Hong Kong Aviation Requirements

HKAR-1

Airworthiness Procedures

Issue 2 Revision 14
29 September 2017

CAD 554

Civil Aviation Department
Hong Kong, CHINA
 HKAR-1

Enquires on the contents of the Hong Kong Aviation Requirements should be addressed to:

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Please note that the HKAR-1 (Airworthiness Procedures) is available at CAD website:
http://www.cad.gov.hk

Hardcopies will not be published.
CONTENTS

Hong Kong Aviation Requirements

HKAR-1

Airworthiness Procedures

<table>
<thead>
<tr>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
</tr>
<tr>
<td>Checklist of Pages</td>
</tr>
<tr>
<td>Preambles</td>
</tr>
</tbody>
</table>

Section 1.1 General
1.1-2 Categories of Aircraft
1.1-3 Non-Compliance Findings

Section 1.2 Approval of the Type Design
1.2-2 Type Certification
   Appendix No. 1 — Hong Kong Airworthiness Standards for Type Certification of an Aircraft
1.2-3 Flight Testing for Type Certification or Validation/Acceptance
   Appendix No. 1 — Flight Test Schedule for Type Certification or Validation/Acceptance
1.2-4 Type Certification or Validation/Acceptance of a Variant

Section 1.3 Certificates of Airworthiness and other Provisions for Legal Flight
1.3-2 Issue of Certificates of Airworthiness
1.3-3 Flight Testing for Issue of a Certificate of Airworthiness or a Permit to Fly
   Appendix No. 1 — Flight Test Schedules for Issue and Renewal of Certificates of Airworthiness
1.3-4 Renewal of Certificate of Airworthiness

1.3-5 Flight Testing for Renewal of Certificates of Airworthiness or Permits to Fly

1.3-6 Statement of Conformity for Export from Hong Kong

1.3-8 'A Conditions'

1.3-9 'B Conditions'

1.3-11 Aircraft Radio Installations

Section 1.4 Design and Manufacture of Products other than Aircraft

1.4-2 Type Validation/Acceptance of Engines and Associated Equipment

   Appendix No. 1 — Engines and Associated Equipment

1.4-4 Type Certification or Validation/Acceptance of Propellers

1.4-8 Design Approval of Aircraft Equipment and Accessories

1.4-10 Radio Apparatus

   Appendix No. 1 — Hong Kong Standard for Approval of Aircraft Radio Apparatus

Section 1.5 Continued Airworthiness — Responsibilities of the Type Design Organisation

1.5-2 Maintenance Review Board / Maintenance Type Board

1.5-3 Maintenance, Overhaul and Repair Manuals

1.5-4 Weight and Balance of Aircraft

1.5-6 Mandatory Modifications and Inspections: Procedures for Classifications

1.5-7 Master Minimum Equipment Lists

1.5-8 Mandatory Action on Aircraft Operating in accordance with a Permit to Fly
### Section 1.6  Continued Airworthiness — Responsibilities of the Operator

1.6-2  Maintenance of Aircraft
   
   **Appendix No. 1 — Maintenance Programmes: Reliability Centred Maintenance and Condition Monitored Maintenance Programmes**

1.6-4  Weight and Balance of Aircraft
   
   **Appendix No. 1 — Weight and Balance of Aircraft - Fleet Mean Weight and Fleet Mean Centre-of-Gravity**

1.6-5  Minimum Equipment Lists

1.6-6  Mandatory Modifications, Inspections and Changes to Approved Documentation: Procedure for Implementation

1.6-7  Certification of Inspections, Overhauls, Modifications, Repairs, and Replacements

1.6-8  Flight Testing after Modification or Repair

### Section 1.7  Procedures for the Approval of Documents and Manuals for Operation and Maintenance of Aircraft

1.7-2  Flight Manuals

1.7-3  Crew Manuals

1.7-4  Maintenance, Overhaul and Repair Manuals
   
   **Appendix No. 1 — Automatic Test Equipment Software**

1.7-5  Approval of Maintenance Schedules
   
   **Appendix No. 1 — Maintenance Schedule Supplement — Organisation Approval for the Approval of Maintenance Schedule Amendments**

1.7-6  Minimum Equipment Lists

1.7-8  Technical Logs

1.7-9  Modification Record Book

1.7-10 Weight and Balance Report
Appendix No. 1 — Weight and Centre-of-Gravity Schedules for Aircraft Exceeding 2730 kg

Appendix No. 2 — Weight and Centre-of-Gravity and Loading and Distribution Schedules for Aircraft Not Exceeding 2730 kg

Section 1.8 Approvals

1.8-5 Process Companies Group B3

1.8-6 Test Houses Group B4

1.8-9 Organisations — Approval for Flight under 'B' Conditions

Appendix No. 1 — Organisations - Approval for Flight under 'B' Conditions Group F4

Appendix No. 2 — Organisations - Approval for Flight under 'B' Conditions Group G1

Appendix No. 3 — Organisations - Approval for Flight under 'B' Conditions Group F1

Appendix No. 4 — Organisations - Approval for Flight under 'B' Conditions Group F3

1.8-10 Approval of Welders

Appendix No. 1 — Approval of Welders

Appendix No. 2 — Recognition of Test Laboratory Holding CNAS/HKAS/UKAS Accreditation

1.8-11 Procedures for Approval of Organisations Concerned with Radiographic Inspection of Aircraft during Maintenance and Overhaul

Appendix No. 1 — Procedures for Approval of Organisations Concerned with Radiographic Inspection of Aircraft During Maintenance and Overhaul

1.8-12 Procedures for Approval of Organisations Concerned with Ultrasonic Inspection of Aircraft during Maintenance and Overhaul

Appendix No. 1 — Procedures for Approval of Organisations Concerned with Ultrasonic Inspection of Aircraft During Maintenance and Overhaul

1.8-13 Aircraft and Aircraft Component Maintenance Organisations
Appendix No. 1 — Assessment of Suitability for Approval
Appendix No. 2 — Training Programme and Facilities
Appendix No. 3 — Authorisation of Personnel

1.8-14 Approval of Organisations to Recommend Certificate of Airworthiness
Renewal of Aeroplanes & Rotorcraft Above 2730 Kg MTWA

1.8-15 Aeroplanes and Rotorcraft Not Exceeding 2730 KG — Maintenance
Organisations - Group M3

Appendix No. 1 — Assessment of Suitability for Approval
FOREWORD

1 PURPOSE

Hong Kong Aviation Requirements (hereinafter referred to as the 'HKAR') of which HKAR-1 is a constituent part, are published by the Director-General of Civil Aviation (hereinafter referred to as the 'Director-General'). They comprise minimum requirements and constitute the basis for the issue of approvals and certificates required by the current Air Navigation (Hong Kong) Order 1995 (hereinafter referred to as AN(HK)O).

