment/Response Documents, as required.]

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JOINT AVIATION REQUIREMENTS
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PREAMBLES

This JAR-145 was issued on 30 July 1991 and became effective on 1 January 1992.
The preambles are intended to be a summarised record of the main changes introduced by each amendment of JAR-145.

Issued 30 July 1991

New requirement for maintenance organisations involved in maintenance of aircraft operated for commercial air transport with an effectivity date of 1 January 1992.

Amendment 145/92/1 (NPA 145-1) 1 January 1992

Changed the effectivity date of JAR 145.1 to 1 January 1994 and introduced a new JAR 145.50c which permits aircraft components maintained prior to 1 January 1994 by non JAR-145 organisations to be fitted to aircraft at any time prior to 1 January 1997.

Amendment 145/94/1 (NPA 145-2) 10 March 1994

Deleted the reference to Transport (Passenger) and Transport (Cargo) Certificates of Airworthiness from JAR 145.1.

Added a definition for 'organisation' to JAR 145.5.

Added new JAR 145.10(d), (e) and (f) which permits the possibility of maintenance under maintenance bilateral conditions.

Amended JAR 145.75(c) to permit line maintenance of aircraft at any location.

Other minor changes also incorporated.

Amendment 145/94/2 (NPA 145-3) 29 April 1994

Changed the effectivity date of JAR 145.1 to 30 June 1994, 30 September 1994 and 31 December 1994 dependant upon maintenance activity via a new paragraph JAR 145.3

JAR 145.50(c) which addresses components maintained prior to the JAR 145.1 effective dates amended to reflect the new JAR 145.3.

Other minor changes also incorporated.

Change 1 (incl. NPA 145-4) 4 August 1995

Change 1 incorporated amendments 145/92/1, 145/94/1, 145/94/2 and NPA 145-4 into JAR-145. In respect of Change 1 the following elements of NPA 145-4 have been incorporated:

Advisory Circulars Joint (ACJs) have been replaced by Acceptable Means of Compliance (AMCs) and Interpretative/Explanatory Material (IEMs).

Section 2 Appendix 1 amended to include information on the JAR-145 approval class ratings and added a new category C20 for Structural Components.

New paragraphs IEM 145.70(a)(9) and (10) introduces an example accountable managers commitment statement and a reminder that changes of accountable manager mean a new signature to the statement.

Section 2 Appendix 3 amended to include issue 3 of JAA Form One which aligns it with the equivalent FAA Form 8130-3 and changes the associated instructions for use and completion of the JAA Form One.

A new maintenance status namely 'retreaded' for aircraft tyres also incorporated.

JAR 145.10(f) and IEM 145.10(f) which address the possibility of working in accordance with a maintenance bilateral before the bilateral is signed amended to improve the understanding of original intent. The principal

JAR-145

PREAMBLES (continued)

improvement to the text covers the intent that any proposed maintenance bilateral must be agreed by the JAA for it to be recognised by other JAA Authorities.

Other minor changes also incorporated.

The effectivity date for these changes is as stated for Change 1 except the revised JAA Form One which became effective on 01 July 1996 except that it may be used before this date on a voluntary basis.

Change 2 (including NPA 145-5 and NPA-6)

10 July 1998

Change 2 incorporated Change 1, NPA 145-5 and NPA 145-6 into JAR-145. In respect of Change 2 the following elements of NPA 145-5 and NPA 145-6 have been incorporated:

NPA 145-5; This amendment satisfied a European Commission concern that JAR-145 should not make a direct reference to international maintenance agreements. Therefore JAR 145.10(d), (e) and (f) were deleted and JAR 145.10(c) amended to include the notion that JAR-145 could recognise foreign approvals if equivalency with JAR-145 could be established.

NPA 145-6; This was a significant amendment to JAR-145. The main elements were the introduction of a standard and limitation regarding sub-contracting - JAR 145.1(e) and Appendix 6 of Section 2 refers, the introduction of more detail on quality systems with a particular reference to small JAR-145 organisations - JAR 145.65(b) and Appendix 5 of Section 2 refers, more detail on approved data - JAR 145.45 refers, more detail on continuation training - AMC 145.30(d) refers, the introduction of a new JAR 145.100 addressing the revocation of JAR-145 approval certificates and the clarification of what an 'organisation' is in JAR 145.5.

Other minor changes also incorporated.

For the record, 3 other significant amendments proposed in NPA 145-6 were withdrawn from the finally adopted Amendment due to NPA comments. They were proposals to address, the design of minor repairs/modifications, the standards under which a JAR-145 maintenance organisation could manufacture minor parts under repair/modification schemes and the standards to qualify non destructive inspection personnel. These amendments will be subjected to further review as a matter of urgency due to the fact that many JAR-145 maintenance organisations utilise the concepts without causing safety concerns and would prefer a European level playing field on the issues.

Amendment 3 (including amendments 145/99/1 (NPA 145-7) and NPA-8))

1 April 2001

Amendment 3 incorporated Change 2, amendment 145/99/1 (NPA 145-7) and NPA 145-8 into JAR-145.

Amendment 145/99/1 (NPA 145-7); This amendment introduced via amended JAR-145.30 (d) the need for compliance with JAR-66 for those organisations maintaining aircraft 5700kg and above. The amendment also permitted via JAR-145.30 (g) some specific deviations from full compliance with JAR-66. Also included via amended JAR-145.35 and new AMC 145.30 (d) (1) are more focussed JAR-145 Certification Authorisation procedures and the tasks that may be carried out by the new JAR-66 category A Certifying Staff.

NPA 145-8: This amendment covers the following issues. Improvements to the quality system and assessing manpower needs via various JAR/AMC paragraphs. Introduces a European standard qualification for non-destructive test/inspection personnel via amended JAR-145.30 (e). Makes provision for a JAR-145 organisation to be approved in accordance with JAR-21 to design minor repairs via amended JAR-145.45 (d) and, finally, permits an aircraft to fly after a component change under specific conditions in the temporary absence of an appropriate JAA Form One via new JAR-145.50 (e).

Other minor changes also incorporated.

Amendment 4 (NPA 145-11)

01.11.01

The amendment introduces:

Changes to Section 2 Appendix 3 to include issue 4 of the Authorised Release Certificate JAA FORM ONE, and to the instructions for completion of the form. These changes follow the development of a more common format for the release certificates of JAA, FAA and Transport Canada after requests from Industry associations from all three regulatory systems.

An amendment to JAR 145.5, "*Aircraft component*" definition to link with the changes to Section 2 Appendix 3.

Minor amendments to AMC 145 50 (a) and (b).

Amendment 5

01.01.03

This amendment includes NPA 145-10 and NPA 145-12:

NPA 145-10 introduces changes to the text of JAR 145.60 and the addition of a new sub paragraph requiring an internal occurrence reporting structure to assess and extract occurrences to be reported under JAR 145.60(a).

Additional information is included in AMC 145.60 and ACJ 20X8.

NPA 145-12 includes significant changes to address human factors and safety culture. It makes a safety policy a requirement via JAR 145.65(a) and JAR 145.70(a)(2) and provides better focus on problems of inaccurate maintenance data, procedures and practices. AMC 145.65(b) has been amended to address the need for procedures to detect and rectify maintenance errors that may endanger the safe operation of an aircraft. JAR 145.47 requires a system for planning maintenance tasks taking into account resources and human performance limitations and addresses shift changeovers, JAR 145.30(e) and its associated AMC concerning the competence of maintenance personnel have also been amended to include the requirement for an understanding of the application of human factors principles.

A new Appendix 9 which includes the Maintenance Human Factors training syllabus has been introduced into Section 2.

JAR 145.5 has been amended to include definitions of "Human Factors" and "Human Performance".

Section 2 Appendix 9 includes the Maintenance Human Factors training syllabus.

JAR 145.5 is amended to include the definitions of "Human Factors Principles" and Human Performance". Both definitions are taken from the recently revised ICAO Annex 6.

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SECTION 1 – REQUIREMENTS

1 GENERAL

This Section 1 contains the Requirements for Approved Maintenance Organisations.

2 PRESENTATION

[2.1 The requirements of JAR-145 are presented in two columns on loose pages, each page being identified by the date of issue and the Amendment number under which it is amended or reissued.]

2.2 Sub-headings are in italic typeface.

2.3 Explanatory Notes not forming part of the requirements appear in smaller typeface.

2.4 New, amended and corrected text is enclosed within heavy brackets.

[2.5 Following amended paragraphs, a summary of the amendments made to the paragraph is indicated in square brackets. This text has no regulatory status.]

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JAR 145.1 General

(See AMC & IEM 145.1)

(a) No aircraft when used for Commercial Air Transport may fly unless a certificate of release to service has been issued by an organisation for maintenance carried out on the aircraft or an aircraft component intended for fitment to such an aircraft.

(b) No organisation may certify for release to service an aircraft used for Commercial Air Transport unless either approved in accordance with this JAR-145 or accepted in accordance with the JAR-145.10(c) alternative. Except where stated otherwise in subparagraph (e), no organisation may maintain such an aircraft unless either appropriately approved in accordance with this JAR-145 or accepted in accordance with the JAR 145.10(c) alternative, or working under the quality system of an appropriately approved or accepted JAR-145 maintenance organisation.

NOTE: A JAR-145 approval is not required for the pre-flight inspection.

(c) No organisation may certify for release to service an aircraft component intended for fitment to an aircraft used for Commercial Air Transport unless either approved in accordance with this JAR-145 or accepted in accordance with the JAR-145.10(c) alternative. Except where stated otherwise in subparagraph (e), no organisation may maintain such an aircraft component unless either appropriately approved in accordance with this JAR-145 or accepted in accordance with the JAR-145.10(c) alternative, or working under the quality system of an appropriately approved or accepted JAR-145 maintenance organisation.

(d) A maintenance organisation approval may be granted for maintenance activity varying from that for an aircraft component to that for a complete aircraft or any combination thereof.

(e) An organisation working under the quality system of either an appropriately approved JAR-145 maintenance organisation or an organisation accepted in accordance the JAR-145.10(c) alternative is limited to the work scope permitted by the JAR-145.65 (b) procedures and may not carry out a base maintenance check of an aircraft or a complete workshop maintenance check or overhaul of an engine or engine module.

[Ch 1, 4.8.95; Ch 2, 10.7.98; Amdt. 3, 01.04.01]

JAR 145.3 Effectivity

(See IEM 145.3)

(a) This JAR-145 was first issued on 30 July 1991 and became effective on 1 January 1992 with the exception of JAR-145.1 which became effective in accordance with the following schedule.

(1) Organisations that carry out base maintenance and certify release to service of aeroplanes/ airships above 5 700 kg maximum certificated take off weight must be in compliance with JAR-145.1 (b) after 30 June 1994.

(2) Organisations that carry out line maintenance and certify release to service of aeroplanes/ airships above 5 700 kg maximum certificated take off weight must be in compliance with JAR-145.1 (b) after 30 September 1994.

(3) Organisations that carry out maintenance and certify release to service of engines must be in compliance with JAR-145.1 (c) after 30 September 1994.

(4) Organisations that carry out maintenance and certify release to service of aeroplanes/airships up to and including 5 700 kg maximum certificated take off weight and/or helicopters of any weight must be in compliance with JAR-145.1 (b) after 31 December 1994.

(5) Organisations that carry out maintenance and certify release to service of aircraft components (other than complete engines), auxiliary power units and specialised services must be in compliance with JAR-145.1 (c) after 31 December 1994.

(b) A JAR-145 Approval may be issued by the JAA full member Authority prior to the para (a) dates.

(c) Any aircraft or aircraft component that is required to be maintained in accordance with the para (a) schedule may until that time be maintained by either an organisation approved or accepted in accordance with JAR-145 or in accordance with national legislation in force prior to the para (a) schedule or a combination of both.

(d) JAR-145 approved or accepted maintenance organisations that have or intend to have maintenance carried out under their quality system by another organisation in accordance with JAR-145.1(b) or (c) must be in compliance

JAR 145.3(d) (continued)

with the limitations of JAR-145.1(e) after 10 July 2000.

(e) Organisations that carry out or intend to carry out maintenance of aircraft with a maximum take-off mass of 5 700 kg and above must be in compliance with JAR-145.30([g]) and ([j]), as appropriate, after 01 June 2001 but may choose to be partly or completely in compliance before this date.

(f) Organisations must be in compliance with JAR-145.35 as amended by amendment 145/99/1 after 01 June 2001 but may choose to be partly or completely in compliance before this date.

(g) Organisations must be in compliance with Amendment 3 to JAR-145 as specified after the stated dates, but may choose to be partly or completely in compliance before the stated dates;

(1) Amended JAR-145.30 ([f]) after 31 December 2003.

(2) All other sub-paragraphs amended by Amendment 3 to JAR-145 after 31 December 2001.

[(h) Organisations must be in compliance with Amendment 5 to JAR-145 as specified after the stated dates, but may choose to be partly or completely in compliance before the stated dates;

(1) Amended JAR 145.60 after 1 January 2004.

(2) Amended JAR-145.30 (e) after 1 July 2005.

(3) All other sub-paragraphs amended by Amendment 5 to JAR-145 after 1 September 2003.]

NOTE: Where an existing sub-paragraph has been amended, it is essential to understand that compliance with the pre-amendment text is still required until superseded by the compliance date for the amended text unless the organisation chooses to comply with the amended text before the compliance date for the amended text. Pre-amendment text should therefore be retained at least until the compliance date has been superseded.

[Ch. 1, 4.8.95; Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

JAR 145.5 Definitions

(See IEM 145.5)

For the purpose of this JAR-145 the following definitions shall apply:

'*Accountable manager*' means the manager who has corporate authority for ensuring that all maintenance required by the customer can be

JAR 145.5 (continued)

financed and carried out to the standard required by the JAA full member Authority.

'*Aircraft*' means an aeroplane, helicopter or airship.

'*Aircraft component*' means any assembly/item/component/part of an aircraft up to and including a complete powerplant and/or any operational/ emergency equipment.

'*Approved by the JAA full member Authority*' means approved by the JAA full member Authority directly or in accordance with a procedure approved by the Authority.

'*Approved standard*' means a manufacturing/design/maintenance/quality standard approved by the JAA full member Authority.

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

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

['*Human Factors*' means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration of human performance.

'*Human Performance*' means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.]

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

'*JAR-145 certification authorisation*' means the authorisation issued to certifying staff by the JAR-145 approved maintenance organisation and which specifies the fact that they may sign JAR-145.50 certificates of release to service within the limitations stated in such authorisation on behalf of the JAR-145 approved maintenance organisation.

'*Location*' means a place from which an organisation carries on activities or wishes to carry on activities for which a JAR-145 approval is required.

'*Maintenance*' means any one or combination of overhaul, repair, inspection, replacement, modification or defect rectification of an aircraft/aircraft component.

JAR 145.5 (continued)

'Maintenance 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.

'Maintenance Organisation Exposition' means the document(s) that contain the material required by JAR-145.70 to show how the organisation complies with JAR-145.

'Modification' means the alteration of an aircraft/aircraft component in conformity with an approved standard.

'Organisation' means either an organisation registered as a legal entity in any jurisdiction whether or not within the territories of the States that have joined the Joint Aviation Authorities or a natural person. Such an organisation may be located at more than one location and may hold more than one JAR-145 approval.

'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.

'Quality policy' means the overall intentions and direction of an organisation as regards quality, as approved by the accountable manager.

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

[Ch. 1,4.8.95; Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 4, 01.11.01; Amdt. 5, 01.01.03]

JAR 145.10 Applicability

(See AMC & IEM 145.10)

(a) This JAR prescribes the requirements for issuing approvals to organisations for the maintenance of aircraft and aircraft components and prescribes the general operating rules for approved maintenance organisations. The approval, when granted, will apply to the whole organisation headed by the accountable manager.

(b) An organisation which is located, in whole or in part, within the territories of the Joint Aviation Authorities full member States will be granted approval in respect of any such location within those territories when in compliance with this JAR-145.

JAR 145.10 (continued)

(c) An organisation which is located, in whole or in part, outside the territories specified in sub-paragraph (b) will only be granted approval in respect of any such location outside those territories if the JAA full member Authority is satisfied that there is a need for such approval to maintain aircraft/aircraft components at that location and when in compliance with this JAR-145. Alternatively, the JAA full member Authority may accept such an organisation on the basis of an approval granted by an Authority that is not a member or full member of the Joint Aviation Authorities subject to the organisation being in compliance with published JAA maintenance special conditions to ensure equivalence to JAR-145. The alternative accepted organisation may be required to show a need before being accepted.

[Ch. 1, 4.8.95; Ch. 2, 10.7.98]

JAR 145.15 Application and issue

(See AMC 145.15)

(a) An application for maintenance organisation approval or for the amendment of an existing maintenance organisation approval shall be made on a form and in a manner prescribed by the JAA full member Authority and submitted with the required number of copies of the maintenance organisation's exposition or amendment thereto.

(b) An applicant who meets the requirements of this JAR-145 and has paid any charges prescribed by the JAA full member Authority is entitled to a maintenance organisation approval.

[Ch. 2, 10.7.98]

JAR 145.20 Extent of approval

(See IEM 145.20)

The grant of approval is indicated by the issue of an approval certificate to the organisation by the JAA full member Authority. The approval certificate will specify the extent of approval. The JAR-145 approved maintenance organisation's exposition must specify the scope of work deemed to constitute approval.

[Ch. 2, 10.7.98]

JAR 145.25 Facility requirements

(See AMC 145.25)

(a) Facilities must be provided appropriate for all planned work, ensuring in particular,

JAR 145.25(a) (continued)

protection from the weather elements. Specialised workshops and bays must be segregated as appropriate, to ensure that environmental and work area contamination is unlikely to occur.

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

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

(d) Secure storage facilities must be provided for aircraft components, equipment, tools and material. Storage conditions must ensure segregation of serviceable aircraft components and material from unserviceable aircraft components, material, equipment and tools. The conditions of storage must be in accordance with the manufacturers instructions to prevent deterioration and damage of stored items. Access to storage facilities must be restricted to authorised personnel.

[Ch. 2, 10.7.98]

JAR 145.30 Personnel requirements

(See AMC 145.30)

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

[(b) The accountable manager is responsible for establishing and promoting the safety and quality policy specified under JAR 145.65(a) .]

[(c)] The accountable manager must nominate a sub-paragraph (a) senior person, with responsibility for monitoring the JAR 145.65(c) quality system including the associated feedback system. Such senior person must have right of direct access to the accountable manager to ensure that the accountable manager is kept properly informed on quality and compliance matters.

JAR 145.30 (continued)

[(d)] The JAR-145 approved maintenance organisation must have a maintenance man-hour plan showing that the organisation has sufficient staff to plan, perform, supervise, inspect and quality monitor the organisation in accordance with the approval. In addition the organisation must have a procedure to reassess work intended to be carried out when actual staff availability is less than the planned staffing level for any particular work shift or period.

[(e)] The competence of personnel involved in maintenance[, management] and/or quality audits must be established and controlled in accordance with a procedure and to a standard acceptable to the JAA full member Authority. [In addition to the necessary expertise related to the job function, competence must include an understanding of the application of human factors and human performance issues appropriate to that persons' function in the organisation.]

[(f)] Personnel who carry out and/or control a continued airworthiness non-destructive test of aircraft structures and/or aircraft components must be appropriately qualified for the particular non-destructive test in accordance with the JAA agreed issue of European standard EN 4179, except that the JAA full member Authority may accept an equivalent standard in the case of any JAR-145 approved / accepted maintenance organisation located outside the JAA full member States. Personnel who carry out any other specialised task must be appropriately qualified in accordance with any existing national standard recognised by the JAA full member Authority as an appropriate standard.

(1) Notwithstanding sub-paragraph [(f)], personnel qualified prior to 31 December 2003 in accordance with any national standard recognised by the JAA full member Authority may continue to carry out and/or control such non-destructive test after 31 December 2003. Any such personnel who intend to carry out and/or control a non-destructive test for which they were not qualified prior to 31 December 2003 must qualify for such non-destructive test in accordance with the JAA agreed issue of European standard EN 4179.

(2) Notwithstanding sub-paragraph [(f)], those personnel specified in subparagraph [(g)](1) and [(g)](2), qualified in JAR-66 sub-category B1 may carry out and/or control colour contrast dye penetrant tests.

JAR 145.30 (continued)

[(g)] Any JAR-145 approved maintenance organisation maintaining aircraft with a maximum take-off mass of 5 700 kg and above, except where stated otherwise in sub-paragraph [(j)] must have;

(1) In the case of aircraft line maintenance, appropriate aircraft type rated certifying staff qualified in accordance with JAR-145.35 plus JAR-66 sub-category B1 and B2. In addition such JAR-145 approved maintenance organisation may also use appropriate task trained certifying staff qualified in accordance with JAR-145.35 plus JAR-66 category A to carry out minor scheduled line maintenance and simple defect rectification. The availability of such category A certifying staff does not replace the need for JAR-66 sub-category B1 and B2 certifying staff to support the category A certifying staff except that such JAR-66 sub-category B1 and B2 staff need not always be present at the line station during minor scheduled line maintenance or simple defect rectification.

(2) In the case of aircraft base maintenance, appropriate aircraft type rated certifying staff qualified in accordance with JAR-145.35 plus JAR-66 category C. In addition such JAR-145 approved maintenance organisation must have appropriate aircraft type rated staff qualified in accordance with JAR-145.35 (b) and (e) plus JAR-66 sub-category B1 and B2 to support the category C certifying staff. The JAR-145 approved maintenance organisation must maintain a register of any such JAR-66 sub-category B1 and B2 qualified support staff.

[(h)] Reserved for certifying staff of aircraft under 5 700 kg maximum take-off mass. Until such time as JAR-66 specifies a requirement for certifying staff of aircraft under 5 700 kg maximum take-off mass, continued compliance is required with the current national aviation regulations of the JAA full member Authority that granted or proposes to grant JAR-145 approval.

[(i)] Reserved for certifying staff of aircraft components. Until such time as JAR-66 specifies a requirement for certifying staff of aircraft components, continued compliance is required with the current national aviation regulations of the JAA full member Authority that granted or proposes to grant JAR-145 approval.

[(j)] Notwithstanding sub-paragraph [(g)] the JAR-145 approved maintenance organisation may in the following circumstances use certifying staff qualified as specified in this sub-

JAR 145.30(j) (continued)

paragraph subject to compliance with the conditions stated for each circumstance;

(1) For a non-JAA State or non-JAA full member State based JAR-145 maintenance organisation approved by a JAA full member Authority, the organisation may use certifying staff qualified in accordance with the national aviation regulations of the State in which the organisation is based subject to the JAA full member Authority in conjunction with the JAA Maintenance Division being satisfied that such regulations result in a standard of qualification comparable with JAR-66. Published JAA additional conditions, where specified, will need to be satisfied to ensure equivalence.

(2) Reserved for non-JAA State based JAR-145 maintenance organisation accepted by the JAA full member Authorities in accordance with JAR-145.10(c).

(3) For limited line maintenance carried out by another organisation under the quality system of a JAA full member Authority approved JAR-145 maintenance organisation at a non-JAA State or non-JAA full member State location the organisation may use certifying staff qualified in accordance with the national aviation regulations of the State of the location, subject to the JAA full member Authority in conjunction with the JAA Maintenance Division being satisfied that such regulations result in a standard of qualification comparable with JAR-66. Published JAA additional conditions, where specified, will need to be satisfied to ensure equivalence.

(4) For a repetitive pre-flight airworthiness directive which specifically states that the flight crew may carry out such airworthiness directive, the JAR-145 approved maintenance organisation may issue a limited JAR-145 certification authorisation to the aircraft commander and/or the flight engineer subject to being satisfied that sufficient practical training has been carried out to ensure that such aircraft commander or flight engineer can accomplish the airworthiness directive to the required standard.

(5) For the unforeseen case of an aircraft grounded at a location not having an appropriately approved or accepted JAR-145 maintenance organisation, the JAR-145 approved or accepted maintenance organisation contracted to provide maintenance support may issue a one-off

JAR 145.30(j) (continued)

JAR-145 certification authorisation to a person with not less than 5 years maintenance experience and holding a valid ICAO aircraft maintenance licence rated for the aircraft type requiring certification subject to the JAR-145 maintenance organisation obtaining and holding on file evidence of the experience and the licence. All such cases must be reported to the JAA full member Authority within 7 days of the issuance of such certification authorisation. The JAA full member Authority will require any such maintenance that could affect flight safety to be rechecked by the contracted JAR-145 approved or accepted maintenance organisation.

For the purposes of this sub-paragraph unforeseen means that the aircraft grounding could not reasonable have been predicted by the operator because the defect was unexpected due to being part of a hitherto reliable system.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

JAR 145.35 Certifying staff
(See AMC 145.35)

(a) In addition to the appropriate JAR-145.30 [(g)] to [(j)] sub-paragraph(s), the JAR-145 approved maintenance organisation must ensure that certifying staff have an adequate understanding of the relevant aircraft and/or aircraft component(s) to be maintained together with the associated organisation procedures before the issue or re-issue of the JAR-145 certification authorisation. Relevant aircraft and/or aircraft component(s) means those aircraft and/or aircraft component(s) specified in the particular JAR-145 certification authorisation.

(b) The JAR-145 approved maintenance organisation must ensure that all aircraft release certifying staff are involved in at least 6 months of actual aircraft maintenance experience in any 2 year period. For the purpose of this sub-paragraph involved in actual aircraft maintenance means the person has worked in an aircraft maintenance environment and has either exercised the privileges of the JAR-145 certification authorisation and/or has actually carried out maintenance on at least some of the aircraft type systems specified in the particular JAR-145 certification authorisation.

(c) The JAR-145 approved maintenance organisation must ensure that all certifying staff receive sufficient continuation training in each 2 year period to ensure that such certifying staff have up to date knowledge of relevant

JAR 145.35(c) (continued)

technology, organisation procedures and human factor issues.

(d) The JAR-145 approved maintenance organisation must establish a programme for the continuation training and a procedure to ensure compliance with the relevant sub-paragraphs of JAR-145.35 as the basis for issue of JAR-145 certification authorisations to certifying staff, plus, if applicable, a procedure to ensure compliance with JAR-66.

(e) Except for the JAR-145.30 [(j)](5) one off JAR-145 certification authorisation, all prospective certifying staff must be assessed by the JAR-145 approved maintenance organisation for their competence, qualification and capability to carry out their intended certifying duties in accordance with a procedure acceptable to the JAA full member Authority before the issue or re-issue of a JAR-145 certification authorisation.

(f) The JAR-145 approved maintenance organisation must issue a JAR-145 certification authorisation that clearly specifies the scope and limits of such authorisation to those staff that it nominates as certifying staff on behalf of the organisation when satisfied that such staff are in compliance with sub-paragraphs (a), (c) and (e) plus (b) as applicable. Continued validity of the JAR-145 certification authorisation is dependent upon continued compliance with sub-paragraphs (a) and (c) plus (b) as applicable.

(g) The manager or person responsible for the quality system must also remain responsible on behalf of JAR-145 approved maintenance organisation for issuing JAR-145 certification authorisations to certifying staff. Such manager or person may nominate other persons to actually issue the JAR-145 certification authorisations in accordance with a procedure acceptable to the JAA full member Authority.

(h) The JAR-145 approved maintenance organisation must maintain a record of all certifying staff which must include details of any JAR-66 aircraft maintenance licence held, all training completed and the scope of their JAR-145 certification authorisation. The record must include those with limited or one-off JAR-145 certification authorisations.

(i) Certifying staff must be provided with a copy of their JAR-145 certification authorisation. The copy may be in either a documented or electronic format.

JAR 145.35 (continued)

(j) Certifying staff must be able to produce their JAR-145 certification authorisation to any authorised person within a reasonable time.

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

JAR 145.40 Equipment, tools and material

(See AMC 145.40)

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

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

JAR 145.45 Maintenance data

(See AMC 145.45)

(a) The JAR-145 approved maintenance organisation must hold and use applicable current maintenance data in the performance of maintenance including modifications and repairs. Applicable means relevant to any aircraft, aircraft component or process specified in the JAR-145 approved maintenance organisation's approval class rating schedule and any associated capability list.

(b) For the purposes of JAR-145 applicable maintenance data is;

(1) Any applicable requirement, procedure, airworthiness directive, operational directive or information issued by the JAA or JAA full member Authority.

(2) Any applicable airworthiness directive issued by a non-JAA Authority or non-JAA full member Authority where said Authority is the original type certificate Authority.

(3) Any applicable data, such as but not limited to, maintenance and repair manuals, issued by an organisation under the approval of the JAA full member Authority including type certificate and supplementary type certificate holders and any other organisation approved to publish such data by the said Authority.

JAR 145.45(b) (continued)

(4) Unless specified otherwise by the JAA full member Authority, any applicable data, such as but not limited to, maintenance and repair manuals, issued by an organisation under the approval or authority of a non JAA Authority or non-JAA full member Authority where said Authority is the original type certificate Authority.

(5) Any applicable standard, such as but not limited to, maintenance standard practises issued by any Authority, institute or organisation and recognised by the JAA full member Authority as a good standard for maintenance.

(6) Any applicable data issued in accordance with sub-paragraph [(d)].

[(c) The JAR-145 approved maintenance organisation must establish procedures that ensure that if found, any inaccurate, incomplete or ambiguous procedures, practices, information or maintenance instructions contained in the maintenance data used by maintenance personnel is recorded and notified to the author of the maintenance data.]

[(d)] The JAR-145 approved maintenance organisation may only modify maintenance instructions in accordance with a procedure specified in the maintenance organisation's exposition where it can be shown that such modified maintenance instruction results in equivalent or improved maintenance standards and subject to the type certificate holder being informed. Maintenance instructions for the purpose of this sub-paragraph means an instruction on how to carry out the particular maintenance task. The JAR-145 approved maintenance organisation may not carry out the engineering design of repairs and modifications under this sub-paragraph [(d)].

[(e)] A JAR-145 approved maintenance organisation must be appropriately approved as required by JAR-21 Subpart M to classify repairs as minor or major and to approve minor repair design data. Such approval is not required for a JAR-145 approved maintenance organisation that only carries out repairs in accordance with the approved type certificate holders published repair data or any other JAA full member Authority approved repair data. Whether approved or not in accordance with this sub-paragraph the JAR-145 approved maintenance organisation must establish a procedure to ensure that appropriate action is taken in the case of damage assessment and the need to use only approved repair data.

[(f)] Except where stated otherwise in sub-paragraph [(f)](1), the JAR-145 approved maintenance organisation must provide a common workcard or worksheet system for use throughout relevant parts of the organisation and must either transcribe accurately the maintenance data contained in sub-paragraphs (b), [(d)] and [(e)] onto such workcards or worksheets or make precise reference to the particular maintenance task(s) contained in such maintenance data. Workcards and worksheets may be computer generated and held on an electronic data base subject to both adequate safeguards against unauthorised alteration and a back-up electronic data base which is updated within 24 hours of any entry made to the main electronic data base.

(1) Where the JAR-145 approved maintenance organisation provides a maintenance service to an aircraft operator who require their workcard or worksheet system to be used then such workcard or worksheet system may be used. In this case the JAR-145 approved maintenance organisation must establish a procedure to ensure correct completion of the aircraft operators workcards or worksheets.

[(g)] The JAR-145 approved maintenance organisation must ensure that all applicable maintenance data is readily available for use when required by maintenance personnel.

[(h)] The JAR-145 approved maintenance organisation must ensure that maintenance data controlled by the organisation is kept up to date. In the case of operator / customer controlled and provided maintenance data, the JAR-145 approved maintenance organisation must show that either it has written confirmation from the operator / customer that all such maintenance data is up to date or it has work orders specifying the amendment status of the maintenance data to be used or it can show that it is on the operator / customer maintenance data amendment list.

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

[JAR 145.47 Production Planning

(See AMC & IEM 145.47)

(a) The JAR 145 approved maintenance organisation must have a system appropriate to the amount and complexity of work to plan the availability of all necessary personnel, tools, equipment, material, maintenance data and facilities in order to ensure the safe completion of the maintenance work.

(b) The planning of maintenance tasks, and the organising of shifts, must take into account human performance limitations.

(c) When it is required to hand over the continuation or completion of a maintenance action for reasons of a shift or personnel changeover, relevant information must be adequately communicated between outgoing and incoming personnel in accordance with a procedure acceptable to the JAA full member Authority.]

[Amdt. 5, 01.01.03]

JAR 145.50 Certification of maintenance (See AMC 145.50)

(a) Except where stated otherwise in sub-paragraphs (d), (e) and (f) a certificate of release to service must be issued by appropriately authorised certifying staff on behalf of the JAR-145 approved maintenance organisation when satisfied that all maintenance required by the customer of the aircraft or aircraft component has been properly carried out by the JAR-145 approved maintenance organisation in accordance with the procedures specified in the JAR-145.70 maintenance organisation exposition taking into account the availability and use of the maintenance data specified in JAR-145.45.

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.

(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 approval reference of the JAR-145 approved maintenance organisation and certifying staff issuing such a certificate.

(c) Used aircraft component release certificates issued prior to the appropriate JAR 145.3 (a)(3) or (5) date by organisations not approved to JAR-145 remain valid until 1 January 2000. However, the aircraft JAR-145 approved maintenance organisation shall satisfy itself that the particular aircraft component may be fitted to the aircraft when different modifications and/or airworthiness directive standards may be applicable.

(d) Notwithstanding sub-paragraph (a) when a JAR-145 maintenance organisation approved to maintain the aircraft is unable to complete all maintenance required by the customer, being the aircraft operator, within the

JAR 145.50(d) (continued)

aircraft operators limitations, then such fact must be entered in the aircraft certificate of release to service before issue of such certificate.

(e) Notwithstanding sub-paragraph (a), when an aircraft is grounded at a location other than the main line station or main maintenance base due to the non-availability of an aircraft component with the appropriate release certificate, it is permissible to temporarily fit an aircraft component without the appropriate release certificate for a maximum of 30 flight hours or until the aircraft first returns to the main line station or main maintenance base, whichever is the sooner, subject to the aircraft operator agreement and said component having a suitable serviceable tag but otherwise in compliance with all other JAR-OPS 1 or 3 Subpart M and JAR-145 requirements. Such aircraft components must be removed by the specified time unless an appropriate release certificate has been obtained in the meantime.

(f) Notwithstanding sub-paragraphs (a), (c), (d) and (e), A certificate of release to service must not be issued in the case of any non-compliance known to the JAR-145 approved maintenance organisation which could hazard flight safety.

[Ch. 1, 4.8.95; Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

JAR 145.55 Maintenance records
(See AMC & IEM 145.55)

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

(b) The JAR-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 approved repair/modification data used for repairs/modifications carried out.

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

NOTE: Where an aircraft operator contracts a JAR-145 approved maintenance organisation to keep the aircraft operator's certificates of release to service and any associated approved repair/modification data, the retention period will be that required by JAR-OPS 1 (3) Subpart M and not that specified in JAR 145.55(c). Until JAR-OPS 1 (3) becomes fully effective, the JAR-145 approved maintenance

JAR 145.55 (continued)

organisation must comply with the current national aviation regulations of the aircraft operator's Authority.

[Ch 2, 10.7.98;Amdt.3, 01.04.01]

JAR 145.60 [Occurrence reporting]
[(See AMC 145.60, IEM 145.60, ACJ 20X8)]

(a) The JAR-145 approved maintenance organisation must report to [its' JAA full member Authority and the organisation responsible for the design of the aircraft or aircraft component] any condition of the aircraft or aircraft component, identified by the JAR-145 approved maintenance organisation that [has resulted or may result in an unsafe condition] that could seriously hazard the aircraft.

(b) [The JAR-145 approved maintenance organisation must establish an internal occurrence reporting system acceptable to the JAA full member Authority to enable the collection and evaluation of such reports including the assessment and extraction of those occurrences to be reported under subparagraph (a) above. The procedure shall identify adverse trends, corrective actions taken to address deficiencies and include evaluation of all known relevant information relating to such occurrences and a method to circulate the information as necessary.]

[(c)] Reports must be made [in a manner acceptable to] the JAA full member Authority and contain all pertinent information about the condition [and evaluation results] known to the JAR-145 approved maintenance organisation.

[(d)] Where the JAR-145 approved maintenance organisation is contracted by [] [an] operator to carry out maintenance, the JAR-145 approved maintenance organisation must also report to the [] operator any such condition affecting the [] operator's aircraft or aircraft component. [In the case of an aircraft, where the state of registration is different to that of the JAA full member Authority that issued the appropriate JAR 145 or JAR OPS approval(s), then the National Aviation Authority of the state of registry must also be informed.]

[(e)] Reports must be made as soon as practicable but in any case within [72 hours] of the JAR-145 approved maintenance organisation identifying the condition to which the report relates.

[Ch. 2, 10.7.98; Amdt. 5, 01.01.03]

JAR 145.70(a) (continued)

JAR 145.65 Maintenance procedures and quality system

(See AMC & IEM 145.65)

(a) The JAR-145 approved maintenance organisation must establish a [safety and] quality policy for the organisation to be included in the JAR 145.70 exposition.

(b) The JAR-145 approved maintenance organisation must establish procedures acceptable to the JAA full member Authority [taking into account human factors and human performance] to ensure good maintenance practices and compliance with all relevant requirements in this JAR-145 which must include a clear work order or contract such that aircraft and aircraft components may be released to service in accordance with JAR 145.50.

(c) The JAR-145 approved maintenance organisation must establish a quality system that includes;

(1) Independent audits in order to monitor compliance with required aircraft/ aircraft component standards and adequacy of the procedures to ensure that such procedures invoke good maintenance practices and airworthy aircraft / aircraft components. In the smallest organisations the independent audit part of the quality system may be contracted to another JAR-145 approved maintenance organisation or a person with appropriate technical knowledge and proven satisfactory audit experience acceptable to the JAA full member Authority, and;

(2) A quality feedback reporting system to the person or group of persons specified in JAR 145.30(a) and ultimately to the accountable manager that ensures proper and timely corrective action is taken in response to reports resulting from the independent audits established to meet JAR-145.65(c)(1).

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

JAR 145.70 Maintenance organisation exposition

(See IEM 145.70)

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

(1) A statement signed by the accountable manager confirming that the

maintenance organisation exposition and any referenced associated manuals defines the JAR-145 approved maintenance organisation's compliance with JAR-145 and will be complied with at all times. When the accountable manager is not the chief executive officer of the JAR-145 approved maintenance organisation then such chief executive officer must countersign the statement.

(2) The organisations JAR-145.65 (a) [safety and] quality policy.

(3) The title(s) and name(s) of the senior person(s) accepted by the JAA full member Authority in accordance with JAR 145.30(a).

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

(5) An organisation chart showing associated chains of responsibility of the senior person(s) specified in sub-paragraph (3).

(6) A list of certifying staff.

(7) A general description of manpower resources.

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

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

(10) The notification procedure of JAR 145.85 for JAR-145 approved maintenance organisation changes.

(11) The maintenance organisation exposition amendment procedure.

NOTE: Sub-paragraphs (1) to (11) inclusive constitutes the management part of the maintenance organisation exposition.

(12) The JAR-145 approved maintenance organisation's procedures and quality system as required by - JAR 145.25 [to JAR 145.95 inclusive.]

(13) A list of JAR-OPS operators, if appropriate, to which the JAR-145 approved maintenance organisation provides an aircraft maintenance service.

JAR 145.70(a) (continued)

(14) A list of organisations, if appropriate, as specified in JAR 145.75(b).

(15) A list of line stations, if appropriate, as specified in JAR 145.75(d).

(16) A list of contracted JAR-145 approved maintenance organisations, if appropriate.

(b) The information specified in sub - paragraphs (6) and (12) to (16) inclusive, whilst a part of the maintenance organisation exposition, may be kept as separate documents or on separate electronic data files subject to the management part of said exposition containing a clear cross reference to such documents or electronic data files.

(c) The maintenance organisation exposition and any subsequent amendments must be approved by the JAA full member Authority.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

JAR 145.75 Privileges of the approved maintenance organisation

The JAR-145 approved maintenance organisation may only carry out the following tasks as permitted by and in accordance with the JAR-145 approved maintenance organisation exposition:

(a) Maintain any aircraft or aircraft component for which it is approved at the locations identified in the approval certificate and/or in the JAR-145 approved maintenance organisation exposition.