2 GENERAL

2.1 The Chief Executive of Hong Kong Special Administrative Region is the airworthiness authority in Hong Kong Special Administrative Region and has authorised the Director-General of Civil Aviation to exercise his powers in this respect.

Note: For the purpose of this HKAR the following definitions shall apply:-

'Chief Executive' means the Officer for the time being administering the Hong Kong Special Administrative Region Government.

'Director-General' means the Director-General of Civil Aviation who is authorised for the purpose under the Air Navigation (Hong Kong) Order 1995 by the Chief Executive of Hong Kong Special Administrative Region and includes any person who is delegated for that purpose.

2.2 It is the policy of the Chief Executive to exercise his various discretionary powers by reference to certain documents with a view to ensuring effective implementation of International Civil Aviation Organization (ICAO) standards. In order to ensure that all these ICAO standards are reflected in Hong Kong aviation legislation, this ICAO compliance statement to HKAR-1 (CAD 554) is issued.

This HKAR-1 (CAD 554) is published in support of the powers of the Chief Executive contained in Part III of the Air Navigation (Hong Kong) Order 1995.

The document includes international standards contained in Annexes to the Chicago Convention.

It is the policy of the Director-General to have reference to this document when exercising the discretionary powers referred to above and in particular
he will normally exercise those powers so as to ensure effective implementation of any such international standards.

2.3 Compliance with the procedures in HKAR-1 is, normally required. The Director-General may accept proposals to vary the procedures in a particular case, provided such variations give, at least, an equivalent level of safety to that intended by the HKAR.

2.4 HKAR-1 contains Certification and Approval procedures for aircraft and equipment for which Hong Kong Certification or Approval is required. Although the Director-General has responsibilities under the AN(HK)O in relation to the certification, operation and maintenance of aircraft on the Hong Kong Register, certain primary airworthiness responsibilities defined in ICAO Annex 8 are those of the Authority of the State of Design.

2.5 Major aviation products are increasingly those of collaboration between manufacturers of more than one country. Nevertheless it remains important, particularly in the context of continued airworthiness, that the primary responsibility be identified with one Authority. The Procedures of HKAR-1 are intended to cover these circumstances.

2.6 Reflecting the collaborative nature of manufacture, the functions of the National Authorities are often also undertaken jointly or in collaboration. The provisions of Bilateral and Multilateral Agreements and Arrangements between nations on airworthiness matters have been developed more extensively and HKAR-1 takes account of the related procedures at least in principle; the details of these procedures have so far varied significantly according to the particular arrangements within which a project is undertaken.

2.7 **Supply of Material to the Director-General.** Where, in compliance with the HKAR, material (e.g. manuals, documents) is required to be sent to the Director-General, the consignor shall ensure, before despatch, that he has paid, or has arranged to pay, all charges necessary to cover delivery of the material to the CAD Airworthiness Office.

3 **INTERPRETATION**

3.1 The HKAR, with or without explanatory matter, should not be regarded as constituting a text book of current aeronautical knowledge. The interpretation of the HKAR against a background of such knowledge is essential.
3.2 Where necessary the HKAR are supplemented by Appendices. Generally these Appendices take the form of acceptable interpretation of requirements, state recommended practices, or give supplementary information.

3.3 Mandatory clauses are invariably denoted by the use of 'shall' or 'must'; 'should' or 'may' are used in the text to introduce permissive or recommended clauses.

3.4 Imperatives such as 'ensure', 'prevent' and 'shall be designed', imply that the applicant, before claiming compliance with the requirement in question, will take all the steps that are deemed to be necessary in the light of the knowledge and techniques available at the time.

3.5 It is implicit in requirements expressed qualitatively (e.g. 'readily visible', 'adequately tested', etc.) that the Director-General will adjudicate in cases where doubt exists.

4 EDITORIAL PRESENTATION

4.1 The requirements of HKAR-1 are presented in full page width on loose pages, each page being identified by the date of issue or revision under which it is issued or amended.

4.2 HKAR-1 is divided into eight Sections numbered consecutively. The Sections are further divided by subjects into Sub-sections, the numbering of each Sub-section being associated with its Section (e.g. Section 1.2 contains Sub-sections 1.2-1, 1.2-2, etc.).

4.3 A list of the subjects and the numbers of the Sub-sections is given in the CONTENTS.

4.4 A system of progressive paragraph numbering is used, the number of digits being kept to a maximum of three by associating the system with paragraph headings. A paragraph heading applies to all succeeding paragraphs until another titled paragraph with the same, or a smaller number of digits occurs.

4.5 Amendments are incorporated into the print text by means of a 'Revision'.

4.6 New, amended and corrected text is indicated with a marginal line. Correction of typographical mistakes and reformat of paragraphs are however not indicated.
HKAR-1

5 EFFECTIVE DATE

New requirements and amendments promulgated in HKAR-1 are effective from the date printed on them.

6 APPLICATIONS AND ENQUIRIES

Applications for further copies of the HKAR-1, permission to reproduce any part of the HKAR and any enquiries regarding their technical content should be addressed to the Civil Aviation Department, Airworthiness Office, 1 Tung Fai Road, Hong Kong International Airport, Lantau, Hong Kong. This address should be used when requesting forms or when making applications for Certificates of Airworthiness, etc., and any services normally rendered by the Airworthiness Office.
HONG KONG AVIATION REQUIREMENTS

CHECKLIST OF PAGES

AIRWORTHINESS PROCEDURES

The following pages of HKAR-1 are now current:

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Page</td>
<td>29 September 2017</td>
</tr>
<tr>
<td>ii</td>
<td>29 September 2017</td>
</tr>
<tr>
<td>C-1 to C-5</td>
<td>29 September 2017</td>
</tr>
<tr>
<td>F-1 to F-4</td>
<td>10 December 2012</td>
</tr>
<tr>
<td>CL-1 to CL-2</td>
<td>29 September 2017</td>
</tr>
<tr>
<td>P-1 to P-7</td>
<td>29 September 2017</td>
</tr>
<tr>
<td>1.1-2 P.1 to 1.1-2 P.2</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.1-3 P.1 to 1.1-3 P.2</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.2-2 P.1 to 1.2-2 P.7</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.2-2 A1 P.1 to 1.2-2 A1 P.5</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.2-3 P.1 to 1.2-3 P.2</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.2-3 A1 P.1</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.2-4 P.1</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.3-2 P.1 to 1.3-2 P.8</td>
<td>15 August 2011</td>
</tr>
<tr>
<td>1.3-3 P.1 to 1.3-3 P.5</td>
<td>30 November 2010</td>
</tr>
<tr>
<td>1.3-3 A1 P.1</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.3-4 P.1 to 1.3-4 P.10</td>
<td>31 July 2013</td>
</tr>
<tr>
<td>1.3-5 P.1 to 1.3-5 P.9</td>
<td>31 January 2011</td>
</tr>
<tr>
<td>1.3-6 P.1 to 1.3-6 P.3</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.3-8 P.1 to 1.3-8 P.2</td>
<td>31 January 2011</td>
</tr>
<tr>
<td>1.3-9 P.1</td>
<td>29 January 2016</td>
</tr>
<tr>
<td>1.3-11 P.1 to 1.3-11 P.4</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.4-2 P.1 to 1.4-2 P.7</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.4-2 A1 P.1 to 1.4-2 A1 P.3</td>
<td>31 January 2009</td>
</tr>
<tr>
<td>1.4-4 P.1 to 1.4-4 P.4</td>
<td>31 January 2009</td>
</tr>
</tbody>
</table>
This HKAR-1 was issued on 1 July 1996 and became effective on the same date. The preambles are intended to be a summarized record of the main changes introduced by each amendment of HKAR-1.

**Issue 1**
1 July 1996

- New requirements, basis and procedures for the issue of approvals and certificates required by the current Air Navigation (Hong Kong) Order 1995.

**Issue 2**
31 January 2009

- Incorporated contents of Issue 1, Revision 13 which have not been changed.

- Added a new Sub-section 1.1-3 (Non-Compliance Findings).

- Amended Sub-section 1.2-2 paragraph 2 stating that the issue of a Hong Kong Type Certificate is a pre-requisite to the issue of a Certificate of Airworthiness for an aircraft of that type has not previously been issued with a Hong Kong Certificate of Airworthiness in that Category.

- Amended Sub-section 1.2-2 sub-paragraph 4.1.2 that the design shall not have any features or characteristics that render it unsafe under the anticipated operating conditions.

- Amended Sub-section 1.2-2 Appendix No. 1:
  - Included EASA Certification Specifications (CS) and European Technical Standard Orders (ETSO)
  - Superseded the reference of ‘UK Additional Requirements and Special Conditions for the Certification of Foreign Constructed Aircraft (CAP 480)’ with ‘Mandatory Airworthiness Requirements (CAP 747)’ in sub-paragraph 5.1
  - Added new paragraph 9 ‘Environmental Protection Requirements and Certification Specifications’

- Added a new sub-paragraph 4.1.5 to Sub-section 1.2-2 and also amended Sub-section 1.2-5 sub-paragraph 2.1.4 stating design organisation approval holder shall ensure the aircraft is specifically guarded against dangerous features by complying with appropriate airworthiness requirements.

- Changed the titles of Sub-section 1.2-3 and its Appendix No. 1.

- Changed the title of Sub-section 1.2-4.
- Amended Sub-section 1.2-5 sub-paragraphs 1.1 and 1.2 that the design shall not have any features or characteristics that render it unsafe under the anticipated operating conditions; and also revised the definitions of major modification/repair to include reliability, operational characteristics, noise, fuel venting and exhaust emission.

- Amended Sub-section 1.2-5 sub-paragraph 2.1.2 with the criteria for classification and approval of major and minor modifications.

- Amended Sub-section 1.2-5 sub-paragraph 2.1.5 that the applicant shall have sound knowledge of the design principles embodied in the aircraft type being modified or repaired.

- Added a ‘NOTE’ to Sub-section 1.2-5 sub-paragraph 2.1.5 that application for major modification shall be supported by type certificate holder.

- Added a new sub-paragraph 2.1.5(c) to Sub-section 1.2-5 stating the criteria for a new Type Certificate.

- Changed the heading of sub-paragraph 2.3 of Sub-section 1.2-5 Appendix No. 1 and amended sub-paragraphs 2.6 and 2.7 to align with the relevant descriptions in sub-paragraphs 1.1 and 1.2 of Sub-section 1.2-5.

- Added a ‘NOTE’ to Sub-section 1.3-2 sub-paragraph 2.1 that applicant should submit all related substantiation documents and reports to the Director-General at least ten working days prior to the anticipated date of issuing the C of A.

- Added a new paragraph 11 to Sub-section 1.3-2 stating the validity of newly issued Certificate of Airworthiness.

- Added a new paragraph 8 to Sub-section 1.3-4 stating the validity of renewed Certificate of Airworthiness.

- Added new sub-paragraphs 1.2(e) and 2.4 to Sub-section 1.3-7 stating the purposes and application procedures for the issue of a Permit to Fly respectively.

- Changed the title of Sub-section 1.4-2.

- Changed the title of Sub-section 1.4-4.

- Amended Sub-section 1.6-2 sub-paragraphs 1.1 and 2.1 stating approved maintenance schedules are required for aircrafts registered in Hong Kong.

- Added new sub-paragraphs 10.2, 10.3 and 10.4 to Sub-section 1.6-2 stating the requirements and types of maintenance records to be retained.
- Amended Sub-section 1.6-5 sub-paragraphs 1.1 to 1.3 stating the requirements of AN(HK)O 1995 Article 14A and the terms of a permission granted under this Article.

- Amended Sub-section 1.6-5 paragraph 5 with the word “acceptance” renamed as “approval”.

- Amended Sub-section 1.7-5 sub-paragraph 2.1 stating an aircraft registered in Hong Kong in respect of which a certificate of airworthiness is in force shall not fly unless the aircraft (including in particular its engines), together with its equipment and radio station, is maintained in accordance with a maintenance schedule approved by the Director-General in relation to that aircraft.

- Amended Sub-section 1.7-5 Appendix No. 1 sub-paragraphs 1.1 and 1.2 (renumbered as new sub-paragraphs 2.1 and 2.2) providing supplementary information with respect to Maintenance Schedule requirements. In addition, a new paragraph 3 (Human Factors Consideration) is also incorporated.

- Deleted Sub-section 1.8-1.

- Relocated the three appendices of original Sub-section 1.8-1 to Sub-section 1.8-2, with Appendix No. 1 renamed as ‘Exposition Guidance’.

- Amended Sub-section 1.8-2 sub-paragraph 3.11 to establish the requirements for all materials used in those parts of an aircraft which are essential for its operation to conform to approved specifications.

- Changed the reference ‘Sub-section 1.8-1 Appendix No.1’ to ‘Sub-section 1.8-2 Appendix No.1’ in Sub-section 1.8-4 sub-paragraph 3.2 and also Sub-section 1.8-5 sub-paragraph 3.2.