(b) Arrange for maintenance of any aircraft or aircraft component within the limitations of JAR 145.1(e) for which it is approved at another organisation that is working under the quality system of the JAR-145 approved maintenance organisation.

(c) Maintain any aircraft or any aircraft component for which it is approved 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 subject to the conditions specified in a procedure acceptable to the JAA full member Authority and included in the JAR-145 approved maintenance organisation exposition.

(d) Maintain any aircraft or aircraft component for which it is approved at a location identified as a line maintenance location capable of supporting minor maintenance and only if the

JAR 145.75(d) (continued)

JAR-145 approved maintenance organisation exposition both permits such activity and lists such locations.

(e) Issue certificates of release to service in respect of paragraphs (a) to (d) on completion of maintenance in accordance with JAR 145.50.

[Ch. 1, 4.8.95; Ch. 2, 10.7.98]

JAR 145.80 Limitations on the approved maintenance organisation

(See IEM 145.80)

The JAR-145 approved maintenance organisation may only maintain an aircraft or aircraft component for which it is approved when all necessary facilities, equipment, tooling, material, maintenance data and certifying staff are available.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

JAR 145.85 Changes to the approved maintenance organisation

(See IEM 145.85)

(a) The JAR-145 approved maintenance organisation must notify the JAA full member Authority of any proposal to carry out any of the following changes before such changes take place to enable the JAA full member Authority to determine continued compliance with this JAR-145 and to amend, if necessary, the approval certificate, except that in the case of proposed changes in personnel not known to the management beforehand, these changes must be notified at the earliest opportunity.

(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 JAR 145.30 (a).

(6) The facilities, equipment, tools, material, procedures, work scope and certifying staff that could affect the approval.

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

[Ch. 2, 10.7.98]

JAR 145.90 Continued validity of approval

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 -

(a) The JAR-145 approved maintenance organisation remaining in compliance with JAR-145 and;

(b) The JAA full member Authority being granted access to the JAR-145 approved maintenance organisation to determine continued compliance with this JAR-145 and;

(c) The payment of any charges prescribed by the JAA full member Authority. Failure to pay entitles the JAA full member Authority to suspend, but does not automatically render the approval invalid.

[Ch. 2, 10.7.98]

JAR 145.95 Equivalent safety case

(See IEM 145.95)

(a) The JAA full member Authority may exempt an organisation from a requirement in JAR-145 when satisfied that a situation exists not envisaged by a JAR-145 requirement and subject to compliance with any supplementary condition(s) said Authority considers necessary to ensure equivalent safety. Such supplementary condition(s) must be agreed by the JAA full member Authorities to ensure continued recognition of the approval.

(b) The JAA full member Authority may exempt an organisation from a requirement in JAR-145 on an individual case by case permission basis only subject to compliance with any supplementary condition(s) said Authority considers necessary to ensure equivalent safety.

[Ch. 2, 10.7.98]

JAR 145.100 Revocation, suspension, limitation or refusal to renew the JAR 145 approval certificate

(See IEM 145.100)

The JAA full member Authority may, on reasonable grounds after due enquiry, revoke, suspend, limit or refuse to renew the JAR-145 approval certificate if said Authority is not satisfied that the holder of the approval certificate continues to meet the requirements of

JAR 145.100 (continued)

JAR-145 subject to the conditions of subparagraph (a) or (b) as appropriate.

(a) Except as specified in subparagraph (b), before revoking, suspending, limiting or refusing to renew a JAR-145 approval certificate, the JAA full member Authority must first give at least 28 days notice to the holder in writing of its intention so to do and the reasons for its proposal and must offer the holder an opportunity to make representations and said Authority will consider those representations.

(b) In the case where the JAA full member Authority has determined that the safe operation of an aircraft could be adversely affected said Authority may in addition to subparagraph (a) provisionally suspend, in part or in whole, the JAR-145 approval certificate without prior notice until the sub-paragraph (a) procedure is complete.

[Ch. 2, 10.7.98]

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Section 2 - Acceptable Means of Compliance and Interpretative / Explanatory Material (AMC & IEM)

1 GENERAL

1.1 This Section contains Acceptable Means of Compliance and Interpretative/Explanatory Material that has been agreed for inclusion in JAR-145.

1.2 Where a particular JAR paragraph does not have an Acceptable Means of Compliance or any Interpretative/Explanatory Material, it is considered that no supplementary material is required.

2 PRESENTATION

2.1 The Acceptable Means of Compliance and Interpretative/Explanatory Material are presented in full page width on loose pages, each page being identified by the date of issue or the Change number under which it is amended or reissued.

2.2 A numbering system has been used in which the Acceptable Means of Compliance or Interpretative/Explanatory Material uses the same number as the JAR paragraph to which it refers. The number is introduced by the letters AMC or IEM to distinguish the material from the JAR itself.

2.3 The acronyms AMC and IEM also indicate the nature of the material and for this purpose the two types of material are defined as follows:

Acceptable Means of Compliance (AMC) illustrate a means, or several alternative means, but not necessarily the only possible means by which a requirement can be met. It should however be noted that where a new AMC is developed, any such AMC (which may be additional to an existing AMC) will be amended into the document following consultation under the NPA procedure.

Interpretative/Explanatory Material helps to illustrate the meaning of a requirement.

2.4 New AMC or IEM material may, in the first place, be made available rapidly by being published as a Temporary Guidance Leaflet (TGL). Maintenance TGLs can be found in the Joint Aviation Authorities Administrative & Guidance Material, Section Two, Maintenance Part Three: Temporary Guidance. The procedure associated with Temporary Guidance Leaflets are included in the Section Two - Maintenance, Part Two, Chapter 11.

NOTE: Any person who considers that there may be alternative AMCs or IEMs to those published should submit details to the Maintenance Director, with a copy to the Regulation Director, for alternatives to be properly considered by the JAA. Possible alternative AMCs or IEMs may not be used until published by the JAA as AMCs, IEMs or TGLs.

2.5 Explanatory Notes not forming part of the AMC or IEM text appear in a smaller typeface.

2.6 New, amended or corrected text is enclosed within heavy brackets.

3 BACKGROUND

3.1 JAA aircraft maintenance policy is to require any aircraft used for Commercial Air Transport purposes to be maintained by a JAR-145 organisation approved for the type of aircraft.

3.2 A JAR-145 organisation within the following limitations may also carry out maintenance on an aircraft type used for any other purpose.

3.2.1 Approval for aircraft maintenance may be either an approval for the aircraft type covering base maintenance or line maintenance or both.

3.2.2 For the purpose of the AMCs/IEMs, line maintenance, sometimes referred to as light maintenance, generally consists of pre-flight, daily, weekly, A Check and B Check.

3.2.3 Base maintenance, sometimes referred to as heavy maintenance generally consists of the C Check and D Check.

3.2.4 Where a particular aircraft type maintenance programme does not follow the above philosophy, the JAA will decide which checks need to be classified as base maintenance.

3.2.5 JAA aircraft component maintenance policy is to require aircraft components, when removed from the aircraft, to be maintained by a JAR-145 maintenance organisation approved for the type of aircraft component.

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AMC 145.1**General****See JAR 145.1**

1. Working under the quality system of an appropriately approved JAR-145 organisation refers to the case of one organisation, not itself appropriately approved to JAR-145 that carries out aircraft limited line maintenance or minor engine maintenance or maintenance of other aircraft components or a specialised service as a subcontractor for an appropriately approved JAR-145 maintenance organisation and referred to in Appendix 6 under the more common name as subcontracting. To be appropriately approved to subcontract the JAR-145 organisation should have a procedure for the control of such subcontractors as stated in AMC-145.65 (b) and described in Appendix 6. Any JAR-145 approved maintenance organisation that carries out maintenance for another JAR 145 approved maintenance organisation where the maintenance comes within the approval scope of the JAR-145 approved maintenance organisation that carries out the maintenance is not considered to be subcontracting for the purpose of this paragraph.

NOTE: For those JAR-145 approved maintenance organisations that are also certificated by the FAA under FAR Part 145 it should be noted that FAR Part 145 is more restrictive in respect of maintenance activities that can be contracted or sub-contracted to another maintenance organisation. It is therefore recommended that any listing of contracted or sub-contracted maintenance organisations should identify which meet the JAR-145 criteria and which meet the FAR Part 145 criteria.

2. Maintenance of engines or engine modules other than a complete workshop maintenance check or overhaul is intended to mean any maintenance that can be carried out without disassembly of the core engine or, in the case of modular engines, without disassembly of any core module.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

IEM 145.1**General****See JAR 145.1**

1 A JAR-145 approved maintenance organisation may also carry out maintenance on any aircraft and / or aircraft component used for any purpose other than commercial air transport within the limitations of the particular approval.

2 A JAR-145 approved maintenance organisation may be approved to maintain aircraft/aircraft components not type certificated by the JAA full member Authority that granted the JAR-145 approval.

NOTE 1: A description of what constitutes line maintenance can be found in JAA Administrative & Guidance Material, Section Two - Maintenance, Part Three - Temporary Guidance, Leaflet No 6.

NOTE 2: A JAA full member Authority type certificate is necessary for JAA full member Authority approved operators to fly the particular aircraft type. The above provision enables the JAR-145 approved maintenance organisation to maintain 'foreign' aircraft under JAR-145 approval.

[Amdt. 3, 01.04.01]

IEM 145.3**Effectivity****See JAR 145.3**

Where an organisation maintains aircraft or components in more than one of the JAR 145.3(a) subparagraphs, the organisation may use the different compliance dates stated for the particular group activity.

IEM 145.5**Definitions****See JAR 145.5**

1. With regard to the accountable manager definition, it is normally intended to mean the chief executive officer of the JAR-145 approved maintenance organisation, who by virtue of position has overall (including in particular financial) responsibility for running the organisation. The accountable manager may

IEM 145.5 (continued)

be the accountable manager for more than one organisation and is not required to be necessarily knowledgeable on technical matters as the maintenance organisation exposition defines the maintenance standards. When the accountable manager is not the chief executive officer the JAA full member Authority will need to be assured that such an accountable manager has direct access to chief executive officer and has a sufficiency of 'maintenance funding' allocation.

2. 'Restoration' should be understood to mean the work necessary to return the aircraft component to an approved standard.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

IEM 145.10(b)

Applicability

See JAR 145.10(b)

1. A JAA full member Authority need only recognise an approval granted by another JAA full member Authority in accordance with the Cyprus Arrangement of 1990 and for European Union members also Regulation 3922/91 although it should be noted that a JAA member Authority can also lose its full member status. It is therefore important to differentiate between approvals granted by a JAA full member Authority which are recognised and approvals granted by a JAA candidate member Authority which are not recognised. Also it should be noted that a JAA full member Authority may grant an approval to an organisation located in a JAA candidate member Authority State in accordance with JAR-145.10(c) which will generally be recognised by the other JAA full member Authorities. The JAA full member States are listed in Appendix No 7.

2. The JAA HQ publishes a list of all JAR-145 maintenance organisations recognised by the JAA full member Authorities on a regular basis entitled 'JAR-145 Listed Organisations'.

3. For an organisation to be approved in accordance with JAR-145.10(b) as an organisation located within the JAA full member States means that the JAR-145.30(a) management should be located in the JAA full member States. When the JAR 145.30(a) management is located in several JAA full member States, then the approval will normally be granted by the JAA full member Authority in whose State the accountable manager is located.

4. Where the organisation uses facilities both inside and outside the JAA full member State such as satellite facilities, sub-contractors, line stations etc., such facilities may be included in the approval without being identified on the approval certificate subject to the maintenance organisation exposition identifying the facilities and containing procedures to control such facilities and the JAA full member Authority being satisfied that they form an integral part of the JAR-145 approved maintenance organisation.

[Ch. 2, 10.7.98; Amdt.3, 01.04.01]

AMC 145.10(c)

Applicability

See JAR 145.10(c)

For the JAA full member Authority to be satisfied that there is a need for approval, may require the potential applicant to provide to JAA Headquarters evidence from an organisation based in a JAA full member State that such organisation would like to use the potential applicant's facilities to support an aircraft/aircraft component operated or manufactured in a JAA full member State. The evidence, when required, should be in the form of a letter(s) from the JAA full member State based organisation(s) giving reasons for the need. Evidence of need is not required in the case of a JAA full member State based organisation for its own facilities located in either a non-JAA State or a non-JAA full member State.

[Ch. 2, 10.7.98]

IEM 145.10(c)**Applicability****See JAR 145.10(c)**

1 The Joint Aviation Authorities (JAA) principal reason for accepting an organisation on the basis of an approval granted by an Authority that is not a member or full member of the JAA is to ensure the most cost effective use of its staff resources. It therefore follows that the JAA will promote this method in any State that contains a significant number of maintenance organisations used by the aviation industry of the JAA full member States.

2 JAA policy in respect of the acceptance of an organisation on the basis of an approval granted by an Authority that is not a member or full member of the JAA is to ensure equivalence to JAR-145 at the time of initial acceptance and thereafter. JAA establishes equivalence to JAR-145 by;

a. Comparing the relevant maintenance regulations and procedures with JAR-145 and JAA Administrative and Guidance Material, Section Two - Maintenance, Part Two - Procedures to determine differences and establish maintenance special conditions relative to the differences, and;

b. Being satisfied that the Authority that is not a member or full member of the JAA will co-operate and continue to co-operate with the JAA by accomplishing and reporting on routine audits and specific investigations of the organisations and maintenance, and;

c. Being satisfied that the accepted organisations comply with the maintenance special conditions established via sub-paragraph 'a' and that the Authority that is not a member or full member of the JAA reports any non-compliance that could result in suspension or revocation of the acceptance, and;

d. Being satisfied that the Authority that is not a member or full member of the JAA both receive and co-operate with JAA full member Authority staff and JAA standardisation teams, and;

e. Publishing the maintenance special conditions to be met by organisations in the specified State as acceptable means of compliance, initially as leaflets in JAA Administrative and Guidance Material, Section Two - Maintenance, Part Three - Temporary Guidance, and subsequently as an Appendix to JAR-145 Section 2.

3 In the case of accepted organisations, showing a need as per the AMC-145.10(c) procedure is only required in the case where the other Authority, not being a member or full member of the JAA finds it necessary impose a need requirement on JAR-145 approved maintenance organisations.

4 The JAA HQ publishes a list of all approved / accepted foreign JAR-145 maintenance organisations normally recognised by the JAA full member Authorities on a regular basis as part of the list referenced in IEM 145.10(b) 2.

[Ch. 2, 10.7.98]

AMC 145.15(a)**Application and Issue****See JAR 145.15(a)**

'On a form' and 'in a manner' means that JAA Form Two should be obtained from the JAA full member Authority and completed by the accountable manager. The required number of copies of the maintenance organisation exposition means the number required by the JAA full member Authority which normally means one or two. JAA HQ does not require a copy of this document.

[Ch. 2, 10.7.98; Amdt.3, 01.04.01]

IEM 145.20**Extent of Approval****See JAR 145.20**

Appendix 1 contains a table listing all classes and ratings possible under JAR-145.

[Ch. 2, 10.7.98]

AMC 145.25(a)
Facility Requirements
See JAR 145.25(a)

1 For base maintenance of aircraft, this means that aircraft hangars should be both available and large enough to accommodate aircraft on planned base maintenance. Where the hangar is not owned by the JAR-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. For aircraft component maintenance, this means that aircraft component workshops should be large enough to accommodate the components on planned maintenance.

2 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.

3 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.

AMC 145.25(b)
Facility Requirements
See JAR 145.25(b)

1 Office accommodation in this case means office accommodation 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.

AMC 145.25(c)
Facility Requirements
See JAR 145.25(c)

1 Hangars used to house aircraft together with office accommodation should be such as to ensure 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.

AMC 145.25(c) (continued)

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

AMC 145.25(d)
Facility Requirements
See JAR 145.25(d)

1 Storage facilities for serviceable aircraft components should be clean, well-ventilated and maintained at an even dry temperature to minimise the effects of condensation. Manufacturers storage recommendations should be followed for those aircraft components identified in such published recommendations.

2 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.

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

[Ch. 2, 10.7.98]

AMC 145.30(a)
Personnel Requirements
See JAR 145.30(a)

1 The person or persons nominated should represent the maintenance management structure of the organisation and be responsible for all functions specified in JAR-145. It therefore follows that, dependent upon the size of the JAR-145 organisation, the JAR-145 functions may be subdivided under individual managers (and in fact may be further subdivided) or combined in any number of ways.

2 In essence however the JAR-145 organisation should have, dependent upon the extent of approval, a base maintenance manager, a line maintenance manager, a workshop manager and a quality manager, all of whom should report to the accountable manager except in small JAR-145 organisation where any one manager may also be the accountable manager, and subject to JAA full member Authority acceptance, he may also be the line maintenance manager or the workshop manager. Procedures should make clear who deputises for any particular manager in the case of lengthy absence of said manager(s). The length of absence to justify deputising is the period beyond which the organisation cannot function properly due to such absence.

3 The accountable manager is responsible for ensuring that all necessary resources are available to accomplish maintenance in accordance with JAR 145.65(b) to support the organisation's JAR-145 approval.

4 The base maintenance manager is responsible for ensuring that all maintenance required to be carried out in the hangar, plus any defect rectification carried out during base maintenance, is carried out to the design and quality standards specified in JAR 145.65(b). The base maintenance manager is also responsible for any corrective action resulting from the quality compliance monitoring of JAR 145.65(c).

5 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 JAR 145.65(b) and also responsible for any corrective action resulting from the quality compliance monitoring of JAR 145.65(c).

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

7 The quality manager's responsibility is specified in JAR 145.30(b).

8 Notwithstanding the example sub-paragraphs 2 - 7 titles, the organisation may adopt any title for the foregoing managerial positions but should identify to the JAA full member Authority the titles and persons chosen to carry out these functions.

9 Where a JAR-145 organisation chooses to appoint managers for all or any combination of the identified JAR-145 functions because of the size of the undertaking, it is necessary that these managers

AMC 145.30(a) (continued)

report ultimately through either the base maintenance manager or line maintenance manager or workshop manager or quality manager, as appropriate, to the accountable manager.

10 The JAA full member Authority therefore requires the managers specified above to be identified and their credentials submitted on JAA Form Four to the JAA full member Authority. To be accepted, the accountable manager should demonstrate a basic understanding of JAR-145 and the responsibilities associated with being accountable manager. To be accepted, all other such managers should have relevant knowledge and satisfactory experience related to aircraft/aircraft component maintenance as appropriate in accordance with the relevant national regulations of the JAA full member Authority granting the JAR-145.

NOTE: Certifying staff may report to any of the managers specified depending upon which type of control the JAR-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 JAR 145.65 (c)(1) remain independent of all. Appendix 4 gives some organisation examples.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

AMC 145.30[(c)]
Personnel Requirements
See JAR 145.30(b)

Monitoring the quality system includes requesting remedial action as necessary by the AMC 145.30(a) accountable manager, base maintenance manager, line maintenance manager, and workshop manager as appropriate.

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.30[(d)]
Personnel Requirements
See JAR 145.30[(d)]

1 [Has] sufficient staff means that the JAR-145 approved maintenance organisation employs or contracts such staff of which at least half the staff that perform maintenance in each workshop, hanger or flight line should be employed to ensure organisational stability. Contract staff, being part time or full time should be made aware that when working for the JAR-145 approved maintenance organisation they are subjected to compliance with the organisation's procedures specified in the maintenance organisation exposition relevant to their duties. For the purpose of this sub-paragraph, employed means the person is directly employed as an individual by the JAR-145 approved maintenance [organisation] whereas contracted means the person is employed by another organisation and contracted by that organisation to the JAR-145 approved maintenance organisation.

2 The maintenance man-hour plan should take into account any maintenance carried out on aircraft / aircraft components from outside the JAA full member State.

3 The maintenance man-hour plan should relate to the anticipated maintenance work load except that when the JAR-145 approved maintenance organisation cannot predict such workload, due to the short term nature of its contracts, when such plan should be based upon the minimum maintenance workload needed for commercial viability. Maintenance work load includes all necessary work such as, but not limited to, planning, maintenance record checks, production of worksheets/cards in paper or electronic form, accomplishment of maintenance, inspection and the completion of maintenance records.

4 In the case of aircraft base maintenance, the maintenance man-hour plan should relate to the AMC 145.25(a) aircraft hangar visit plan.

5 In the case of aircraft component maintenance, the maintenance man-hour plan should relate to the AMC 145.25(a) aircraft component planned maintenance.

6 The quality monitoring compliance function man-hours should be sufficient to meet the requirement of JAR 145.65(c) which means taking into account relevant AMC 145.65(c) sub-paragraphs. Where quality monitoring staff perform other functions, the time allocated to such functions needs to be taken into account in determining quality monitoring staff numbers.

7 The maintenance man-hour plan should be reviewed at least every 3 months and updated when necessary.

AMC 145.30(c) (continued)

8 Significant deviation from the maintenance man-hour plan should be reported through the departmental manager to the quality manager and the accountable manager for review. Significant deviation means more than a 25% shortfall in available man-hours during a calendar month for any one of the functions specified in JAR 145.30[(d)].

9 The referenced maintenance man-hour plan and any associated procedure should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as item 2.22.

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.30[(e)]

Personnel Requirements

See JAR 145.30[(e)]

1 The referenced procedure requires amongst others that planners, mechanics, specialised services staff, supervisors and certifying staff are assessed for competence by 'on the job' evaluation and/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 -

a. Planners are able to interpret maintenance requirements into maintenance tasks, and have an appreciation that they have no authority to deviate from the maintenance data.

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

c. Specialised services staff are able to carry out specialised maintenance tasks to the standard specified in the maintenance data and will both inform and await instructions from their supervisor in any case where it is not possible to complete the specialised maintenance in accordance with the maintenance data.

d. Supervisors are able to ensure that all required maintenance tasks are carried out and where not completed or where it is evident that a particular maintenance task cannot be carried out to the maintenance data, then such problems will be reported to the JAR-145.30(b) person for appropriate action. In addition, for those supervisors who also carry out maintenance tasks, that they understand such tasks should not be undertaken when incompatible with their management responsibilities.

e. 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.

3. Particularly, in the case of planners, specialised services staff, supervisors and certifying staff, a knowledge of organisation procedures relevant to their particular role in the organisation is important.

4. Quality audit staff are able to monitor compliance with JAR-145 identifying non compliance in an effective and timely manner in order that the JAR-145 approved maintenance organisation may remain in compliance JAR-145.

[5. In respect to the understanding of the application of human factors and human performance issues, maintenance, management, and quality audit personnel should be assessed for the need to receive Initial Human Factors training, but in any case all maintenance, management, and quality audit personnel should receive Human Factors continuation training. This should concern to a minimum:

- Post-holders, managers, supervisors
- Certifying staff, technicians, and mechanics.
- Technical support personnel such as, planners, engineers, technical record staff
- Quality control/assurance staff
- Specialised services staff
- Human factors staff/ Human factors trainers
- Store department staff, Purchasing dept. staff
- Ground equipment operators
- Contract staff in the above categories]

AMC 145.30(e) (continued)

[6. Initial Human Factors training should normally cover all the topics of the Training Syllabus in Appendix 9 either as a dedicated course or else integrated within other training. The syllabus may be adjusted to reflect the particular nature of the organisation. The syllabus may also be adjusted to meet the particular nature of work for each function within the organisation. For example:

- small organisations not working in shifts may cover in less depth subjects related to teamwork and communication,
- planners may cover in more depth the scheduling and planning objective of the syllabus and in less depth the objective of developing skills for shift working.

Depending on the result of paragraph 5 evaluation, initial training should be provided to personnel within 6 months of joining the maintenance organisation, but temporary staff may need be trained shortly after joining the organisation to cope with the duration of employment.

Personnel being recruited from another JAR 145 approved maintenance organisation and temporary staff should be assessed for the need to receive any additional Human Factors training to meet the new JAR 145 approved maintenance organisation's Human Factors training standard.

7 The purpose of Human Factors continuation training is primarily to ensure that staff remain current in terms of human factors and also to collect feedback on Human Factors issues.. Consideration should be given to the possibility that such training has the involvement of the quality department. There should be a procedure to ensure that feedback is formally passed from the trainers to the quality department to initiate action where necessary.

Human Factors continuation training should be of sufficient duration in each two year period in relation to relevant quality audit findings and other internal/external sources of information available to the organisation on human errors in maintenance.

8 Human factors training may be conducted by the maintenance organisation itself, or independent trainers or any training organisations acceptable to the Authority.

9 The Human Factors training procedure should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as item 3.9.]

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.30[(f)]

Personnel Requirements

See JAR 145.30[(f)]

1 Continued airworthiness non-destructive testing means such testing specified by the type certificate holder /aircraft or engine or propeller manufacturer in JAR 145.45 maintenance data for in service aircraft/aircraft components for the purpose of determining the continued fitness of the product to operate safely.

2 Appropriately qualified means to Level 1, 2 or 3 as defined by the JAA agreed issue of EN 4179 dependant upon the non-destructive testing function to be carried out. The current JAA agreed issue of [the standard is EN 4179:2000.]

3 Notwithstanding the fact that Level 3 personnel may be qualified via EN 4179 to establish and authorise methods, techniques, etc., does not permit such personnel to deviate from methods and techniques published by the type certificate holder/manufacturer in the form of continued airworthiness data, such as in non-destructive test manuals or service bulletins, unless the manual or service bulletin expressly permits such deviation.

4 Notwithstanding the general references in EN 4179 to a National aerospace NDT Board, all examinations should be conducted by personnel or organisations under the general control of such a Board. In the absence of a National aerospace NDT Board, the JAA full member Authority will make arrangements with another JAA full member Authority to use the NDT Board of that State.

5 Particular non-destructive test means any one or more of the following; Dye penetrant, magnetic particle, eddy current, ultrasonic and radiographic methods including X ray and gamma ray.

6 In addition it should be noted that new methods are and will be developed, such as, but not limited to thermography and shearography, which are not specifically addressed by EN 4179. Until such time as an

AMC 145.30(f) (continued)

agreed standard is established such methods should be carried out in accordance with the particular equipment manufacturers recommendations including any training and examination process to ensure competence of the personnel with the process.

7 Any JAR-145 approved maintenance organisation that carries out continued airworthiness non-destructive testing should establish non-destructive testing specialist qualification procedures acceptable to the JAA full member Authority.

8 Boroscopying and other techniques such as delamination coin tapping are non-destructive inspections rather than non-destructive testing. Notwithstanding such differentiation, the JAR-145 approved maintenance organisation should establish a procedure acceptable to the JAA full member Authority to ensure that personnel who carry out and interpret such inspections are properly trained and assessed for their competence with the process. Non-destructive inspections, not being considered as non-destructive testing by JAR-145 are not listed in Appendix 1 under class rating D1.

9 The referenced standards, methods, training and procedures should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as item 3.11.

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.30[(g)](1)

Personnel Requirements

See JAR 145.30[(g)](1)

1 Certifying staff qualified in accordance with JAR-66 category B1 and/or B2 includes those personnel holding protected rights under JAR-66.1(d).

2 For the purposes of category A minor scheduled line maintenance means any minor scheduled inspection/check up to and including a weekly check specified in the operators approved aircraft maintenance programme. For aircraft maintenance programmes that do not specify a weekly check, the JAA full member Authority will determine the most significant check that is considered equivalent to a weekly check.

3 Typical tasks permitted after appropriate task training to be carried out by the category A for the purpose of the category A issuing a JAR-145.50 aircraft certificate of release to service as part of minor scheduled line maintenance or simple defect rectification are contained in the following list.

- a Replacement of wheel assemblies.
- b Replacement of wheel brake units.
- c Replacement of emergency equipment .
- d Replacement of ovens, boilers and beverage makers.
- e Replacement of internal and external lights, filaments and flash tubes.
- f Replacement of windscreen wiper blades.
- g Replacement of passenger and cabin crew seats, seat belts and harnesses.
- h Closing of cowlings and refitment of quick access inspection panels.
- i Replacement of toilet system components but excluding gate valves.
- j Simple repairs and replacement of internal compartment doors and placards but excluding doors forming part of a pressure structure.
- k Simple repairs and replacement of overhead storage compartment doors and cabin furnishing items.
- l Replacement of static wicks.
- m Replacement of aircraft main and APU aircraft batteries.
- n Replacement of inflight entertainment system components but excluding public address.
- o Routine lubrication and replenishment of all system fluids and gases.

AMC 145.30(g)(1) (continued)

- p The de-activation only of sub-systems and aircraft components as permitted by the operator's minimum equipment list where such de-activation is agreed by the JAA full member Authority as a simple task.
- q Replacement of any other aircraft component as agreed by the JAA full member Authority in conjunction with the JAA Maintenance Division for a particular aircraft type only where it is agreed that the task is simple.

NOTE: This list will be periodically updated in the light of ongoing experience and technological changes.

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.30[(g)](2)

Personnel Requirements

See JAR-145.30[(g)](2)

1 JAR-145.30[(g)](2) requires in the case of aircraft base maintenance, category C certifying staff supported by category B1 and B2 qualified staff. Support means that the category B1 qualified staff must be satisfied that all mechanical tasks / inspections have been carried out to the required standard and the category B2 qualified staff must be satisfied that all avionic tasks / inspections have been carried out to the required standard before the category C certifying staff issues the certificate of release to service. The primary role of the category C certifying staff is to ensure that all work required to be carried out during the particular base maintenance check has been called up and accomplished. The secondary but equally important role of the category C certifying staff is to assess the impact of any work not carried out with a view to either requiring its accomplishment or agreeing with the operator to defer such work to another specified check or time limit.

2 Qualified category B1 and B2 means, except where stated otherwise in sub-paragraph 3, holding an appropriately type rated JAR-66 aircraft maintenance licence in either category B1, category B2 or both category B1 and B2. Such personnel should, as required by JAR-145.30[(g)](2) be in compliance with JAR-145.35(b) and (e). These personnel need not be certifying staff but the JAR-145 approved maintenance organisation may use appropriately qualified certifying staff to satisfy the requirement.

3 For those JAR-145 approved maintenance organisations that prior to JAR-66 worked in accordance with National requirements not containing licensing requirements, the organisation should identify in conjunction with the JAA full member Authority those staff considered to have equivalent qualifications to either JAR-66 category B1 or B2. Such staff will be considered as supporting the JAR-66 category C certifying staff and may qualify for the limited JAR-66 aircraft maintenance licence.

4 Certifying staff qualified in accordance with JAR-66 category C includes those personnel holding protected rights under JAR-66.1(d).

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.35(a)

Certifying Staff

See JAR 145.35(a)

Adequate understanding of the relevant aircraft and/or aircraft component(s) to be maintained together with the associated organisation procedures means that the person has received training and passed an examination or has relevant maintenance experience and passed an examination on the product type and associated organisation procedures such that the person understands how the product functions, what are the more common defects with associated consequences. Note that JAR-66 mandates product type training and examination for aircraft of 5 700 kg and above. Such training meets the intent of this AMC for such aircraft.

Alternatively such training and examination may be reduced or eliminated when AMC 145.35(e) sub-paragraph 3 is taken into account.

[Amdt. 3, 01.04.01]

AMC 145.35(c)
Certifying Staff
See JAR 145.35(c)

1 Continuation training is a two way process to ensure that certifying staff remain current in terms of procedures, human factors and technical knowledge and that the JAR-145 approved maintenance organisation receives feedback on the adequacy of its procedures and maintenance instructions. Due to the interactive nature of this training, consideration should be given to the possibility that such training has the involvement of the quality department to ensure that feedback is actioned. Alternatively, there should be a procedure to ensure that feedback is formally passed from the training department to the quality department to initiate action.

2 Continuation training should cover changes in relevant requirements such as JAR-145, changes in organisation procedures and the modification standard of the products being maintained plus human factor issues identified from any internal or external analysis of incidents. It should also address instances where staff failed to follow procedures and the reasons why particular procedures are not always followed. In many cases the continuation training will reinforce the need to follow procedures and ensure that incomplete or incorrect procedures are identified to the company in order that they can be corrected. This does not preclude the possible need to carry out a quality audit of such procedures.

3 Continuation training should be of sufficient duration in each 2 year period to meet the intent of JAR-145.35(c) and may be split into a number of separate elements. JAR-145.35(c) relates such training to keeping certifying staff updated in terms of relevant technology, procedures and human factors issues which means it is one part of ensuring quality. Therefore sufficient duration should be related to relevant quality audit findings and other internal / external sources of information available to the organisation on human errors in maintenance. This means that in the case of a JAR-145 approved maintenance organisation that maintains aircraft with few relevant quality audit findings, continuation training could be limited to days rather than weeks, whereas a similar organisation with a number of relevant quality audit findings, such training may take several weeks. For a JAR-145 approved maintenance organisation that maintains aircraft components, the duration of continuation training would follow the same philosophy but should be scaled down to reflect the more limited nature of the activity. For example certifying staff who release hydraulic pumps may only require a few hours of continuation training whereas those who release turbine engine may only require a few days of such training. The content of continuation training should be related to relevant quality audit findings and it is recommended that such training is reviewed at least once in every 24 month period.

4 The method of training is intended to be a flexible process and could, for example, include a JAR-147 continuation training course, aeronautical college courses, internal short duration courses, seminars, etc. The elements, general content and length of such training should be specified in the JAR-145 maintenance organisation exposition unless such training is undertaken under a JAR-147 approval when such details may be specified under the JAR-147 approval and cross referenced in the JAR-145 maintenance organisation exposition.

[Amdt. 3, 01.04.01]

AMC 145.35(d)
Certifying Staff
See JAR 145.35(d)

1 The programme for continuation training should list all certifying staff and when training will take place, the elements of such training and an indication that it was carried out reasonably on time as planned. Such information should subsequently be transferred to the certifying staff record as required by JAR-145.35(h).

2 The referenced procedure should be specified in the Maintenance Organisation Exposition as part of item 3.4 in Appendix 2 to this Section.

[Amdt. 3, 01.04.01]

AMC 145.35(e)
Certifying Staff
See JAR-145.35(e)

1 As stated in JAR-145.35(e), with one exception, all prospective certifying staff are required to be assessed for competence, qualification and capability related to intended certifying duties. There are a number of ways in which such assessment may be carried out but the following points need to be considered to establish an assessment procedure that fits the particular JAR-145 approved maintenance organisation.

2 Competence and capability can be assessed by working the person under the supervision of either another certifying person or a quality auditor for sufficient time to arrive at a conclusion. Sufficient time could be as little as a few weeks if the person is fully exposed to relevant work. It is not practical to assess against the complete spectrum of intended duties and this should not be done. When the person has been recruited from another JAR-145 approved maintenance organisation and was a certifying person in that organisation then it is reasonable to accept a written confirmation from the person responsible for running the quality system about the person.

3 Qualification assessment means collecting copies of all documents that attest to qualification, such as the licence and/or any authorisation held. This should be followed by a confirmation check with the organisation(s) that issued such document(s) and finally a comparison check for differences between the product type ratings on the qualification documents and the relevant product types maintained by the JAR-145 approved maintenance organisation. This latter point may reveal a need for product type differences training.

4 The referenced procedure should be specified in the Maintenance Organisation Exposition as part of item 3.4 in Appendix 2 to this Section.

[Amdt. 3, 01.04.01]

AMC 145.35(f)
Certifying Staff
See JAR-145.35(f)

The JAR-145 certification authorisation should be in a style that makes its scope clear to certifying staff and any authorised person that may require to examine the authorisation. Where codes are used to define scope, a code translation should be readily available. Authorised persons include any JAA full member Authority surveyor and any member of a JAA Maintenance Standardisation Team.

[Amdt. 3, 01.04.01]

AMC 145.35(h)
Certifying Staff
See JAR 145.35(h)

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

AMC 145.35(h) (continued)

k. Identification Number of the authorisation

2 The record may be kept in any format but should be controlled by the organisation's quality department. This does not mean that the quality department should run the record system.

3 Persons authorised to access the 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.

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

5 The JAA full member Authority is an authorised person when investigating the records system for initial and continued approval or when the JAA full member Authority has cause to doubt the competence of a particular certifying person.

6 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 staff should be furnished on request with a copy of their record on leaving the organisation.

[Amdt. 3, 01.04.01]

AMC 145.35(j)
Certifying Staff
See JAR-145.35 (j)

Certifying staff are not required to carry their JAR-145 certification authorisation. A reasonable time in which to show such certification authorisation is within 24 hours. Authorised persons means any official or business person or organisation with a valid reason for seeing the JAR-145 certification Authorisation. Valid reasons include the need to check such authorisation for validity, scope and authenticity.

AMC 145.40(a)
Equipment, Tools and Material
See JAR 145.40(a)

1 Once the applicant for JAR-145 approval has determined the intended scope of approval for consideration by the JAA full member Authority, it will be necessary to show that all tools and equipment as specified in the approved data can be made available when needed. All such tools and equipment that require to be controlled in terms of servicing or calibration by virtue of being necessary to measure specified dimensions and torque figures etc, should be clearly identified and listed in a control register including any personal tools and equipment that the organisation agrees can be used. Where the manufacturer specifies a particular tool or equipment, then that tool or equipment should be used, unless otherwise agreed by the JAA full member Authority in a particular case via a procedure specified in the maintenance organisation exposition to use alternative tooling/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 A JAR-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.

[Ch. 2, 10.7.98]

AMC 145.40(b)**Equipment, Tools and Material****See JAR 145.40(b)**

1 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.

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

[Ch. 2, 10.7.98]

AMC 145.45(b)**Maintenance Data****See JAR 145.45(b)**

1 Except as specified in sub-paragraph 5, each JAR-145 approved maintenance organisation should hold and use the following minimum maintenance data relevant to the organisation's approval class rating. All maintenance related JARs and associated AMCs and IEMs, all JAA maintenance related temporary guidance leaflets, the JAA publication entitled 'JAR-145 Listed Organisations', all applicable national maintenance requirements and notices which have not been superseded by a JAA requirement, procedure or directive and all applicable national airworthiness directives plus any non-national airworthiness directive supplied by a contracted non-national operator or customer.

2 In addition to sub-paragraph 1, a JAR-145 approved maintenance organisation with an approval class rating in category A - Aircraft, should hold and use the following maintenance data where published. The appropriate sections of the operator's aircraft maintenance programme, aircraft maintenance manual, repair manual, supplementary structural inspection document, corrosion control document, service bulletins, service letters, service instructions, modification leaflets, NDI manual, parts catalogue, type certificate data sheet and any other specific document issued by the type certificate or supplementary type certificate holder as maintenance data, except that in the case of operator or customer provided maintenance data it is not necessary to hold such provided data when the work order is completed other than the need to comply with JAR 145.55(c).

3 In addition to sub-paragraph 1, a JAR-145 approved maintenance organisation with an approval class rating in category B - Engines/APUs, should hold and use the following maintenance data where published. The appropriate sections of the engine/APU maintenance and repair manual, service bulletins, service letters, modification leaflets, NDI manual, parts catalogue, type certificate data sheet and any other specific document issued by the type certificate holder as maintenance data, except that in the case of operator or customer provided maintenance data it is not necessary to hold such provided data when the work order is completed other than the need to comply with JAR 145.55(c).

4 In addition to sub-paragraph 1, a JAR-145 approved maintenance organisation with an approval class rating in category C - Components other than complete engines/APUs, should hold and use the following maintenance data where published. The appropriate sections of the vendor maintenance and repair manual, service bulletins and service letters plus any document issued by the type certificate holder as maintenance data on whose product the component may be fitted when applicable, except that in the case of operator or customer provided maintenance data it is not necessary to hold such provided data when the work order is completed other than the need to comply with JAR 145.55(c)

5 Appropriate sections of the sub-paragraphs 2 to 4 additional maintenance data means in relation to the maintenance work scope at each particular maintenance facility. In other words for example, a base maintenance facility should have almost complete set(s) of the maintenance data whereas a line maintenance facility may need only the maintenance manual and the parts catalogue.

6 A JAR-145 approved maintenance organisation only approved in class rating category D - Specialised services, should hold and use the following maintenance data where published in respect of the particular specialised service(s) specified in the approval schedule. JAR-145 plus associated AMCs and

AMC 145.45(b) (continued)

IEMs and the specialised service(s) process specification, except that in the case of operator or customer provided maintenance data it is not necessary to hold such provided data when the work order is completed other than the need to comply with JAR 145.55(c).