- Added a new sub-paragraph 3.7 to Sub-section 1.8-5 stating the applicant shall demonstrate that the organisation has established and is able to maintain a quality system; and renumbered the original sub-paragraphs 3.7, 3.8 and 3.9 to 3.8, 3.9 and 3.10 respectively. Similarly for Sub-section 1.8-6 and renumbered the original sub-paragraphs 3.7 and 3.8 to 3.8 and 3.9 respectively.

- Added a new sub-paragraph 3.10 to Sub-section 1.8-8 stating that approved E2 organisations shall have a system for collecting, investigating, and analyzing reports of and information related to failures, malfunctions, defects or other occurrences which cause or might cause adverse effects on the continuing airworthiness of the product, part or appliance covered by the modification design approval; and renumbered the original sub-paragraph 3.10 to 3.11.

- Amended Sub-section 1.8-8 sub-paragraph 4.7 stating that with respect to sub-paragraph 3.10, the E2 organisation shall investigate the reason for the deficiency, if any, and report to the Director-General the results of its investigation and any action it is taking or proposes to take to correct that deficiency.
- Deleted description/reference of ‘Sub-section 1.8-1’ from:
  - Sub-section 1.3-8, sub-paragraph 2.4(b)
  - Sub-section 1.6-2, sub-paragraph 9.4.2(a)
  - Sub-section 1.8-2 Appendix No. 1, paragraph 1 (originally as Sub-section 1.8-1 Appendix No.1)
  - Sub-section 1.8-2 Appendix No. 3, paragraph 1 and sub-paragraph 2.3 (originally as Sub-section 1.8-1 Appendix No. 3)

- Deleted all descriptions of ‘E1 approval’ in:
  - Sub-section 1.8-8
  - Sub-section 1.8-8 A1
  - Sub-section 1.8-9

- Deleted Sub-section 1.8-19.

- Deleted ‘as amended’ from the following paragraphs/sub-paragraphs indicating ‘Air Navigation (Hong Kong) Order 1995’ instead of ‘Air Navigation (Hong Kong) Order 1995, as amended’:
  - Foreword, sub-paragraph 2.2
  - Sub-section 1.1-2, sub-paragraphs 2.1.2 and 2.2(f)
  - Sub-section 1.2-2, sub-paragraphs 4.1.1, 4.2.1, 4.3.2, 4.4.1, 4.4.3, 5.1, 5.3, 7.2.2
  - Sub-section 1.2-2 A1, paragraphs 4 and 8
  - Sub-section 1.2-3 A1, paragraph 2
  - Sub-section 1.3-2, paragraph 9
  - Sub-section 1.3-3, sub-paragraph 1.5
  - Sub-section 1.3-3 A1, paragraph 2
  - Sub-section 1.3-4, sub-paragraph 6.1
  - Sub-section 1.3-5, sub-paragraph 1.4
  - Sub-section 1.3-6, sub-paragraphs 1.2, 3.3.1 and 4.1(d)
  - Sub-section 1.3-7, sub-paragraph 1.1
  - Sub-section 1.3-8, sub-paragraphs 1.1 and 1.2
  - Sub-section 1.3-9, sub-paragraphs 1.1 and 1.2
  - Sub-section 1.5-4, paragraph 1
  - Sub-section 1.5-6, sub-paragraph 1.2
  - Sub-section 1.5-7, sub-paragraph 1.1
  - Sub-section 1.6-2, sub-paragraphs 1.1, 6.1(a) & (b), 7.1(b)(ii), 8.2(a) & (b), 8.3, 9.3.8 and 10.1(c)
  - Sub-section 1.6-4, paragraph 1
  - Sub-section 1.6-5, sub-paragraph 1.1
  - Sub-section 1.6-6, sub-paragraph 1.4
  - Sub-section 1.6-7, paragraph 1
  - Sub-section 1.6-8, sub-paragraph 1.4
  - Sub-section 1.7-2, sub-paragraphs 1.1, 2.1.1(b)
  - Sub-section 1.7-5, sub-paragraphs 1.1 and 2.1
  - Sub-section 1.7-8, paragraph 1
HKAR-1

Sub-section 1.7-10, sub-paragraphs 1.2, 2.10 and 3.1.7
Sub-section 1.8-8 A1, sub-paragraph 3(d)
Sub-section 1.8-9, sub-paragraphs 1.1, 3.5.2(b), 3.5.3, 3.9.1, 3.9.2, 3.10.1, 3.10.2 and 4.7
Sub-section 1.8-11, paragraph 1(1)
Sub-section 1.8-12, paragraph 1

Issue 2 Revision 1  
23 February 2009

- Amended Sub-section 1.5-7 sub-paragraph 1.1 to replace the information related to “exemptions” with an introduction of Master Minimum Equipment List.

- Added sub-paragraph 2.2.3 in Sub-section 1.7-2 to require procedures shall be established by the applicant to ensure that the flight manual is updated by incorporating the amendments, including changes classified as mandatory by the Director-General; or in case of an aircraft leased to a Hong Kong operator, classified as mandatory by the State of Registry.

Issue 2 Revision 2  
30 November 2009

- Amended Sub-section 1.8-2 Appendix No. 3 to refer HKAR-2 Chapter 31 for use and instructions for the completion of the Authorised Release Certificate (CAD Form One).

Issue 2 Revision 3  
30 November 2010

- Amend Sub-section 1.3-3 to accept production flight test conducted by Type Design Organisation on subsequent delivery aircraft.

Issue 2 Revision 4  
31 January 2011

- Amend Sub-section 1.2-5 to accept repair designs prepared by the type certificate holder of aircraft or engine and approved by the State of Design.

- Amend Sub-section 1.3-2 to specify the timeline for the submission of CAD Form DCA46D and related substantiated documents when applying for Certificate of Airworthiness. The requirement for the specification of the Maximum Approved Passenger Seating Configuration (MAPSC) in Aircraft Flight Manual or its supplement is also introduced.

- Amend Sub-section 1.3-5 to revise the general requirements on flight testing for the renewal of Certificates of Airworthiness or Permit to Fly.

- Amend Sub-section 1.3-8 to reword the requirements for flights under A Conditions.

- Amend Sub-section 1.3-9 to introduce Flight Test Risk Assessment for flights under B Conditions.

Issue 2 Revision 14  
P-5  
29 September 2017
HKAR-1

- Amend Sub-section 1.6-6 to revise the requirements on mandatory modifications, inspections and changes to approved documentation: procedure for implementation.

- Amend Sub-section 1.8-2 to specify the timeline for the phase-out of Suppliers Group A2.

- Amend Sub-section 1.8-8 to specify the timeline for the phase-out of Group E2 Design Organisation.

Issue 2 Revision 5 15 August 2011

- Delete Sub-section 1.2-5 as the requirement is published in HKAR-21.