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

**[AMC 145.45(c)
Maintenance Data
See JAR 145.45(c)]**

1 The referenced procedure should ensure that when maintenance personnel discover inaccurate, incomplete or ambiguous information in the maintenance data they should record the details. The procedure should then ensure that the JAR-145 approved maintenance organisation notifies the problem to the author of the maintenance data in a timely manner. A record of such communications to the author of the maintenance data should be retained by the JAR-145 approved organisation until such time as the type certificate holder has clarified the issue by e.g. amending the maintenance data.

2 The referenced procedure should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as item 2.26.]

[Amdt. 5, 01.01.03]

**AMC 145.45[(d)]
Maintenance Data
See JAR 145.45[(d)]**

The referenced procedure should address the need for a practical demonstration by the mechanic to the quality personnel of the proposed modified maintenance instruction. The quality personnel should approve (or not approve) the modified maintenance instruction and ensure that the type certificate or supplementary type certificate holder is informed of the modified maintenance instruction. The procedure should include a paper/electronic traceability of the complete process from start to finish and ensure that the relevant maintenance instruction clearly identifies the modification. Modified maintenance instructions should only be used in the following circumstances;

a Where the type certificate / supplementary type certificate holders original intent can be carried out in a more practical or more efficient manner.

b Where the type certificate / supplementary type certificate holders original intent cannot be achieved by following the maintenance instructions. For example, where a component cannot be replaced following the original maintenance instructions.

c For the use of alternative tools / equipment.

[Ch. 2, 10.7.98; Amdt. 5, 01.01.03]

**AMC 145.45[(e)]
Maintenance Data
See JAR 145.45[(e)]**

1 A JAR-145 approved maintenance organisation also approved in accordance with JAR-21 Subpart JA is required by JAR-145.45[(e)] to establish a repair classification procedure. To satisfy the requirement, the organisation should describe how repairs will be classified in accordance with JAR-21 Subpart M, how a new repair design will be approved and how the organisation will ensure that only approved repair data is used in the implementation of a repair. The procedure should also include appropriate elements from subparagraph 2.

2 A JAR-145 approved maintenance organisation not approved in accordance with JAR-21 Subpart JA is required by JAR-145.45[(e)] to establish a procedure to process minor or major repairs. To satisfy the requirement, the organisation should describe the actions to be taken when the need for damage assessment and / or repair action arises. At minimum, the procedure should address the need to assess damage against published approved repair data and the action to be taken if damage is beyond the limits or outside the scope of such data. This could involve any one or more of the following options; Repair by

AMC 145.45(e) (continued)

replacement of damaged parts, requesting technical support from the type certificate holder or from an organisation approved in accordance with JAR-21 Subpart JA and finally JAA full member approval of the particular repair data.

3 The reference in sub-paragraph 2 to published approved repair data means the data specified in JAR 145.45(b).

4 For the purpose of JAR 145.45[(e)] reference to minor or major repair relates only to design criteria and not to maintenance criteria.

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.45[(f)]
Maintenance Data
See JAR 145.45[(f)]

1 Relevant parts of the organisation means with regard to aircraft base maintenance, aircraft line maintenance, engine workshops, mechanical workshops and avionics workshops. Therefore, for example engine workshops should have a common system throughout such engine workshops that may be different to that in aircraft base maintenance.

2 Complex maintenance tasks should be transcribed onto the workcards or worksheets and subdivided into clear stages to ensure a record of the accomplishment of the maintenance task. Of particular importance is the need to differentiate and specify, when relevant, disassembly, accomplishment of task, reassembly and testing. In the case of a lengthy maintenance task involving a succession of personnel to complete such task, it may be necessary to use supplementary workcards or worksheets to indicate what was actually accomplished by each individual person.

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.45 [(g) & (h)]
Maintenance Data
See JAR 145.45 [(g) & (h)]

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 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 readers/printers are used, a similar requirement is applicable.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

[AMC 145.47(a)]
Production Planning
See JAR 145.47(a)

1. Depending on the amount and complexity of work generally performed by the maintenance organisation, the planning system may range from a very simple procedure to a complex organisational set-up including a dedicated planning function in support of the production function.

2. For the purpose of JAR 145, the production planning function includes two complementary elements:

-scheduling the maintenance work ahead, to ensure that it will not adversely interfere with other work as regards the availability of all necessary personnel, tools, equipment, material, maintenance data and facilities.

- during maintenance work, organising maintenance teams and shifts and provide all necessary support to ensure the completion of maintenance without undue time pressure.]

AMC 145.47(a) (continued)

[3. When establishing the production planning procedure, consideration should be given to the following:

- logistics,
- inventory control,
- square meters of accommodation,
- man-hours estimation,
- man-hours availability,
- preparation of work,
- hangar availability
- environmental conditions (access, lighting standards and cleanliness)
- co-ordination with internal and external suppliers, etc.
- scheduling of safety-critical tasks during periods when staff are likely to be most alert.]

[Amdt. 5, 01.01.03]

[IEM 145.47(b)
Production Planning
See JAR 145.47(b)

Limitations of human performance, in the context of planning safety related tasks, refers to the upper and lower limits, and variations, of certain aspects of human performance (Circadian rhythm / 24 hours body cycle) which personnel should be aware of when planning work and shifts.]

[Amdt. 5, 01.01.03]

[AMC 145.47(c)
Production Planning
See JAR 145.47(c)

1. The primary objective of the changeover information is to ensure effective communication at the point of handing over the continuation or completion of maintenance actions. Effective task and shift handover depends on three basic elements:

- The outgoing person's ability to understand and communicate the important elements of the job or task being passed over to the incoming person.
- The incoming person's ability to understand and assimilate the information being provided by the outgoing person.
- A formalised process for exchanging information between outgoing and incoming persons and a planned shift overlap and a place for such exchanges to take place.

2 The referenced procedure should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as item 2.25.]

[Amdt. 5, 01.01.03]

AMC 145.50(a)
Certification of Maintenance
See JAR 145.50(a)

1 A certificate of release to service is necessary before flight at the completion of any package of maintenance specified by the aircraft operator in accordance with such operator's responsibility in JAR OPS 1(3). 890. The package of maintenance may include any one or combination of the following elements; a check or inspection from the operator's aircraft maintenance programme, Airworthiness Directives, overhauls, repairs, modifications, aircraft component replacements and defect rectification.

New defects or incomplete maintenance work orders identified during the above maintenance should be brought to the attention of the aircraft operator for the specific purpose of obtaining agreement to rectify such

AMC 145.50(a) (continued)

defects or completing the missing elements of the maintenance work order. In the case where the aircraft operator declines to have such maintenance carried out JAR 145.50(d) will apply.

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.

4 The authorised release certificate/airworthiness approval tag identified as JAA Form One (see Appendix No. 3) for the JAA full member States constitutes the aircraft component certificate of release to service when an aircraft component is maintained by one JAR-145 organisation for another JAR-145 organisation.

5 When a JAR-145 organisation maintains an aircraft component for use by the organisation, a JAA Form One may not be necessary depending upon the organisations' internal release procedures defined in the maintenance organisation exposition.

[Amdt. 3, 01.04.01; Amdt 4, 01.11.01]

AMC 145.50(b)

Certification of Maintenance

See JAR 145.50(b)

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

'Certifies that the work specified except as otherwise specified was carried out in accordance with JAR-145 and in respect to that work the aircraft/aircraft component is considered ready for release to service'.

Note: The Release to Service statement in block 19 of the JAA Form One is slightly at variance with the above statement in that it refers to information in particular boxes on the Form.

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

3 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.

4 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.

5 The person issuing the certificate of release to service should use his normal signature except in the case where a computer release to service system is used. In this latter case the JAA full member Authority will need to be satisfied that only the particular person can electronically issue the release to service. One such method of compliance is the use of a magnetic or optical personal card in conjunction with a personal identity number (PIN) known only to the individual which is keyed into the computer. A certification stamp is optional.

[Ch. 2, 10.7.98; Amdt 4, 01.11.01]

AMC 145.50(c)

Certification of Maintenance

See JAR 145.50(c)

1 A JAA Form One may be issued by the JAR-145 approved maintenance organisation for those aircraft components last maintained prior to JAR-145 where the JAR-145 approved maintenance organisation has established a procedure acceptable to the JAA full member Authority to ensure that only aircraft components meeting all other requirements will be issued a JAA Form One.

NOTE: A USA based JAA accepted JAR-145 maintenance organisation may issue an FAA Form 8130 in lieu of the JAA Form One, whereas a Canadian based JAA accepted JAR-145 maintenance organisation may issue a TCA Form 24-0078 in lieu of the JAA Form One. Both these forms are deemed equivalent to the JAA Form One when issued by such JAA accepted JAR-145 maintenance organisations.

[Amdt. 3, 01.04.01]

AMC 145.50(d)**Certification of Maintenance****See JAR 145.50(d)**

1 Being unable to establish full compliance with sub-paragraph (a) means that the maintenance required by the aircraft operator could not be completed due either to running out of available aircraft maintenance downtime for the scheduled check or by virtue of the condition of the aircraft requiring additional maintenance downtime.

2 As stated in JAR OPS 1 (3). 890 the aircraft operator is responsible for ensuring that all required maintenance has been carried out before flight and therefore JAR 145.50(e) requires such operator to be informed in the case where full compliance with JAR-145.50(a) cannot be achieved within the operators limitations. If the operator agrees to the deferment of full compliance, then the certificate of release to service may be issued subject to details of the deferment, including the operator's authority, being endorsed on the certificate.

NOTE: Whether or not the aircraft operator does have the authority to defer maintenance is an issue between the aircraft operator and its National Authority. In case of doubt concerning such a decision of the operator, the JAR-145 approved maintenance organisation should inform its JAA full member Authority, of such doubt, before issue of the certificate of release to service. This will allow the JAA full member Authority to investigate the matter with the National Authority of the operator whether it be the State of Registry or the State of the operator.

3 The procedure should draw attention to the fact that JAR-145.50 (a) does not normally permit the issue of a certificate of release to service in the case of non-compliance and should state what action the mechanic, supervisor and certifying staff should take to bring the matter to the attention of the relevant department or person responsible for technical co-ordination with the aircraft operator so that the issue may be discussed and resolved with the aircraft operator. In addition, the appropriate JAR 145.30(a) person(s) should be kept informed in writing of such possible non-compliance situations and this should be included in the procedure.

4 The referenced procedure should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as item 2.16.

[Amdt. 3, 01.04.01]

AMC 145.50(e)**Certification of Maintenance****See JAR 145.50(e)**

1 Suitable serviceable tag means a tag which clearly states that the aircraft component is serviceable; that clearly specifies the organisation releasing said component together with details of the JAA member Authority or non-JAA member Authority under whose approval the organisation works including the approval or authorisation reference.

2 Compliance with all other JAR-145 and JAR OPS 1 or 3 Subpart M requirements means making an appropriate entry in the aircraft technical log, checking for compliance with type design standards, modifications, repairs, airworthiness directives, life limitations and condition of the aircraft component plus information on where, when and why the aircraft was grounded.

[Amdt. 3, 01.04.01]

AMC 145.50(f)**Certification of Maintenance****See JAR 145.50(f)**

A non-compliance known to the JAR-145 approved maintenance organisation which could hazard flight safety means any instances where safe operation could not be assured or which could lead to an unsafe condition. It typically includes, but is not limited to, significant cracking, deformation, corrosion or failure of primary structure, any evidence of burning, electrical arcing, significant hydraulic fluid or fuel leakage and any emergency system or total system failure. An Airworthiness Directive overdue for compliance is also considered a hazard to flight safety. As stated in JAR 145.50(f) a certificate of release to service may not be issued under these circumstances.

[Amdt. 3, 01.04.01]

IEM 145.55(a)
Maintenance Records
See JAR 145.55(a)

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. As a minimum] records necessary to prove all requirements have been met for issuance of the certificate of release to service including sub-contractor's release documents should be retained. The prime objective is to have secure and easily retrievable records with comprehensive and legible contents. The aircraft record should contain basic details of all serialised aircraft components and all other significant aircraft components installed, to ensure traceability to such installed aircraft component documentation and associated JAR-145.45 maintenance data.

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 these things have 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 JAA full member 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.

IEM 145.55(b)
Maintenance Records
See JAR 145.55(b)

A self-explanatory paragraph that requires the JAR-145 organisation to give the operator the certificate of release to service including basic details of maintenance carried out, whereas JAR-145.55(c) requires the JAR-145 organisation to retain the record of all maintenance.

AMC 145.55(c)
Maintenance Records
See JAR 145.55(c)

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

2 Computer backup 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 a JAR-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 JAA full member Authority.

[Ch. 2, 10.7.98]

**[AMC 145.60
Occurrence reporting
(See JAR 145.60)**

1 The aim of occurrence reporting is to identify the factors contributing to incidents, and to make the system resistant to similar errors.

2 An occurrence reporting system should enable and encourage free and frank reporting of any (potentially) safety related occurrence. This will be facilitated by the establishment of a just culture. An organisation should ensure that personnel are not inappropriately punished for reporting or co-operating with occurrence investigations

3 The internal reporting process should be closed-loop, ensuring that actions are taken internally to address safety hazards.

4 Feedback to reportees, both on an individual and more general basis, is important to ensure their continued support for the scheme.]

[Amdt. 5, 01.01.03]

**IEM 145.60(a)
[Occurrence reporting]
See JAR 145.60(a), [ACJ 20X8]**

[1] In respect of the JAR-145 organisation, a condition that could seriously hazard the aircraft is normally limited to:

- a. Serious cracks, permanent deformation, burning or serious corrosion of structure found during scheduled maintenance of the aircraft or engine or propeller or helicopter rotor system.
- b. Failure of any emergency system during scheduled testing.

[2. The organisation responsible for the design is normally the Type Certificate Holder of the aircraft, engine or propeller and/or if known the Supplemental Type Certificate (STC) Holder, the Joint Technical Standard Order (JTSO) Authorisation Holder or the Joint Parts Approval (JPA) Authorisation Holder as appropriate.]

NOTE: (1) JAR-OPS will cover other conditions to be reported by the operator.

NOTE: (2) The JAA full member Authority may require other specific maintenance findings to be reported by Airworthiness Directive action.

[NOTE: (3) Further information is contained in ACJ 20X8]

[Amdt. 5, 01.01.03]

**[IEM 145.60(c)
Occurrence reporting
See JAR 145.60(c), ACJ 20X8]**

In a manner acceptable to the JAA full member Authority means that the report may be transmitted by any method acceptable to the Authority. Each report should contain at least the following information:

- Organisation name and approval reference.
- Information necessary to identify the subject aircraft and / or component.
- Date and time relative to any life or overhaul limitation in terms of flying hours/cycles/landings etc. as appropriate.
- Details of the condition as required by JAR 145.60(b).
- Any other relevant information found during the evaluation or rectification of the condition.]

[Amdt. 5, 01.01.03]

[AMC 145.65(a)**Maintenance Procedures and Quality System****See JAR 145.65(a)**

The safety and quality policy should as a minimum include a statement committing the organisation to:

- Recognise safety as a prime consideration at all times
- Apply Human factors principles
- Encourage personnel to report maintenance related errors/incidents
- Recognise that compliance with procedures, quality standards, safety standards and regulations is the duty of all personnel
- Recognise the need for all personnel to cooperate with the Quality Auditors.]

[Amdt. 5, 01.01.03]

AMC 145.65(b)**Maintenance procedures and quality system****See JAR 145.65 (b)**

1 The maintenance procedures should [reflect the safety and quality policy and] cover all aspects of carrying out the maintenance activity including the provision and control of specialised services] and in reality lay down the standards to which the JAR maintenance organisation intends to work. Such standards need at a minimum to be those required by JAR-145.

2 Specialised services includes any specialised activity, such as, but not limited to Non-Destructive Testing requiring particular skills and/or qualification. JAR 145.30[(f)] covers the qualification of personnel but, in addition, there is a need to establish maintenance procedures that cover the control of any specialised process.

3 Appendix 6 contains a procedure for subcontracting that meets the intent of part of JAR 145.1 (b), (c) and (e) as specified in AMC 145.1.

4 In the case of aircraft line and base maintenance, [in order to minimise the risk of multiple errors and capture errors on critical systems:

a.] Procedures should be established to ensure that no one person be required to carry out and inspect in relation to a maintenance task involving some element of disassembly / reassembly of several aircraft components of the same type fitted to more than one system on the same aircraft during a particular maintenance check. The purpose of this procedure is to minimise the rare possibility of an error being repeated whereby the identical aircraft components are not reassembled thereby compromising more than one system. One example is the remote possibility of failure to reinstall engine gearbox access covers or oil filler caps on all engines of a multi-engined aircraft resulting in major oil loss from all engines.

Alternatively, when only one person is available to carry out these same tasks then the workcard / worksheet should include an additional stage for re-inspection of the work by the person after completion of all the same tasks. This means for example, that in the case of removal and refitment of oil filler caps, a re-inspection of all oil filler caps should be carried out after the last oil filler cap has supposedly been refitted.

[b Procedures should be established to detect and rectify maintenance errors that could, as a minimum, result in a failure, malfunction, or defect endangering the safe operation of the aircraft if not performed properly. The procedure should identify the method for capturing errors, and the maintenance tasks or processes concerned.

In order to determine the work items to be considered, the following maintenance tasks should primarily be reviewed for their criticality:

- Installation, rigging and adjustments of flight controls,
- Installation of aircraft engines, propellers and rotors,
- Overhaul, calibration or rigging of components such as engines, propellers, transmissions and gearboxes,

but additional information should also be processed, such as:

- Previous experiences of maintenance errors, depending on the consequence of the failure,
- Information arising from the 'occurrence reporting system' required by JAR 145.60,
- NAA national requirements for error capturing, if applicable.]

AMC 145.65(b) (continued)

[c. In order to prevent omissions, every maintenance task or group of tasks should be signed-off. To ensure the task or group of tasks is completed, it should only be signed-off after completion. Work by not authorised personnel (i.e. temporary staff, trainee,...) should be checked by authorised personnel before they sign-off. The grouping of tasks for the purpose of signing-off should allow critical steps to be clearly identified

Note: A "sign-off" is a statement by the competent person performing or supervising the work, that the task or group of tasks has been correctly performed. A sign-off relates to one step in the maintenance process and is therefore different to the release to service of the aircraft. "Authorised personnel" means personnel formally authorised by the JAR 145 Maintenance Organisation to sign-off tasks. "Authorised personnel" are not necessarily "certifying staff" .

d.] The referenced procedure[s], if applicable, should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as item 2.23 [and 2.25] for aircraft base maintenance and L2.7 for line maintenance.

5 The maintenance procedures should address JAR 145.25 to JAR 145.95 inclusive as also specified in JAR-145.70 (a)(11) and sub-paragraphs (1) to (4) inclusive. The Appendix 2 example exposition contains typical procedures that , where appropriate should be addressed.

[6. Maintenance procedures should be held current such that they reflect best practice within the JAR-145 organisation. It is the responsibility of all JAR-145 organisation's employees to report any differences via their organisation's internal occurrence reporting mechanisms.

7. All procedures, and changes to those procedures, should be verified and validated before use where practicable.

8. All technical procedures should be designed and presented in accordance with good human factors principles].

[Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

AMC 145.65(c)(1)

Maintenance Procedures and Quality System

See JAR 145.65(c)(1)

1 The primary objectives of the quality system are to enable the JAR-145 approved maintenance organisation to ensure that it can deliver a safe product and that JAR-145 approved maintenance organisation remains in compliance with the requirements.

2 An essential element of the quality system is the independent audit.

3 The independent audit is an objective process of routine sample checks of all aspects of the JAR-145 approved maintenance organisation's ability to carry out all maintenance to the required standards and includes some product sampling as this is the end result of the maintenance process. It represents an objective overview of the complete maintenance related activities and is intended to complement the JAR-145.50(a) requirement for certifying staff to be satisfied that all required maintenance has been properly carried out before issue of the certificate of release to service. Independent audits should include a percentage of random audits carried out on a sample basis when maintenance is being carried out. This means some audits during the night for those organisations that work at night.

4 Except as specified in sub-paragraphs 7 and 9, the independent audit should ensure that all aspects of JAR-145 compliance are checked every 12 months and may be carried out as a complete single exercise or subdivided over the 12 month period in accordance with a scheduled plan. The independent audit does not require each procedure to be checked against each product line when it can be shown that the particular procedure is common to more than one product line and the procedure has been checked every 12 months without resultant findings. Where findings have been identified, the particular procedure should be rechecked against other product lines until the findings have been rectified after which the independent audit procedure may revert back to 12 monthly for the particular procedure.

5 Except as specified otherwise in sub-paragraphs 7, the independent audit should sample check one product on each product line every 12 months as a demonstration of the effectiveness of maintenance procedures compliance. It is recommended that procedures and product audits be combined by selecting a specific product example, such as an aircraft or engine or instrument and sample checking all the procedures and requirements associated with the specific product example to ensure that the end result should be an airworthy product.

AMC 145.65(c)(1) (continued)

For the purpose of the independent audit a product line includes any product under an Appendix 1 approval class rating as specified in the JAR-145 approval schedule issued to the particular organisation.

It therefore follows for example that a JAR-145 approved maintenance organisation with a capability to maintain aircraft, repair engines, brakes and autopilots would need to carry out 4 complete audit sample checks each year except as specified otherwise in subparagraphs 5, 7 or 9. Appendix 5 contains some examples of audit subjects and plans.

6 The sample check of a product means to witness any relevant testing and visually inspect the product and associated documentation. The sample check should not involve repeat disassembly or testing unless the sample check identifies findings requiring such action.

7 Except as specified otherwise in sub-paragraph 9, where the smallest JAR-145 approved maintenance organisation, that is an organisation with a maximum of 10 personnel actively engaged in maintenance, chooses to contract the independent audit element of the quality system in accordance with JAR-145.65(c)(1) it is conditional on the audit being carried out twice in every 12 month period.

8 Except as specified otherwise in sub-paragraph 9, where the JAR-145 approved maintenance organisation has line stations listed as per JAR-145.75(d) the quality system should describe how these are integrated into the system and include a plan to audit each listed line station at a frequency consistent with the extent of flight activity at the particular line station. Except as specified otherwise in sub-paragraph 9 the maximum period between audits of a particular line station should not exceed 24 months.

9 Except as specified otherwise in sub-paragraph 5, the JAA full member Authority may agree to increase any of the audit time periods specified in this AMC-145.65(c)(1) by up to 100% provided that there are no safety related findings and subject to being satisfied that the JAR-145 approved maintenance organisation has a good record of rectifying findings in a timely manner.

10 A report should be raised each time an audit is carried out describing what was checked and the resulting findings against applicable requirements, procedures and products.

11 The independence of the audit should be established by always ensuring that audits are carried out by personnel not responsible for the function, procedure or products being checked. It therefore follows that a large JAR-145 approved maintenance organisation, being an organisation with more than about 500 maintenance staff should have a dedicated quality audit group whose sole function is to conduct audits, raise finding reports and follow up to check that findings are being rectified. For the medium sized JAR-145 approved maintenance organisation, being an organisation with less than about 500 maintenance staff, it is acceptable to use competent personnel from one section/department not responsible for the production function, procedure or product to audit the section/department that is responsible subject to the overall planning and implementation being under the control of the quality manager. JAR-145 approved maintenance organisations with a maximum of 10 maintenance staff actively engaged in carrying out maintenance may contract the independent audit element of the quality system to another JAR-145 approved maintenance organisation or a competent person acceptable to the JAA full member Authority.

12 The referenced procedure should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as items 3.1 and 3.2.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

AMC 145.65(c)(2)

Maintenance Procedures and Quality System

See JAR 145.65(c)(2)

1 An essential element of the quality system is the quality feedback system.

2 The quality feedback system may not be contracted to outside persons. The principal function of the quality feedback system is to ensure that all findings resulting from the independent quality audits of the organisation are properly investigated and corrected in a timely manner and to enable the accountable manager to be kept informed of any safety issues and the extent of compliance with JAR-145.

3 The independent quality audit reports referenced in AMC 145.65(c)(1) sub-paragraph 10 should be sent to the relevant department(s) for rectification action giving target rectification dates. Rectification dates should be discussed with such department(s) before the quality department or nominated quality auditor confirms such dates in the report. The relevant department(s) are required by JAR-145.65(c)(2) to rectify findings and inform the quality department or nominated quality auditor of such rectification.

IEM 145.65(c)(2) (continued)

4 The accountable manager should hold regular meetings with staff to check progress on rectification except that in the large organisations such meetings may be delegated on a day to day basis to the quality manager subject to the accountable manager meeting at least twice per year with the senior staff involved to review the overall performance and receiving at least a half yearly summary report on findings of non-compliance.

5 All records pertaining to the independent quality audit and the quality feedback system should be retained for at least 2 years after the date of clearance of the finding to which they refer or for such periods as to support changes to the AMC 145.65(c)(1) sub-paragraph 9 audit time periods, whichever is the longer.

6 The referenced procedure should be specified in the Maintenance Organisation Exposition and for information can be found listed in the Appendix 2 example exposition as item 3.3.

[Amdt. 3, 01.04.01]

IEM 145.70(a)

Maintenance Organisation Exposition

See JAR 145.70(a)

1 The purpose of the Maintenance Organisation Exposition (MOE) is to set forth the procedures, means and methods of the Organisation.

2 Compliance with its contents will assure compliance with the JAR-145 requirements, which is a prerequisite to obtaining and retaining an approved maintenance organisation certificate.

3 JAR 145.70(a)(1) to (a)(11) constitutes the 'management' part of the MOE and therefore could be produced as one document and made available to the JAR 145.30(a) person(s) who should be reasonably familiar with its contents. JAR 145.70(a)(6) list of Certifying Staff may be produced as a separate document.

4 JAR 145.70(a)(12) constitutes the working procedures of the organisation and therefore as stated in the requirement may be produced as any number of separate procedures manuals. It should be remembered that these documents should be cross-referenced from the management MOE.

5 Personnel are expected to be familiar with those parts of the manuals that are relevant to the maintenance work they carry out.

6 The JAR-145 approved maintenance organisation will need to specify in the MOE who should amend the manual particularly in the case where there are several parts.

7 The Quality Manager should be responsible for monitoring the amendment of the MOE, unless otherwise agreed by the JAA full member Authority, including associated procedures manuals and submission of the proposed amendments to the JAA full member Authority unless said Authority has agreed via a procedure stated in the amendment section of the MOE that some defined class of amendments may be incorporated without prior Authority approval.

8 In reality, therefore, the MOE has to cover four main parts:

a. The management MOE covering the parts specified earlier.

b. The maintenance procedures covering all aspects of how aircraft components may be accepted from outside sources and how aircraft will be maintained to the required standard.

c. The quality system procedures including the methods of qualifying mechanics, inspection, certifying staff and quality audit personnel.

d. Contracted JAR-OPS operator procedures and paperwork.

9 The accountable manager's JAR-145.70(a)(1) exposition statement should embrace the intent of the following paragraph and in fact this statement may be used without amendment. Any modification to the statement should not alter the intent.

'This exposition and any associated referenced manuals defines the organisation and procedures upon which the (Authority*) JAR-145 Approval is based as required by JAR 145.70. These procedures are approved by the undersigned and must be complied with, as applicable, when work/orders are being progressed under the terms of the JAR-145 approval.'

IEM 145.70(a) (continued)

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

It is understood that the (Authority*) will approve this organisation whilst the (Authority*) is satisfied that the procedures are being followed and work standards maintained. It is further understood that the (Authority*) reserves the right to suspend, limit or revoke the JAR-145 approval of the organisation if the (Authority*) has evidence that procedures are not followed or standards not upheld.

Signed.....

Dated.....

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

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

NOTE: Where it states (Authority*) please insert the actual name of the Authority, for example, RLD, LBA, DGAC, CAA, etc., etc.

Whenever the accountable manager changes it is important to ensure that the new accountable manager signs the para 9 statement at the earliest opportunity as part of the acceptance by the JAA full member Authority.

Failure to carry out this action could invalidate the JAR-145 Approval.

[10] When an organisation is approved against any other JAR containing a requirement for an exposition, a supplement covering the differences will suffice to meet the requirements except that the supplement must have an index showing where those parts missing from the supplement are covered.

Appendix 2 contains one example of a MOE layout.

[Ch. 1,4.8.95; Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

IEM 145.80

Limitations on the Approved Maintenance Organisation

See JAR 145.80

This paragraph is intended to cover the situation where the larger JAR-145 organisation may temporarily not hold all the necessary tools, equipment etc., for an aircraft type or variant specified in the organisation's approval. This paragraph means that the JAA full member Authority need not amend the approval to delete the aircraft type or variants on the basis that it is a temporary situation and there is a commitment from the organisation to re-acquire tools, equipment etc. before maintenance on the type may recommence.

IEM 145.85

Change to the Approved Maintenance Organisation

See JAR 145.85

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

IEM 145.95(a)

Equivalent Safety Case

See JAR 145.95

Once a JAR-145.95 (a) equivalent safety case has been accepted by the JAA full member Authorities, it is intended that such equivalent safety cases be published by JAA Headquarters as amended JAR's or AMC's or initially as maintenance Temporary Guidance Leaflets (TGL's).

[Ch. 2, 10.7.98]

IEM 145.100

Revocation, Suspension, Limitation or Refusal to Renew the JAR-145 Approval Certificate

See JAR 145.100

The procedures for handling representations regarding revocation, suspension, limitation or refusal to renew the JAR-145 approval certificate are contained in JAA Administration & Guidance Material, Section Two - Maintenance, Part Two - Procedures.

[Ch. 2, 10.7.98]

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Appendix 1

Organisations Approval Class and Rating System

1. Except as stated otherwise for the smallest organisation in paragraph 13, Table 1 outlines the full extent of approval possible under JAR-145 in a standardised form. An organisation may be granted an approval ranging from a single class and rating with limitations to all classes and ratings with limitations.
2. In addition to table 1 the JAR-145 approved maintenance organisation is required by JAR 145.20 to indicate scope of work in the maintenance organisation exposition. JAR 145.70(a)(8) also refers to the same scope of work and it should be noted that a capability list is deemed to be one form of scope of work. See also paragraph 11.
3. Within the approval class(es) and rating(s) granted by the JAA full member Authority, the scope of work specified in the maintenance organisation exposition defines the exact limits of approval. It is therefore essential that the approval class(es) and rating(s) and the organisations scope of work are compatible.
4. A category A class rating means that the JAR-145 approved maintenance organisation may carry out maintenance on the aircraft and any component (including engines/APUs) only whilst such components are fitted to the aircraft except that such components can be temporarily removed for maintenance when such removal is expressly permitted by the aircraft maintenance manual to improve access for maintenance subject to a control procedure in the maintenance organisation exposition acceptable to the JAA full member Authority. The limitation section will specify the scope of such maintenance thereby indicating the extent of approval.
5. A category B class rating means that the JAR-145 approved maintenance organisation may carry out maintenance on the uninstalled engine/APU and engine/APU components only whilst such components are fitted to the engine/APU except that such components can be temporarily removed for maintenance when such removal is expressly permitted by the engine/APU manual to improve access for maintenance. The limitation section will specify the scope of such maintenance thereby indicating the extent of approval. A JAR-145 approved maintenance organisation with a category B class rating may also carry out maintenance on an installed engine during 'base' and 'line' maintenance subject to a control procedure in the maintenance organisation exposition acceptable to the JAA full member Authority. The maintenance organisation exposition paragraph 1.8 scope of work should reflect such activity where permitted by the JAA full member Authority.
6. A category C class rating means that the JAR-145 approved maintenance organisation may carry out maintenance on uninstalled components (excluding engines and APUs) intended for fitment to the aircraft or engine/APU. The limitation section will specify the scope of such maintenance thereby indicating the extent of approval. A JAR-145 approved maintenance organisation with a category C class rating may also carry out maintenance on an installed component during base and line maintenance or at an engine/APU maintenance facility subject to a control procedure in the maintenance organisation exposition acceptable to the JAA full member Authority. The maintenance organisation exposition paragraph 1.8 scope of work should reflect such activity where permitted by the JAA full member Authority.
7. A category D class rating is a self contained class rating not necessarily related to a specific aircraft, engine or other component. The D1 - Non Destructive [Testing (NDT)] rating is only necessary for a JAR-145 approved maintenance organisation that carries out [NDT] as a particular task for another organisation. A JAR-145 approved maintenance organisation with a class rating in A or B or C category may carry out [NDT] on products it is maintaining subject to the maintenance organisation exposition containing [NDT] procedures, without the need for a D1 class rating.
8. Category A class ratings are subdivided into 'Base' or 'Line' maintenance. A JAR 145 approved maintenance organisation may be approved for either 'Base' or 'Line' maintenance or both. It should be noted that a 'Line' facility located at a main base facility requires a 'Line' maintenance approval.
9. The 'limitation' section is intended to give the JAA full member Authority maximum flexibility to customise the approval to a particular organisation. Table 1 specifies the types of limitation possible and whilst maintenance is listed last in each class rating it is acceptable to stress the maintenance task rather than the aircraft or engine type or manufacturer, if this is more appropriate to the organisation. An example could be avionic systems installations and maintenance.
10. Table I makes reference to series, type and group in the limitation section of class A and B. Series means a specific type series such as Airbus 300 or 310 or 319 or Boeing 737-300 series or RB211-524 series etc. Type means a specific type or model such as Airbus 310-240 type or RB 211-524 B4 type etc.

Appendix 1 (continued)

Any number of series or types may be quoted. Group means for example Cessna single piston engined aircraft or Lycoming non-supercharged piston engines etc.

11. When a lengthy capability list is used which could be subject to frequent amendment, then such amendment should be in accordance with a procedure acceptable to the JAA full member Authority and included in the maintenance organisation exposition. The procedure should address the issues of who is responsible for capability list amendment control and the actions that need to be taken for amendment. Such actions include ensuring compliance with JAR-145 for products or services added to the list.

12. Table 2 identifies the ATA specification 100 chapter for the category C component rating.

13. A JAR-145 approved maintenance organisation which employs only one person to both plan and carry out all maintenance can only hold a limited scope of approval rating. The maximum permissible limits are:-

CLASS AIRCRAFT	RATING A2 AEROPLANES	PISTON ENGINED. LINE & BASE 5700 KG AND BELOW
CLASS AIRCRAFT	RATING A2 AEROPLANES	TURBINE ENGINED LINE 5700 KG AND BELOW
CLASS AIRCRAFT	RATING A3 HELICOPTERS	SINGLE ENGINED LINE & BASE LESS THAN 2730 KG
CLASS ENGINES	RATING B2 PISTON	LESS THAN 450 HP
CLASS COMPONENTS RATING C1 TO C20 OTHER THAN COMPLETE ENGINES OR APUs		AS PER CAPABILITY LIST
CLASS SPECIALISED D1 [NDT]		[NDT METHOD(S)] TO BE SPECIFIED

It should be noted that such an organisation may be further limited by the JAA full member Authority in the scope of approval dependant upon the capability of the particular organisation.

Appendix 1 (Continued)

TABLE 1

CLASS	RATING	LIMITATION	BASE	LINE
AIRCRAFT	A1 Aeroplanes/airships above 5700 kg	Will state aeroplane/airship series or type and/or the maintenance task(s).		
	A2 Aeroplanes/airships 5700 kg and below	Will state aeroplane/airship manufacturer or group or series or type and/or the maintenance tasks		
	A3 Helicopters	Will state helicopter manufacturer or group or series or type and/or the maintenance task(s)		
ENGINES	B1 Turbine	Will state engine series or type and/or the maintenance task(s)		
	B2 Piston	Will state engine manufacturer or group or series or type and/or the maintenance task(s)		
	B3 APU	Will state engine manufacturer or series or type and/or the maintenance task(s)		
COMPONENTS OTHER THAN COMPLETE ENGINES OR APUs	C1 Air Cond & Press	Will state aircraft type or aircraft manufacturer or component manufacturer or the particular component and/or cross refer to a capability list in the exposition and/or the maintenance task(s).		
	C2 Auto Flight			
	C3 Comms and Nav			
	C4 Doors - Hatches			
	C5 Electrical Power			
	C6 Equipment			
	C7 Engine - APU			
	C8 Flight Controls			
	C9 Fuel - Airframe			
	C10 Helicopter - Rotors			
	C11 Helicopter - Trans			
	C12 Hydraulic			
	C13 Instruments			
	C14 Landing Gear			
	C15 Oxygen			
	C16 Propellers			
	C17 Pneumatic			
	C18 Protection ice/rain/fire			
	C19 Windows			
	C20 Structural			
SPECIALISED SERVICES	D1 Non Destructive Testing	Will state particular [NDT method(s)]		

Appendix 1 (Continued)

TABLE 2

CLASS	RATING	ATA CHAPTERS
COMPONENTS OTHER THAN COMPLETE ENGINES OR APUs	C1 Air Cond & Press	21
	C2 Auto Flight	22
	C3 Comms and Nav	23 - 34
	C4 Doors - Hatches	52
	C5 Electrical Power	24 - 33
	C6 Equipment	25 - 38 - 45
	C7 Engine – APU	49 - 71 - 72 - 73 - 74 - 75 - 76 - 77 - 78 - 79 - 80 - 81 - 82 - 83
	C8 Flight Controls	27 - 55 - 57.40 - 57.50 -57.60 - 57.70
	C9 Fuel - Airframe	28
	C10 Helicopters - Rotors	62 - 64 - 66 - 67
	C11 Helicopter - Trans	63 - 65
	C12 Hydraulic	29
	C13 Instruments	31
	C14 Landing Gear	32
	C15 Oxygen	35
	C16 Propellers	61
	C17 Pneumatic	36 - 37
	C18 Protection ice/rain/fire	26 - 30
	C19 Windows	56
	C20 Structural	53 - 54 - 57.10 - 57.20 - 57.30

[Ch. 1, 4.8.95; Ch. 2, 10.7.98; Amdt. 3,01.04.01]

Appendix 2

Maintenance Organisation Exposition

The exposition should contain the information, as applicable, specified in this Appendix. The information may be presented in any subject order so long as all applicable subjects are covered. Where an organisation uses a different format, for example, to allow the exposition to serve for more than one JAR approval, then the exposition should contain a cross reference Annex using this list as an index with an explanation as to where in the exposition the subject matter can be found."

Small JAR-145 approved maintenance organisations may combine the various items to form a simple exposition more relevant to their needs.

PART 0 JAR OPS GENERAL ORGANISATION

This section reserved for those JAR-145 approved maintenance organisations who are also JAR-OPS operators.

The information to be contained in this section can be found in Appendix 1 to AMC OPS 1.905(a) for aeroplanes and in Appendix 1 to AMC OPS 3.905(a) for helicopters.

PART 1 MANAGEMENT

- 1.1 Corporate commitment by the accountable manager.
- 1.2 [Safety and Quality Policy].
- 1.3 Management personnel.
- 1.4 Duties and responsibilities of the management personnel.
- 1.5 Management Organisation Chart.
- 1.6 List of certifying staff.
- 1.7 Manpower resources.
- 1.8 General description of the facilities at each address intended to be approved.
- 1.9 Organisations intended scope of work.
- 1.10 Notification procedure to the JAA full member Authority regarding changes to the organisation's activities/approval/location/personnel.
- 1.11 Exposition amendment procedures [including], if applicable, delegated procedures.

PART 2 MAINTENANCE PROCEDURES

- 2.1 Supplier evaluation and subcontract control procedure.
- 2.2 Acceptance/inspection of aircraft components and material from outside contractors.
- 2.3 Storage, tagging and release of aircraft components and material to aircraft maintenance.
- 2.4 Acceptance of tools and equipment.
- 2.5 Calibration of tools and equipment.
- 2.6 Use of tooling and equipment by staff (including alternate tools).
- 2.7 Cleanliness standards of maintenance facilities.
- 2.8 Maintenance instructions and relationship to aircraft/aircraft component manufacturers' instructions including updating and availability to staff.
- 2.9 Repair procedure.
- 2.10 Aircraft maintenance programme compliance.