- Amend Sub-section 1.3-2 to inform the additional time required for the processing of certificate of airworthiness applications for aircraft equipped with peculiar interior.

Issue 2 Revision 6 1 October 2011

- Amend Sub-section 1.3-4 on documents to be provided for examination when renewing Certificate of Airworthiness.

- Amend Appendix 3 of Sub-section 1.8-13 on minimum requirements for persons authorized to issue Certificates of Maintenance Review.

Issue 2 Revision 7 10 December 2012

- Amend page ii and Forward page on address and telephone number of CAD.

Issue 2 Revision 8 31 July 2013

- Amend Sub-section 1.3-4 to allow coincident annual inspection to take place outside the premises of an organisation approved for the purpose.

- Some editorial changes are included.

Issue 2 Revision 9 30 January 2014

- Amend Sub-section 1.8-13 Appendix 3 to update requirements for the authorization of personnel.

Issue 2 Revision 10 27 February 2015

- Amend Sub-section 1.8-10 to update requirements for approval of welders.
Add Sub-section 1.8-10 Appendix 2 to recognize test laboratory holding certain accreditations.

**Issue 2 Revision 11**  
29 January 2016

- Amend Sub-section 1.3-9 to update the FAA referencing document for Flight Test Risk Assessment (FTRA).

- The page number on all the ‘Internationally Left Blank’ pages are removed and the ‘Checklist of Pages’ are updated accordingly.

**Issue 2 Revision 12**  
31 August 2016

- Amended Sub-section 1.5-2 to include the ‘Maintenance Type Board’ and update the procedures

- Deleted Sub-section 1.8-2. Manufacture, test, inspection and certification of aeronautical components, assemblies and items of equipment are covered in HKAR-21. (also refer to Airworthiness Notice No. 18 Issue 3 for phase-out of respective HKAR-1 requirement)

- Deleted Sub-section 1.8-3. Approval of organisations to amend maintenance, overhaul and repair manuals is covered in HKAR-21. (also refer to Airworthiness Notice No. 18 Issue 3 for phase-out of respective HKAR-1 requirement)

- Deleted Sub-section 1.8-4. Manufacture, test, inspection and certification of aeronautical materials are covered in HKAR-21. (also refer to Airworthiness Notice No. 18 Issue 3 for phase-out of respective HKAR-1 requirement)

- Deleted Sub-section 1.8-8. E2 and E3 certification activities are covered in HKAR-21. (also refer to Airworthiness Notice No. 18 Issue 3 for phase-out of respective HKAR-1 requirement)

**Issue 2 Revision 13**  
28 February 2017

- Deleted Sub-section 1.3-7 and its Appendices titled ‘Issue and Renewal of Permits to Fly’. Guidance is covered in Airworthiness Notice No. 110 and its Appendix 1.

**Issue 2 Revision 14**  
29 September 2017

- Amended Sub-section 1.6-6 to define product and equipment; to simplify the CAD policy on adoption of non-Hong Kong airworthiness directives; to add owners/operators’ responsibility to monitor airworthiness directives and emergency directives; to add ‘risk assessment analysis’ as part of required data to support AMOC application; and to allow delegation to DOA for approval of equipment serial number specific AMOC.
Section 1.1

General
SECTION 1.1

SUB-SECTION 1.1-2

CATEGORIES OF AIRCRAFT

1 INTRODUCTION

The Certificate of Airworthiness or Permit to Fly imposes conditions affecting the manner in which an aircraft may be maintained and operated, and the purposes for which it may be used. The conditions are imposed in the following manner:

(a) By placing an aircraft in Categories which indicate the uses for which the aircraft is approved.

(b) By indicating either in the Certificate of Airworthiness or Permit to Fly or in their associated documents the detailed limitations which must be observed.

2 CATEGORIES AND PURPOSES

2.1 The categories in which an aircraft may be placed are as follows:

2.1.1 Certificates of Airworthiness

(a) Transport Category (Passenger).

(b) Transport Category (Cargo).

(c) Aerial Work Category.

(d) Private Category.

(e) Special Category.

2.1.2 Permit to Fly

NOTE: A Permit to Fly may be issued in respect of an aircraft, in accordance with Article 7(1)(e) of the Air Navigation (Hong Kong) Order 1995. The Director-General will not normally issue a Permit to Fly if it appears to the Director-General that the aircraft is eligible and ought to fly under and in accordance with a Certificate of Airworthiness.
The purposes for which the aircraft may fly are as follows:

(a) **Transport Category (Passenger):** Any purpose.

(b) **Transport Category (Cargo):** Any purpose, other than the public transport of passengers.

(c) **Aerial Work Category:** Any purpose, other than public transport.

(d) **Private Category:** Any purpose, other than public transport or aerial work.

(e) **Special Category:** Any purpose, other than public transport specified in the Certificate of Airworthiness but not including the carriage of passengers unless expressly permitted.

(f) **Permit to Fly:** Any purpose, other than public transport or unless expressly permitted aerial work, specified on the Permit to Fly.

**NOTE:** The Air Navigation (Hong Kong) Order 1995 Article 7(1)(e) restricts an aircraft in the respect of which a Permit to Fly has been issued to flights beginning and ending in Hong Kong. The Director-General may consider granting an exemption under Article 95 from this part of the Order.

Flights over or into another country by an aircraft in respect of which either a Special Category Certificate of Airworthiness or a Permit to Fly has been issued and, in the case of a Permit to Fly, an exemption has been granted, will normally require the permission of the Authority of that country.
SECTION 1.1

SUB-SECTION 1.1-3

NON-COMPLIANCE FINDINGS

1 INTRODUCTION

1.1 There will be occasions when the Director-General carrying out an audit of an organisation for compliance with HKAR-1 will find evidence of non-compliance.

1.2 "Findings" are categorised into 2 groups as described in paragraph 2.

1.3 After receipt of notification of findings, the HKAR-1 approval(s) holder should define a corrective action plan and demonstrate corrective action to the satisfaction of the Director-General within a period agreed with the Director-General. Details refer to paragraph 3.

2 CATEGORIES OF FINDINGS

2.1 When objective evidence is found showing non-compliance with the applicable requirements of HKAR-1, the finding shall be classified as follows:

(a) A “Level 1 finding” is any non-compliance with HKAR-1 which could lead to uncontrolled non-compliances with applicable airworthiness requirements and could affect the safety of the aircraft.

(b) A “Level 2 finding” is any non-compliance with HKAR-1 which is not classified as level one.

2.2 An ‘Observation’ is any item where it has been identified, by objective evidence, to contain potential problems that could lead to non-compliance under paragraph 2.1.