Appendix 2 (continued)

- 2.11 Airworthiness Directives procedure.
- 2.12 Optional modification procedure.
- 2.13 Maintenance documentation in use and completion of same.
- 2.14 Technical record control.
- 2.15 Rectification of defects arising during base maintenance.
- 2.16 Release to service procedure.
- 2.17 Records for the JAROPS operator.
- 2.18 Reporting of defects to the JAA/Operator/Manufacturer.
- 2.19 Return of defective aircraft components to store.
- 2.20 Defective components to outside contractors.
- 2.21 Control of computer maintenance record systems.
- 2.22 Control of man-hour planning versus scheduled maintenance work.
- 2.23 Control of critical tasks per AMC 145.65 (b)(4).
- 2.24 Reference to specific maintenance procedures such as -
 - Engine running procedures,
 - Aircraft pressure run procedures,
 - Aircraft towing procedures,
 - Aircraft taxiing procedures.
- [2.25 Procedures to detect and rectify maintenance errors
- 2.26 Shift/task handover procedures
- 2.27 Procedures for notification of maintenance data inaccuracies and ambiguities to the type certificate holder.]

PART L2 ADDITIONAL LINE MAINTENANCE PROCEDURES

- L2.1 Line maintenance control of aircraft components, tools, equipment etc.
- L2.2 Line maintenance procedures related to servicing/fuelling/de-icing etc.
- L2.3 Line maintenance control of defects and repetitive defects.
- L2.4 Line procedure for completion of technical log.
- L2.5 Line procedure for pooled parts and loan parts.
- L2.6 Line procedure for return of defective parts removed from aircraft.
- L2.7 Line procedure control of critical tasks per AMC 145.65 (b)(4).

PART 3 QUALITY SYSTEM PROCEDURES

- 3.1 Quality audit of organisation procedures.
- 3.2 Quality audit of aircraft.
- 3.3 Quality audit remedial action procedure.
- 3.4 Certifying staff qualification and training procedures.
- 3.5 Certifying staff records.
- 3.6 Quality audit personnel.
- 3.7 Qualifying inspectors.
- 3.8 Qualifying mechanics.

Appendix 2 (continued)

- 3.9 Aircraft or aircraft component maintenance tasks exemption process control.
- 3.10 Concession control for deviation from organisations' procedures.
- 3.11 Qualification procedure for specialised activities such as NDT welding etc.
- 3.12 Control of manufacturers' and other maintenance working teams.
- [3.13 Human Factors training procedure]

PART 4

- 4.1 Contracted JAR-OPS operators.
- 4.2 JAR-OPS operator procedures and paperwork.
- 4.3 JAR-OPS operator record completion.

PART 5

- 5.1 Sample of documents.
- 5.2 List of Sub-contractors as per JAR 145.75 (b).
- 5.3 List of Line maintenance locations as per JAR 145.75 (d).
- 5.4 List of contracted JAR-145 organisations as per JAR 145.70(a)(15).

PART 6 JAR-OPS MAINTENANCE PROCEDURES

This section is reserved for those JAR-145 approved maintenance organisations who are also JAR-OPS operators.

The details of such procedures can be found in Appendix 1 to AMC OPS 1.905 (a) for aeroplanes and in Appendix 1 to AMC OPS 3.905 (a) for helicopters.

PART 7 FAA SUPPLEMENTARY PROCEDURES FOR A FAR PART 145 REPAIR STATION

This section is reserved for those JAR-145 approved maintenance organisations who are also certificated as a FAA FAR Part 145 repair station.

The content of this Part reflects the differences between JAR-145 and FAR parts 43/145 which will change over time as harmonisation and experience with the FAA progresses.

AA Advisory Circular 145-7 Appendix 2 contains details of the Part 7 contents.

PART 8 TRANSPORT CANADA CIVIL AVIATION (TCCA) SUPPLEMENTARY PROCEDURES FOR A TCCA AM573 MAINTENANCE ORGANISATION

This section reserved for those JAR-145 approved maintenance organisations who are also approved as a TCCA AM 573 maintenance organisation.

The content of this Part reflects the difference between JAR-145 and AM 573 and will change over time as harmonisation and experience with Transport Canada Civil Aviation progresses.

TCCA Aircraft Maintenance & Manufacturing Staff Instruction MSI 10 Appendix A contains details of the Part 8 contents.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt. 5, 01.01.03]

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Appendix 3

The Authorised Release Certificate/JAA FORM ONE

A INTRODUCTION

This appendix only covers the use of JAA Form One for maintenance purposes. Attention is drawn to ACJ 21.163 which covers the use of JAA Form One for new manufacture.

1 PURPOSE AND SCOPE

The purpose of the Certificate is to [release] assemblies/items/components/parts (hereafter referred to as [‘item(s)’]) after manufacture and to release maintenance work carried out on [such items] under the approval of a [JAA] full member [Authority] and to allow [items] removed from one aircraft/aircraft component to be fitted to another aircraft/aircraft component.

The Certificate referenced JAA Form One is called the authorised release certificate.

The Certificate is to be used for export/import purposes, as well as for domestic purposes, and serves as an official certificate for [items] from the manufacturer/maintenance organisation to users. The certificate is not a delivery or shipping note.

It can only be issued by organisations approved by the particular NAA within the scope of the approval or by the National Aviation Authority itself.

The Certificate may be used as a rotatable tag by utilising the available space on the reverse side of the Certificate for any additional information and despatching the [item] with two copies of the Certificate so that one copy may be eventually returned with the [item] to the maintenance organisation. The alternative solution is to use existing rotatable tags and also supply a copy of the Certificate.

For maintenance activity, whilst the Certificate is primarily intended for use by JAR-145 approved maintenance organisations, provision has been made to allow use by non JAR-145 approved maintenance organisations in accordance with existing National Regulations - such as for general aviation and private operation.

Under no circumstances may a certificate be issued for any [item] when it is known that the [item has] a defect considered a serious hazard to flight safety.

A Certificate should not be issued for any [item] when it is known that the [item] is unserviceable except in the case of [an item] undergoing a series of maintenance processes at several JAR-145 approved maintenance organisations and the [item] needs a Certificate for the previous maintenance process carried out for the next JAR-145 approved maintenance organisation to accept the [item] for subsequent maintenance processes. As mentioned for Block 13, a clear statement of limitation should be endorsed in Block 13.

NOTE: Aircraft may not be released using the Certificate. For some NAAs, engines and propellers are excluded as these are released with airworthiness certificates issued by the NAA. Your NAA should be consulted on this point.

2 GENERAL

The Certificate should comply with the format attached including block numbers in that each block must be located as per the layout. The size of each block may however be varied to suit the individual application, but not to the extent that would make the Certificate unrecognisable. The overall size of the Certificate may be significantly increased or decreased so long as the certificate remains recognisable and legible. If in doubt consult your NAA.

All printing should be clear and legible to permit easy reading.

The Certificate should either be pre-printed or computer generated but in either case the printing of lines and characters must be clear and legible. Pre-printed wording is permitted in accordance with the attached model but no other certification statements are permitted. The national language of the country of origin of the NAA shall be printed below the English wording when required by the NAA.

Completion of the Certificate should be in English when it is used for export purposes, otherwise it can be completed in the national language.

The details to be entered on the Certificate can be either machine/computer printed or handwriting using block letters and should permit easy reading.

Abbreviations should be restricted to a minimum.

Appendix 3 (continued)

The space remaining on the reverse side of the Certificate may be used by the originator for any additional information but should not include any certification statement.

The original Certificate should accompany the [items] and correlation should be established between the Certificate and the [items]. A copy of the Certificate should be retained by the organisation that manufactured or maintained the [item]. Where the Certificate format and data is entirely computer generated, subject to acceptance by the NAA, it is permissible to retain the Certificate format and data on a secure database.

Where a single Certificate was used to release a number of [items] and those [items] are subsequently separated out from each other, such as through a parts distributor, then a copy of the original Certificate should accompany such [items] and the original Certificate should be retained by the organisation that received the batch of [items]. Failure to retain the original Certificate could invalidate the release status [of the items].

NOTE: There is no restriction in the number of copies of the Certificate sent to the customer or retained by the originator.

The Certificate that accompanies the [item] may be attached to the [item] by being placed in an envelope for durability.

3 COMPLETION OF THE RELEASE CERTIFICATE BY THE ORIGINATOR

Except as otherwise stated, there should be an entry in all blocks to make the document a valid certificate.

- Block 1 [The name and country of the National Aviation Authority under whose approval the certificate was issued. This information may be pre-printed.]
- Block 2 [Pre-printed "Authorised Release Certificate/JAA Form One".]
- Block 3 A unique number should be pre-printed in this block for Certificate control and traceability purposes except that in the case of a computer generated document, the unique number need not be pre-printed where the computer is programmed to produce the number.
- Block 4. The full name and address [plus mailing address if different] of the [approved] organisation releasing the [items] covered by this certificate. This block may be pre-printed. Logos, etc., are permitted if the logo can be contained within the block.
- Block 5 Its purpose is to reference work order/contract/invoice or any other internal organisational process such that a fast traceability system can be established.
- Block 6 This block is provided for the convenience of the organisation issuing the Certificate to permit easy cross-reference to the 'Remarks' Block 13 by the use of item numbers. Completion is not mandatory.

Where a number of items are to be released on the Certificate, it is permissible to use a separate listing cross-referring Certificate and list to each other.

- Block 7 The name or description of the [item] should be given. Preference should be given to use of the Illustrated Parts Catalogue (IPC) designation.
- Block 8 State the Part Number. Preference should be given to use of the IPC number designation.
- Block 9 Used to indicate the Type-Approved products for which the released [items] are eligible for installation. Completion of block is optional but if used, the following entries are permitted:
- a) The specific or series aircraft, engine, propeller or auxiliary power unit model, or a reference to a readily available catalogue or manual which contains such information, for example: 'A300'.
 - b) 'Various', if known to be eligible for installation on more than one model of Type-Approved product, unless the originator wishes to restrict usage to a particular model installation when it should so state.
 - c) 'Unknown', if eligibility is unknown, this category being primarily for use by maintenance organisations

NOTE: Any information in Block 9 does not constitute authority to fit the [item] to a particular aircraft, engine, propeller or auxiliary power unit. The User/installer should confirm via documents such as the Parts Catalogue, Service Bulletins, etc. that the [item] is eligible for the particular installation.

Appendix 3 (continued)

Block 10 State the number of [items] being released.

Block 11 State the [item] Serial Number [and/] or Batch Number if applicable, if neither [is] applicable, state "N/A".

Block 12 The following words in quotation marks, with their definitions, indicate the status of the [item] being released. One or a combination of these words should be stated in this block:

1 'OVERHAULED'

The restoration of a used [item] by inspection, test and replacement in conformity with an approved standard (*) to extend the operational life.

2 'INSPECTED/TESTED'

The examination of [an item] to establish conformity with an approved standard (*).

3 'MODIFIED'

The alteration of [an item] in conformity with an approved standard (*).

4 'REPAIRED'

The restoration of [an item] to a serviceable condition in conformity with an approved standard (*).

5 'RETREADED'

The restoration of a used tyre in conformity with an approved standard (*).

6 'REASSEMBLED'

The reassembly of [an item] in conformity with an approved standard (*).

Example: A propeller after transportation.

NOTE: This provision should only be used in respect of [items] which were originally fully assembled by the manufacturer in accordance with manufacturing requirements such as, but not limited to, JAR-21.

(*) Approved Standard means a manufacturing/design/maintenance/quality standard approved by the NAA

Approved by the NAA means approved by your NAA or in accordance with a procedure approved by your NAA.

The above statements should be supported by reference in Block 13 to the approved data/manual/specification used during maintenance.

Block 13 It is mandatory to state any information in this block either direct or by reference to supporting documentation that identifies particular data or limitations relating to the [items] being released that are necessary for the User/installer to make the final airworthiness determination of the [item]. Information should be clear, complete, and provided in a form and manner which is adequate for the purpose of making such a determination.

Each statement should be clearly identified as to which item it relates.

If there is no statement, state 'None'.

Some examples of the information to be quoted are as follows:

- The identity and issue of maintenance documentation used as the approved standard.
- Airworthiness Directives carried out and/or found carried out, as appropriate.
- Repairs carried out and/or found carried out, as appropriate.
- Modifications carried out and/or found carried out, as appropriate.
- Replacement parts installed and/or parts found installed, as appropriate.
- Life limited parts history.
- Deviations from the customer work order.
- Identity of national regulation if not JAR-145.
- Release statements to satisfy a foreign maintenance requirement.
- Release statements to satisfy the conditions of an international maintenance agreement such as, but not limited to, the Canadian Technical Arrangement Maintenance and the USA Bilateral Aviation Safety Agreement - Maintenance Implementation Procedure.

Appendix 3 (continued)

NOTE: The latter two statements allow the possibility of dual release against both JAR-145 and a foreign maintenance requirement or the single release by a JAR-145 approved maintenance organisation against a foreign maintenance requirement. However care should be exercised to tick the relevant box(es) in block 19 to validate the release. It should also be noted that the dual release requires the approved data to be approved / accepted by both the NAA and the appropriate foreign NAA and the single release requires the approved data to be approved / accepted only by the appropriate foreign NAA.

Blocks 14, 15, 16, 17 & 18:

Must not be used for maintenance tasks by JAR-145 approved maintenance organisations. These blocks are specifically reserved for the release/certification of newly manufactured [items] in accordance with JAR-21 and national aviation regulations in force prior to JAR-21 becoming fully effective.

Block 19 Contains the required JAR 145.50(a) release to service statement for all maintenance by JAR-145 approved maintenance organisations. When non JAR-145 maintenance is being released block 13 should specify the particular national regulation. In any case the appropriate box should be 'ticked' to validate the release.

The certification statement 'except as otherwise specified in block 13' is intended to address the following situations;

- (a) The case where the maintenance could not be completed.
- (b) The case where the maintenance deviated from the standard required by JAR-145.
- (c) The case where the maintenance was carried out in accordance with a non JAR-145 requirement.

Whichever case or combination of cases should be specified in block 13.

Block 20 For the signature of the certifying staff authorised by the JAR-145 approved maintenance organisation. This signature can be computer printed subject to the NAA being satisfied that only the signatory can direct the computer and that a signature is not possible on a blank computer generated form.

Block 21 The JAR-145 approved maintenance organisation reference number given by the NAA [].

Block 22 The printed name of the Block 20 signatory and personal authorisation reference.

Block 23 The date of signing the Block 19 release to service. [(d/m/y). The month should appear in letters e.g. Jan, Feb, Mar etc. The release to service should be signed at the "completion of maintenance".]

Please note the User Responsibility Statements are on the reverse of this Certificate. These statements may be added to the front of the Certificate below the bottom line by reducing the depth of the form.

4 EFFECTIVITY

a. Except as stated in paragraph (b) the JAA Form One published in the first issue of JAR-145 dated 30 July 1991 should be used for the release of all parts from the date that the maintenance organisation received its' JAR-145 approval.

b. Issue [] [4] of JAA Form One should be used for the release of all [items] from [01 November 2002] but may be used prior to [that date] if available to the JAR 145 approved maintenance organisation [and approved by the relevant JAA full member Authority].

1. Approving National Aviation Authority / Country		2. AUTHORISED RELEASE CERTIFICATE JAA FORM ONE				3. Form Tracking Number	
4. Approved Organisation Name and Address:						5. Work Order/Contract/Invoice	
6. Item	7. Description	8. Part No.	9. Eligibility*	10. Qty.	11. Serial/Batch No.	12. Status/Work	
13. Remarks							
14. Certifies that the items identified above were manufactured in conformity to: <input type="checkbox"/> approved design data and are in condition for safe operation <input type="checkbox"/> non-approved design data specified in block 13				19. <input type="checkbox"/> JAR-145.50 Release to Service <input type="checkbox"/> Other regulation specified in block 13 Certifies that unless otherwise specified in block 13, the work identified in block 12 and described in block 13, was accomplished in accordance with JAR 145 and in respect to that work the items are considered ready for release to service.			
15. Authorised Signature		16. Approval/ Authorisation Number		20. Authorised Signature		21. Certificate/Approval Ref. No.	
17. Name		18. Date (d/m/y)		22. Name		23. Date (d/m/y)	

AUTHORISED RELEASE CERTIFICATE - JAA FORM ONE

USER/INSTALLER RESPONSIBILITIES

NOTE:

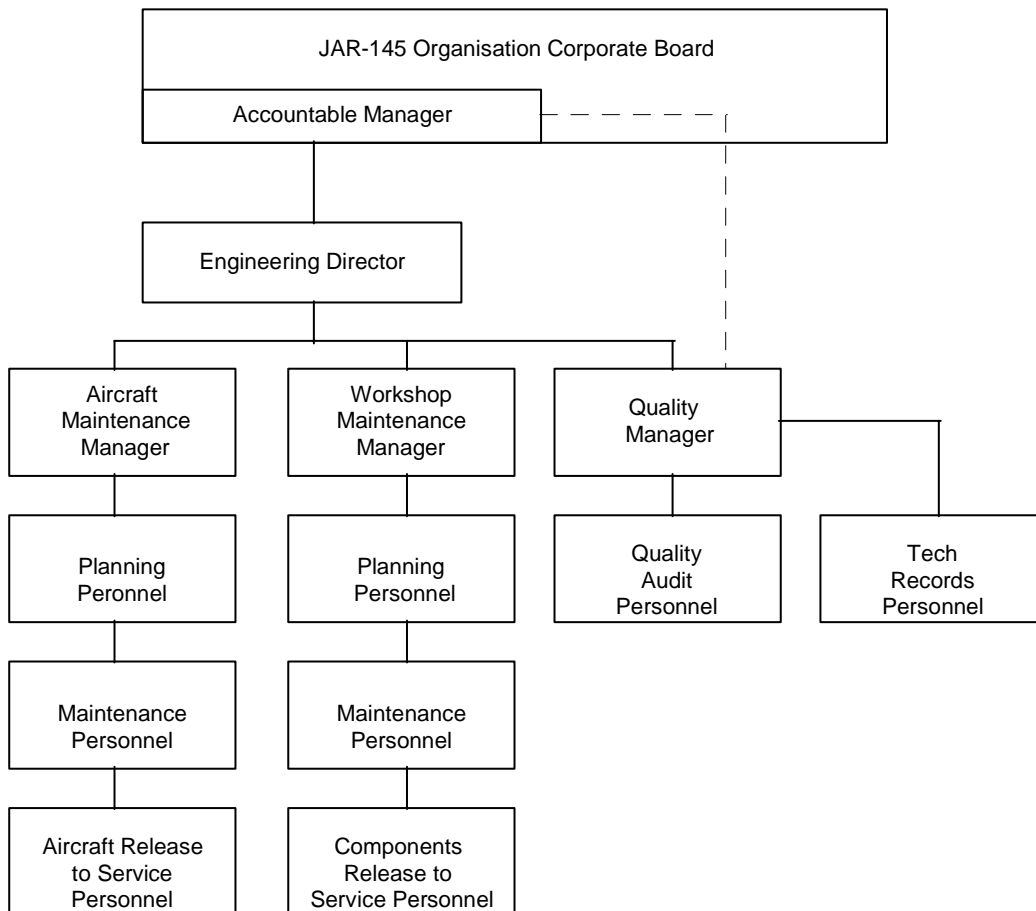
1. It is important to understand that the existence of the Document alone does not automatically constitute authority to install the part/component/assembly.
2. Where the user/installer works in accordance with the national regulations of an Airworthiness Authority different from the Airworthiness Authority specified in block [1] it is essential that the user/installer ensures that his/her Airworthiness Authority accepts parts/components/assemblies from the Airworthiness Authority specified in block [1].
3. Statements 14 and 19 do not constitute installation certification. In all cases the aircraft maintenance record must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.