3 RECTIFICATION OF FINDINGS

3.1 After receipt of notification of findings/observations:

(a) In case of a Level 1 finding, the HKAR-1 approval(s) holder shall demonstrate corrective action to the satisfaction of the Director-General within a period of no more than twenty-one working days after written
confirmation of the finding.

(b) In case of Level 2 findings, the corrective action period granted by the Director-General shall be appropriate to the nature of the finding but in any case initially shall not be more than six months. In certain circumstances and subject to the nature of the finding the Director-General may extend the six month period subject to a satisfactory corrective action plan agreed by the Director-General.

(c) An Observation shall not require immediate action by the HKAR-1 approval(s) holder.

3.2 In case of Level 1 or Level 2 findings, the HKAR-1 approval(s) may be subject to a partial or full limitation, suspension or revocation. The HKAR-1 approval(s) holder shall provide confirmation of receipt of the notice of limitation, suspension or revocation of the HKAR-1 approval(s) in a timely manner.
Section 1.2

Approval of the Type Design
SECTION 1.2

SUB-SECTION 1.2-2

TYPE CERTIFICATION

1 INTRODUCTION

1.1 A Type Certificate issued by the Director-General constitutes a statement that the design of the aircraft type to which the Type Certificate refers and of the variants specified on the Type Certificate Data Sheet has been approved by the Director-General.

1.2 Applicants for the Hong Kong Certification of an aircraft should be aware that, in accordance with the requirements of HKAR-1, all such aircraft, irrespective of their size, will normally be subject to investigation by the Director-General in order to establish, taking into account their design, construction, modification standards and original certification basis, that a level of airworthiness equivalent to that provided by Hong Kong airworthiness standards has been met. However, in order to achieve this, the principles of granting Hong Kong Type Certification by accepting the certification approval granted by the Authority of the State of Design, will be used as far as possible. The degree by which the certification of the Authority of the State of Design can be taken account of, and the amount of additional investigation required, will depend on various criteria as covered in paragraphs 4.1, 4.2 and 4.3. The Director-General will also require knowledge of the arrangements for post-certification design support in order to be satisfied that this airworthiness standard may be expected to be sustained after certification.

1.3 When a Hong Kong Type Certification has been granted, all aircraft of a type which conform to the defined standard would qualify for a Certificate of Airworthiness, provided the condition of the aircraft concerned was acceptable to the Director-General.

2 SCOPE OF APPLICATION OF THE TYPE CERTIFICATE

The issue of a Hong Kong Type Certificate is a pre-requisite to the issue of a Certificate of Airworthiness for an aircraft of that type has not previously been issued with a Hong Kong Certificate of Airworthiness in that Category.

3 INITIAL PROCEDURE FOR OBTAINING THE TYPE CERTIFICATE

The application for the issue of a Certificate of Airworthiness on CAD Form
DCA46D (see HKAR-1 Sub-section 1.3-2) will also serve as an application for a Type Certificate. No separate application will be needed. Application should be made sufficiently in advance of the required certification date to allow time for the investigation (including approval of the Flight Manual, see paragraph 4.4) to be completed. The charges are prescribed in the Hong Kong Air Navigation (Fees) Regulations.

4 TYPES FOR WHICH A HONG KONG TYPE CERTIFICATE OR CERTIFICATE OF AIRWORTHINESS HAS NOT PREVIOUSLY BEEN ISSUED

4.1 Design Investigation - General

4.1.1 The investigation will be directed primarily to areas where the airworthiness standards as applied by the original certificating Authority may not in the view of the Director-General, be equivalent to the Hong Kong airworthiness standards as reflected in the Appendix No. 1 to this Sub-section. Compliance with the requirements of Air Navigation (Hong Kong) Order 1995 and Hong Kong Airworthiness Notices, in respect of mandatory equipment and operating performance will also be investigated.

4.1.2 The extent and depth of the design investigation will vary according to the design features of the aircraft, including in particular the type of powerplant. (see paragraphs 4.2 and 4.3). The design shall not have any features or characteristics that render it unsafe under the anticipated operating conditions.

4.1.3 As a result of his design investigation, the Director-General may prescribe Additional Requirements or Special Conditions, and the certificating Authority of the State of Design may be asked to certify that compliance with such Additional Requirements or Special Conditions has been established.

NOTE: (1) Special Conditions may be specified when Director-General finds that the airworthiness regulations do not contain adequate or appropriate safety standards for an aircraft, aircraft engine or component, because of novel or unusual design features.

(2) Additional Requirements are those additional design requirements considered necessary by the Director-General in addition to the requirements of the certificating Authority of the State of Design to provide a level of safety and environment quality (including noise) equivalent to what is provided by the Hong Kong certification basis. When any of the Additional Requirements cannot be satisfied, a statement from the Director-General indicating that he will accept the deviation must be obtained.
4.1.4 For those aircraft types certificated by the United Kingdom Civil Aviation Authority (UKCAA), the Joint Aviation Authorities (JAA), European Aviation Safety Agency (EASA) or Federal Aviation Administration (FAA), the Director-General accepts that they are in compliance with the basic requirements of the Hong Kong airworthiness standards. No Additional Requirements or Special Conditions will be imposed.

4.1.5 The type certificate holder shall ensure the aircraft is specifically guarded against dangerous features by complying with appropriate airworthiness requirements. If the aircraft is known or suspected not to comply with the requirements, the type certificate may be withheld by the Director-General.

4.1.6 The associated procedures for certificating engine and propeller types are contained in HKAR-1 Sub-sections 1.4-2 and 1.4-4.

4.2 Design Investigation - Piston-engined Aircraft

4.2.1 Conventional piston-engined aeroplanes and rotorcraft the MTWA of which does not exceed 2730 kg in any Certificate of Airworthiness Category and conventional piston-engined aeroplanes not exceeding 5700 kg in the Private Category or Aerial Work Category, which have been designed, constructed and certificated, and are likely to be supported, to airworthiness standards which the Director-General accepts as being broadly equivalent to Hong Kong standards, will normally be investigated only in respect of appropriate Hong Kong Airworthiness Notices, of Civil Aviation (Aircraft Noise) Ordinance as amended, and of Air Navigation (Hong Kong) Order 1995 for Transport Category certification. The engines and propellers of such aircraft types will be dealt with in the same way.

4.2.2 Aircraft as specified in paragraph 4.2.1 but having unconventional design features or which are pressurised, or are intended for aerobatics may be the subject of more detailed investigation, particularly in respect of matters related to these features.

4.2.3 For piston-engined aircraft not specified in paragraph 4.2.1 or 4.2.2 the general principles of paragraph 4.1 will be applied.

4.3 Design Investigation - Turbine-engined Aircraft

4.3.1 Turbine-engined aircraft in any certification category except for those specified in paragraph 4.3.2, will be subjected to investigation in depth
in accordance with the principles of paragraph 4.1.

4.3.2 For single turbine-engined aircraft, the MTWA of which does not exceed 2730 kg, the principles of paragraph 4.1 will be applied. However, in considering the depth of the investigation (paragraph 4.1.2 above), those features of the design which are simple, conventional and similar to previously certificated types will not normally need to be investigated. However, the type will be investigated in respect of appropriate Hong Kong Airworthiness Notices, of Civil Aviation (Aircraft Noise) Ordinance as amended, and the Air Navigation (Hong Kong) Order 1995 for Transport Category certification.

4.4 Performance and Flight Manual

4.4.1 Normal Design Investigation

For aircraft (aeroplanes and rotorcraft) investigated in accordance with paragraph 4.1, a Flight Manual must be provided which contains the limitations, procedures and performance information in accordance with the Hong Kong aviation requirements applicable to the type of aircraft being investigated. This Flight Manual will normally be produced by the manufacturer and the Authority of the State of Design will normally be asked to approve the Flight Manual and constitute the basis of the issue of Hong Kong approval as required by the Air Navigation (Hong Kong) Order 1995.

4.4.2 Piston-engined Light Aircraft (Aeroplanes and Rotorcraft) in the Private and Aerial Work Categories

For aircraft as specified in paragraph 4.2.1 (except for those required to be certificated in the Transport Category) the Flight Manual or Pilot's Operating Handbook, as appropriate, (including all relevant supplements) which has been approved by the Authority of the State of Design for use on that aircraft, will be accepted by the Director-General without investigation.

4.4.3 Piston-engined Light Aircraft (Aeroplanes and Rotorcraft) in the Transport Category

For aircraft as specified in paragraph 4.2.1 which are required to be certificated in the Transport Category, adequate information must be provided in the Flight Manual or Pilot's Operating Handbook, as appropriate, to satisfy the Air Navigation (Hong Kong) Order 1995. In particular, performance information shall be scheduled to satisfy the
applicable performance operating rules. All other aspects of the Flight Manual, or Pilot's Operating Handbook, as appropriate, (including all relevant supplements), will be dealt with as in paragraph 4.4.2.

4.4.4 In all cases one copy of the Flight Manual or Pilot's Operating Handbook, as appropriate, is required to be submitted in English in accordance with HKAR-1 Sub-section 1.7-2.

4.5 **Flight Testing** (See also HKAR-1 Sub-section 1.2-3)

Regardless of the extent of the design investigation, an aircraft of the same design standard as that submitted for certification shall be placed at the disposal of the Director-General.

4.6 **Post-Certification Design Support by Manufacturer and Certification Authority**

Unless the Director-General is already aware of them, confirmation will be required of the arrangements made by the manufacturer and the Authority of the State of Design for providing the necessary continuing airworthiness support after certification.

5 **CHANGE OF CATEGORY**

5.1 Aircraft types investigated in accordance with paragraph 4.1 will be eligible for certification in any Certificate of Airworthiness Category (Private, Aerial Work or Transport). In changing from Private to Aerial Work or Transport Category, modifications or additional equipment installations may be necessary to satisfy Hong Kong Airworthiness Notices or Air Navigation (Hong Kong) Order 1995. It is normal that the investigations carried out in accordance with paragraph 4.1 will have identified such changes.

5.2 Where a piston-engined aeroplane the MTWA of which is between 2730 kg and 5700 kg has been certificated in the Private or Aerial Work Category (in accordance with paragraph 4.2.1) and application is subsequently made for certification in the Transport Category, a design investigation (as in paragraph 4.1), flight testing and Flight Manual review will normally be necessary, as a result of which the Director-General may prescribe Additional Requirements or Special Conditions with which the Authority of the State of Design may be asked to establish compliance.

5.3 In the case of piston-engined aircraft below 2730 kg MTWA certificated in the Private or Aerial Work Category, the additional design investigation necessary for certification in the Transport Category will be limited to differences arising
out of the Hong Kong Airworthiness Notices and Air Navigation (Hong Kong) Order 1995.

6 SERIES AIRCRAFT

Where an aircraft type has already been certificated in Hong Kong, Series aircraft may normally be accepted without further technical investigation. However, for an aircraft to be accepted as a Series aircraft, it is essential that it and its equipment, build standard, and means of compliance with any specified Hong Kong Special Conditions or Additional Requirements, should be demonstrated as being substantially similar to another aircraft of the type or variant thereof accepted for Hong Kong certification; significant differences must be identified and may necessitate further investigation (see paragraph 7 below).

7 DERIVATIVE AND MODIFICATIONS

7.1 New Models and Derivatives

Whenever new models or derivatives of a type previously accepted by the Director-General are submitted for certification, the need for any design investigation or Flight Manual review will follow the criteria and procedures in paragraphs 4 and 5 above.

7.2 Modifications

7.2.1 Any modification (including Supplemental Type Certificates (STC)) incorporated on an aircraft of a type other than those investigated in accordance with paragraph 4.2.1, 4.2.2 or 4.3.2 and which has been approved by an Authority other than the Director-General, may be subject to investigation by the Director-General in accordance with paragraph 4.1.

7.2.2 Any modification (including STCs) incorporated on an aircraft of a type investigated in accordance with paragraph 4.2.1, which has been approved by an Authority which the Director-General accepts as having airworthiness standards broadly equivalent to those of Hong Kong, will also be accepted without design investigation. Where such a modification is incorporated on an aircraft certificated in the Transport Category and is likely to be affected by the requirements of Air Navigation (Hong Kong) Order 1995, the aircraft may be subject to an inspection and the Flight Manual will be subject to review in accordance with paragraph 4.4.3 above.

7.2.3 Any modification (including STCs) incorporated on an aircraft of a type investigated in accordance with either paragraph 4.2.2 or 4.3.2...
will be considered against the criteria of paragraph 4.2.2 or 4.3.2 to determine whether or not an investigation needs to be undertaken.

7.2.4 If a modification, which is subject to an investigation as determined above, could affect the flying qualities, performance, crew procedures or flight deck layout, then flight testing in accordance with paragraph 4.5 above may be undertaken.

8 DOCUMENTS AND MANUALS

Irrespective of the depth of investigation required by this Sub-section, before an aircraft can be accepted for Hong Kong certification, all documents associated with the aircraft must be provided in English. This includes, all documents necessary for the design investigation and those for certification, operation and continued airworthiness of the aircraft.

9 THE TYPE CERTIFICATE AND TYPE CERTIFICATE DATA SHEET

9.1 In most cases (see paragraph 2 above), with the co-operation of the applicant, the Director-General will prepare and issue the Type Certificate together with the associated Type Certificate Data Sheet.