[Ch. 1, 4.8.95; Ch. 2, 10.7.98; Amdt. 3, 01.04.01; Amdt 4, 01.11.01]

Appendix 4

Some Outline Examples of Organisational Structures possible under JAR-145

A. TYPICAL LARGE ORGANISATION

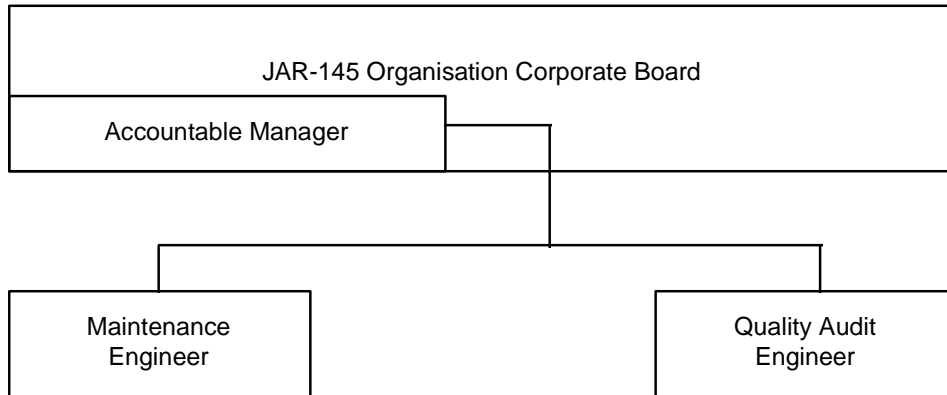


1 The Engineering Director may be the accountable manager if it is a Corporate Board position and meets the other requirements for accountable manager. Typically such a position is entitled Vice President (Engineering)

2 Quality Audit personnel must remain independent of the Maintenance Manager. Release to Service personnel may report instead to the quality Manager position.

3 Technical records personnel may report instead to the Aircraft (Workshop) Manager.

B. TYPICAL SMALL ORGANISATION



Appendix 5 (continued)

Appendix 5

Example Quality Audit Plans

1 PURPOSE

1.1 The purpose of this Appendix is to give guidance on just one acceptable working audit plan to meet part of the needs of JAR 145.65 (b). **There are any number of other acceptable working audit plans.**

1.2 The proposed plan lists the subject matter that should be covered by the audit and attempts to indicate applicability in the various types of workshops and aircraft facilities. The list should therefore be tailored for the particular situation and more than one list may be necessary. Each list should be shown against a timetable to indicate when the particular item is scheduled for audit and when the audit was completed.

REF	SUBJECT	HANGAR	ENGINE Workshop	MECH Workshop	AVIONIC Workshop
145.25	(a) Facilities-size & segregation	yes	yes	yes	yes
	(b) Office accommodation	yes	yes	yes	yes
	(c) Work environment	yes	yes	yes	yes
	(d) Storage	yes	yes	yes	yes
145.30	(a) Management changes	yes	yes	yes	yes
	(b) Staff Nos & manhour plan	yes	yes	yes	yes
	(c) Competence process	yes	yes	yes	yes
	(d) Qualifying certifying staff	yes	yes	yes	yes
145.35	(a) Records of certifying staff	yes	yes	yes	yes
	(b) Issue of authorisations	yes	yes	yes	yes
145.40	(a) Adequate equipment	yes	yes	yes	yes
	(b) Equipment control & cal	yes	yes	yes	yes
145.45	(a)(b) Approved data held	yes	yes	yes	yes
	(c) Modified maint data	yes	yes	yes	yes
	(d) Data availability	yes	yes	yes	yes
	(e) Data up to date	yes	yes	yes	yes
145.50	(a) Aircraft release	yes	no	no	no
	(a) Comp release-JAA Form 1	no	yes	yes	yes
	(b) Release doc contents	yes	yes	yes	yes
	(c) Pre 145 release control	no	yes	yes	yes
145.55	(a) Details on work docs	yes	yes	yes	yes
	(b) Operator's copy of release	yes	if appl	if appl	if appl
	(c) 2 year record retention	yes	yes	yes	yes
145.60	Reporting unairworthy findings	yes	yes	yes	yes
145.65	(a) Clear work orders	yes	yes	yes	yes
	(a) Procedures per exposition				
2.1	Suppliers & subcontractors	yes	yes	yes	yes
2.2	Acceptance of parts	yes	yes	yes	yes
2.3	Parts control in stores	yes	yes	yes	yes
2.6	Use of tools	yes	yes	yes	yes
2.7	Cleanliness standards	yes	yes	yes	yes
2.9	Control of repairs	yes	yes	yes	yes
2.10	A/C Maint programme compl	yes	no	no	no
2.11	Airworthiness directive control	yes	yes	yes	yes
2.12	Control of modificationsyes	yes	yes	yes	
2.13	Control of working docs	yes	yes	yes	yes
2.15	Base maintenance defects	yes	no	no	no
2.19	Defective parts to stores	yes	yes	yes	yes
2.20	Parts to outside contractors	yes	yes	yes	yes
2.21	Computer maint systems	if appl	if appl	if appl	if appl
2.22	Engine running	yes	yes	no	no
2.22	Aircraft procedures	yes	no	no	no
L2.1	Line maint control parts etc	if appl	no	no	no

L2.2	Line servicing control	if appl	no	no	no
L2.3	Line defect control	if appl	no	no	no
L2.4	Tech log completion	if appl	no	no	no
L2.5	Pool & loan parts	if appl	no	no	no
L2.6	Return defective parts to base	if appl	no	no	no
3.9	Product maint exemption contl	if appl	if appl	if appl	if appl
3.10	Procedures deviation control	if appl	if appl	if appl	if appl
3.11	Special services control (NDI)	if appl	if appl	if appl	no
3.12	Contractors working teams	yes	yes	no	no
145.65	(b) Product audit	yes	yes	yes	yes
145.70	Exposition up to date	yes	yes	yes	yes
145.75	Privileges and locations control	yes	yes	yes	yes
145.80	Limitation control	yes	yes	yes	yes
145 85	Control of changes	yes	yes	yes	yes

Note 1: "if appl" means if applicable or relevant.

Note 2: In the line station case all line stations should be audited at the frequency agreed by the JAA full member Authority within the limits of AMC-145.65(b)."

Note 3: If the JAR-145 approved maintenance organisation is also certificated by the FAA in accordance with the provisions of a Bilateral Aviation Safety Agreement including Maintenance Implementation Procedures (BASA-MIP), the working audit plan needs to be extended to include the items specified in FAA Advisory Circular AC 145-7 Appendix 2.

Note 4: If the JAR-145 approved maintenance organisation is also certificated by Transport Canada Civil Aviation (TCCA) in accordance with the provisions of the Technical Arrangement - Maintenance (TA-M), the working audit plan needs to be extended to include the items specified in TCCA Aircraft Maintenance and Manufacturing Staff Instruction MSI 10 Appendix A.

Note 5: The reference system used for this example working audit plan relates either to the JAR-145 paragraphs or the Appendix 2 Maintenance Organisation Exposition (MOE) items. Where an MOE item has been omitted it is due to the existence of a clear JAR-145 paragraph covering the same issue. JAR-145 paragraphs have priority due to being the primary requirement

[Ch. 2, 10.7.98]

Appendix 6 (continued)

Appendix 6

Non JAR-145 Organisations Working Under the Quality System of a JAR-145 Approved Maintenance Organisation (Sub-contracting).

1 INTRODUCTION

1.1 JAR 145.1 (b),(c) and (e) permits an organisation that is not appropriately approved in accordance with JAR-145 to carry out certain maintenance under the quality system of an appropriately approved JAR-145 organisation. AMC 145.1 and this Appendix provides an acceptable means of compliance.

1.2 As working under the quality system of a JAR-145 approved maintenance organisation is more commonly referred to as sub-contracting, this latter phrase will be used throughout this Appendix.

2 EFFECTIVITY

2.1 This Appendix becomes effective on 10 July 1998 (the effective date)

2.2 For the period of two years following the effective date (the transition period), the JAR-145 approved maintenance organisation's sub-contract control procedure may be in accordance with either this Appendix or JAR-145 Change 1 during the transition period.

2.3 After 10 July 2000, sub-contract control procedures should be in accordance with this Appendix.

3 FUNDAMENTALS OF JAR-145 SUB-CONTRACTING

3.1 The fundamental reasons for allowing a JAR-145 approved maintenance organisation to sub-contract certain maintenance tasks are:

(a) To permit the acceptance of specialised maintenance services, such as, but not limited to, plating, heat treatment, plasma spray, fabrication of specified parts for minor repairs / modifications, etc., without the need for direct JAA full member Authority approval in such cases.

(b) To permit the acceptance of aircraft maintenance up to but not including a base maintenance check as specified in JAR-145.1(e) by organisations not appropriately JAR-145 approved when it is unrealistic to expect direct JAA full member Authority approval. The Authority will determine when it is unrealistic but in general it is considered unrealistic if only one or two JAR-145 approved maintenance organisations intend to use the sub-contract organisation.

(c) To permit the acceptance of component maintenance.

(d) To permit the acceptance of engine maintenance up to but not including a workshop maintenance check or overhaul of an engine or engine module as specified in JAR-145.1(e) by organisations not appropriately JAR-145 approved when it is unrealistic to expect direct JAA full member Authority approval. The determination of unrealistic is as per sub-paragraph (b).

3.2 When maintenance is carried out under the sub-contract control system it means that for the duration of such maintenance, the JAR-145 approval has been temporarily extended to include the sub-contractor. It therefore follows that those parts of the sub-contractor's facilities, personnel and procedures involved with the JAR-145 approved maintenance organisation's products undergoing maintenance should meet JAR-145 requirements for the duration of that maintenance and it remains the JAR-145 organisation's responsibility to ensure such requirements are satisfied.

3.3 For the criteria specified in sub-paragraph 3.1 the JAR-145 approved maintenance organisation is not required to have complete facilities for maintenance that it needs to sub-contract but it should have its own expertise to determine that the sub-contractor meets the necessary standards. However a JAR-145 approved maintenance organisation cannot be approved unless it has the in house facilities, procedures and expertise to carry out the majority of maintenance for which it wishes to be approved in terms of the number of class ratings.

3.4 The JAR-145 approved maintenance organisation may find it necessary to include several specialist sub-contractors to enable it to be approved to completely certify the release to service of a particular product. Examples could be specialist welding, electro-plating, painting etc. To authorise the use of such subcontractors, the JAA full member Authority will need to be satisfied that the JAR-145 approved maintenance organisation has the necessary expertise and procedures to control such sub-contractors.

3.5 A JAR-145 approved maintenance organisation working outside the scope of its approval schedule is deemed to be not approved. Such an organisation may in this circumstance operate only under the sub-contract control of another appropriately approved JAR-145 organisation.

3.6 JAR 145.1 (e) limits the extent of sub-contracting.

3.7 Authorisation to sub-contract is indicated by the JAA full member Authority accepting the maintenance organisation exposition containing a specific procedure on the control of sub-contractors as per Appendix 2 item 2.1 and maybe item 2.2 plus a list of sub-contractors as required by JAR 145.70 (a)(13) and JAR 145.75 (b) and detailed in Appendix 2 item 5.2.

4 PRINCIPAL JAR-145 PROCEDURES FOR THE CONTROL OF SUB-CONTRACTORS NOT JAR-145 APPROVED

4.1 A pre audit procedure should be established whereby the JAR-145 approved maintenance organisations' subcontract control section, which may also be the JAR 145.65(b) quality system independent audit section, should audit a prospective sub-contractor to determine whether those services of the sub-contractor that it wishes to use meets the intent of JAR-145.

4.2 The JAR-145 approved maintenance organisation needs to assess to what extent it will use the sub-contractor's facilities. As a general rule the JAR-145 approved maintenance organisation should require its own paperwork, approved data and material/spare parts to be used, but it could permit the use of tools, equipment and personnel from the sub-contractor as long as such tools, equipment and personnel meet the requirement of JAR-145. In the case of sub-contractors who provide specialised services it may for practical reasons be necessary to use their specialised services personnel, approved data and material subject to acceptance by the JAR-145 approved maintenance organisation. Specialised service personnel should meet any published JAR qualification standard except that where no JAR qualification standard is published, existing national requirements should be followed.

4.3 Unless the sub-contracted maintenance work can be fully inspected on receipt by the JAR-145 approved maintenance organisation it will be necessary for such JAR-145 approved maintenance organisation to supervise the inspection and release from the sub-contractor. Such activities should be fully described in the JAR-145 approved maintenance organisation procedure. The JAR-145 approved maintenance organisation will need to consider whether to use its own staff or authorise the sub-contractor's staff.

4.4 The certificate of release to service may be issued either at the sub-contractor or at the JAR-145 facility by staff issued a certifying staff certification authorisation in accordance with [JAR 145.30 (d) to (g), as appropriate,] by the JAR-145 approved maintenance organisation. Such staff would normally come from the JAR-145 approved maintenance organisation but may otherwise be a person from the sub-contractor who meets the JAR-145 approved maintenance organisation certifying staff standard which itself is approved by the JAA full member Authority via the maintenance organisation exposition. The certificate of release to service and the JAA Form One will always be issued under the JAR-145 approved maintenance organisation approval reference.

4.5 The sub-contract control procedure will need to record audits of the sub-contractor, to have a corrective action follow up plan and to know when sub-contractors are being used. The procedure should include a clear revocation process for sub-contractors who do not meet the JAR-145 approved maintenance organisation's requirements.

4.6 The JAR-145 quality audit staff will need to audit the sub-contract control section and sample audit sub-contractors unless this task is already carried out by the quality audit staff as stated in sub-paragraph 4.1.

4.7 The contract between the JAR-145 approved maintenance organisation and the sub-contractor should contain a provision for the JAA full member Authority staff and JAA maintenance standardisation team (mast) staff to have right of access to the sub-contractor.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

Appendix 7

JAA Full Member Authorities

Reference is made in JAR-145 to the JAA full member Authorities and the following list constitutes the States of the JAA full member Authorities, except that it is possible for a candidate member to achieve full member status and be missing from this list until the next amendment of JAR-145. Reference should therefore be made to JAA Headquarters for the latest situation between reissues of this Appendix.

AUSTRIA	LUXEMBOURG
BELGIUM	[MALTA]
DENMARK	MONACO
FINLAND	NETHERLANDS
FRANCE	NORWAY
GERMANY	PORTUGAL
GREECE	SPAIN
ICELAND	SWEDEN
IRELAND	SWITZERLAND
ITALY	UNITED KINGDOM

Note. All JAR-145 approvals issued by the JAA member Authority of the above States are recognised and listed by the JAA Headquarters in a publication entitled 'JAA Listed JAR-145 Organisations'. In addition any USA FAR-145 repair station or Canadian AM 573 maintenance organisation approved/ accepted by JAA Headquarters will also be listed in the referenced publication as an acceptable source of maintenance. However it should be noted that only 25% of USA FAR-145 repair stations are currently listed as acceptable sources.

[Ch. 2, 10.7.98; Amdt. 3, 01.04.01]

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Appendix 8

JAR-FAR Comparison Information

The following tables are provided to assist interested persons in establishing the relationship of JAR-145 to FARs and vice versa.

It should be noted that in most cases the relationship indicates the intent of the subject covered and not a word for word comparison.

Where a paragraph appears more than once, it means that the intent of a paragraph has been split between several paragraphs.

TABLE 1: JAR-145 to FAR

JAR	EQUIVALENT FAR
145.1	43.1 and 145.3
145.3	not relevant to FAR
145.5	1.1
145.10	145.1, 145.13 and 145.71
145.15	145. 11
145.20	145. 11
145.25	145.35 and 145.37
145.30	43.3, 145.41, 145.43 and 145.75
145.35	145. 43
145.40	145.39, 145.47, 145.49 and 145.57
145.45	145 .57 and 43.13
145.50	43.2, 43.5, 43.7, 43.9, 43.11, 43.12, 43.13, 43.15 and 43.16, also 145.2, 145.45 and 145.59
145.55	145.61 and 145.79
145.60	145.63 and 145.79
145.65	145.45
145.70	145.43 and 145.45
145.75	145.51 and 145.73
145.80	145.53
145.85	145.15 and 145.21
145.90	145.17, 145.23, 145.55 and 145.77
145.95	11.21
145.100	11

TABLE 2: FAR PART 43 to JAR-145

FAR	EQUIVALENT JAR
43.1	145.1
43.2	145.50
43.3	145.30
43.5	145.50
43.7	145.50
43.9	145.50
43.11	145.50
43.12	145.50
43.13	145.50
43.15	145.50
43.16	145.50
43.17	Not applicable to JAR, but JAR 145.10 covers principle.

TABLE 3: FAR PART 145 to JAR-145

FAR	EQUIVALENT JAR
145.1	145.10 but no special provisions for Manufacturer
145.2	145.50 and 145.70 by implication but JAR-OPS 1 (3) Subpart M will cover
145.3	145.1
145.11	145.15
145.13	145.10
145.15	145.85
145.17	145.90
145.19	Not incorporated
145.21	145.85
145.23	145.90
145.25	Not incorporated
145.31	Appendix 1
145.33	Appendix 1
145.35	145.25
145.37	145.25
145.39	145.40
145.41	145.30
145.43	145.30, 145.35 and 145.70
145.45	145.30, 145.65 and 145.70
145.47	145.40
145.49	145.40
145.51	145.75
145.53	145.80
145.55	145.90
145.57	145.45 and 145.40
145.59	145.50
145.61	145.55
145.63	145.60
145.71	145.10
145.73	145.75
145.75	145.30
145.77	145.90
145.79	145.55 and 145.60
145.101	Not incorporated } Manufacturers required
145.103	Not incorporated } to meet requirements
145.105	Not incorporated } of JAR-145

[Appendix 9**Training Syllabus for initial Human Factors training**

The Training Syllabus below identifies the topics and subtopics to be addressed during the Human Factors training.

The maintenance organisation may combine, divide, change the order of any subject of the syllabus to suit its own needs, so long as all subjects are covered to a level of detail appropriate to the organisation and its personnel.

Some of the topics may be covered in separate training (health and safety, management, supervisory skills, etc.) in which case duplication of training is not necessary.

Where possible practical illustrations and examples should be used, especially accident and incident reports

Topics should be related to existing legislation where relevant (JAA/NAA/EU)

Topics should be related to existing guidance/advisory material where relevant (eg. ICAO HF Digests and Training Manual)

Topics should be related to maintenance engineering where possible; too much unrelated theory should be avoided.

1 General / Introduction to human factors

- 1.1 Need to address Human Factors
- 1.2 Statistics
- 1.3 Incidents

2 Safety Culture / Organisational factors**3 Human Error**

- 3.1 Error models and theories
- 3.2 Types of errors in maintenance tasks
- 3.3 Violations
- 3.4 Implications of errors
- 3.5 Avoiding and managing errors
- 3.6 Human Reliability

4 Human Performance & Limitations

- 4.1 Vision
- 4.2 Hearing
- 4.3 Information-Processing
- 4.4 Attention and Perception
- 4.5 Situational awareness
- 4.6 Memory
- 4.7 Claustrophobia and physical access
- 4.8 Motivation
- 4.9 Fitness/Health
- 4.10 Stress
- 4.11 Workload management
- 4.12 Fatigue
- 4.13 Alcohol, medication, drugs
- 4.14 Physical work
- 4.15 Repetitive tasks / complacency

5 Environment

- 5.1 Peer pressure
- 5.2 Stressors
- 5.3 Time pressure and deadlines]

Appendix 9 (continued)

- [5.4 Workload
 - 5.5 Shift Work
 - 5.6 Noise and fumes
 - 5.7 Illumination
 - 5.8 Climate and temperature
 - 5.9 Motion and vibration
 - 5.10 Complex systems
 - 5.11 Hazards in the workplace
 - 5.12 Lack of manpower
 - 5.13 Distractions and interruptions
- 6 Procedures, Information, Tools and Practices**
- 6.1 Visual Inspection
 - 6.2 Work logging and recording
 - 6.3 Procedure – practice / mismatch / Norms
 - 6.5 Technical documentation – access and quality
- 7 Communication**
- 7.1 Shift / Task Handover
 - 7.2 Dissemination of information
 - 7.3 Cultural differences
- 8 Teamwork**
- 8.1 Responsibility
 - 8.2 Management, supervision and leadership
 - 8.3 Decision making
- 9 Professionalism and integrity**
- 9.1 Keeping up to date; currency
 - 9.2 Error provoking behaviour
 - 9.3 Assertiveness
- 10 Organisation's HF Program**
- 10.1 Reporting errors
 - 10.2 Disciplinary policy
 - 10.3 Error investigation
 - 10.4 Action to address problems
 - 10.5 Feedback]

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