The Type Certificate will contain the following information:

(a) The Type Certificate number.

(b) The designation of the type.

(c) The Aircraft Manufacturer/Constructor (Type Certificate Holder).

(d) A statement that the type of aircraft concerned is acceptable for Hong Kong airworthiness certification.

(e) A reference to the associated Type Certificate Data Sheet.

9.2 The Type Certificate Data Sheet associated with the Type Certificate will give the basis of certification and the designation of each aircraft variant certificated, and also defines some general particulars of the design.

9.3 The Type Certificate and Type Certificate Data Sheet will be issued to the applicant.

9.4 Copies of Type Certificates and Type Certificate Data Sheets may be obtained from the Director-General.
APPENDIX NO. 1 TO SUB-SECTION 1.2-2
HONG KONG AIRWORTHINESS STANDARDS
FOR TYPE CERTIFICATION OF AN AIRCRAFT

1 PURPOSE

The purpose of this Appendix is to record policy and provide guidance to person(s) applying for the issue of the Type Certificate as required by HKAR-1 Sub-section 1.2-2.

2 BASIC REQUIREMENT

Certification Specifications (CS), British Civil Airworthiness Requirements (BCAR), Joint Aviation Requirements (JAR) and Federal Aviation Requirements (FAR) are published by the European Aviation Safety Agency (EASA), the United Kingdom Civil Aviation Authority (UKCAA), the European Joint Aviation Authorities (JAA) and United States Federal Aviation Administration (FAA) respectively. Their status is that they are recognised by the Director-General as an acceptable basis for showing compliance with Hong Kong airworthiness codes.

3 AIRWORTHINESS SPECIFICATIONS

In addition to certain general Industry Specifications dealing with aeronautical products (e.g. BSI Specifications), the Director-General adopts the EASA Certification Specifications for European Technical Standard Orders (ETSO), UKCAA Airworthiness Specifications, JAA Joint Technical Standard Order (JTSO) specifications and FAA Technical Standard Orders (TSO) specifications.

4 AIRCRAFT RADIO EQUIPMENT

Aircraft Radio Equipment (CAP 208) is published by UKCAA. Volume 1 of CAP 208 contains minimum performance requirements designed to ensure that aircraft equipment certificated to them will be compatible with the relevant ICAO Standards. It is now considered to be obsolete in that it no longer represents the minimum performance requirements that UKCAA applies to radio equipment approvals. The document has historical value as the basis of approval of radio equipment which is still approved. Volume 2 of CAP 208 lists all radio equipment approved by the UKCAA for use in the UK registered civil aircraft and indicates, where appropriate, the purposes for which it may be used. It is now considered to be obsolescent in that it no longer represents a complete and definite record of aircraft radio equipment approved by the UKCAA which may currently be used in aircraft radio installation. The document has historical value as the record of radio equipment which has been approved. Information on UKCAA aircraft radio equipment approvals is available
on the UKCAA website.

For the minimum performance requirements to be applied to radio equipment reference should be made to ETSO, JTSO and TSO which outlines the relevant EUROCAE or RTCA minimum operational performance standards for the different types of equipment. The status of ETSO, JTSO and TSO is that they are recognised by the Director-General as acceptable bases for showing compliance with the Hong Kong airworthiness standards and constitute the basis of the issue of approvals as required by the Air Navigation (Hong Kong) Order 1995. The requirements and procedures prescribed in Sub-section 1.4-10 are applicable to radio apparatus which does not hold an EASA ETSO authorization, an UKCAA approval, a JAA JTSO authorisation or a FAA TSO authorisation.

5 ADDITIONAL REQUIREMENTS OR SPECIAL CONDITIONS

Note: This paragraph applies to an aircraft type certificated in Hong Kong but based upon a certification code other than the UKCAA airworthiness standards, FAR, JAR or CS.

5.1 Mandatory Airworthiness Requirements (CAP 747) contains the Additional Requirements for Certification (Special Conditions), specified by UKCAA following design investigation of non UK constructed aircraft types, which must be satisfied before UK certification is granted. The Director-General adopts this publication as Hong Kong Additional Requirements and Special Conditions for the Certification of aircraft types.

5.2 At any time, if there are good reasons for so doing, the Additional Requirements or Special Conditions for a given aircraft type may be subject to review. In particular, for large aeroplanes (i.e. above 5700 kg MTWA), when the criteria described in paragraphs 5.3 to 5.6 are satisfied, the above requirements will be reviewed in whole or in part as discussed below.

5.3 (a) For an aircraft type with a service record which is clearly satisfactory, i.e. a record which is consistent with 95% confidence with a fatal accident rate:

   (i) for airworthiness accidents (having regard to the extent that airworthiness was a causal factor), not exceeding one per ten million hours,

   (ii) from all causes, not exceeding one per million hours,

   the Director-General will consider removing all Hong Kong airworthiness Additional Requirements or Special Conditions.

   NOTE: To satisfy (i), a minimum of thirty million hours of service is required; paragraph 5.4 also applies.
(b) For an aircraft with a limited shortfall in terms of its airworthiness record, it may be considered adequate overall if its fatal accident rate from all causes meets the criterion in paragraph 5.3(a)(ii) with a margin which covers the airworthiness deficiency. For such an aircraft, the Director-General will consider removing all Hong Kong airworthiness Additional Requirements or Special Conditions subject to:

(i) a review of the accident record (fatal and non-fatal accidents) to see if this lends support to particular Additional Requirements or Special Conditions;

(ii) the considerations in paragraph 5.4.

5.4 In considering the removal of all airworthiness Additional Requirements or Special Conditions, the Director-General will take account of:

(a) the relevance of the service experience,

(b) the operating environment,

(c) any remedial actions taken since type certification,

(d) potentially catastrophic and relevant experience on other types.

The Director-General will also be cautious of introducing hazards due to lack of fleet commonality - notably in respect of handling, flight deck layout, instrumentation, flight management systems and warnings.

5.5 For an aircraft which has accumulated of the order of ten million hours in service, manufacturers and operators may, if they wish, examine the service record as it relates to the published airworthiness Additional Requirements or Special Conditions. If this provides reliability or other data of a kind which was unavailable at the time of Hong Kong certification of the type, the type design organisation or other organisation with a suitable design approval may consider if this sheds new light on the state of compliance of unmodified aircraft. If it does, and the airworthiness Additional Requirements or Special Conditions can be satisfied by unmodified aircraft, or by aircraft modified in a new way, the appropriate case may be put to the Director-General.

5.6 More generally, the Director-General will, where possible, take the initiative for reviewing periodically against current requirements those airworthiness Additional Requirements or Special Conditions which apply to aircraft types. If this indicates that any airworthiness Additional Requirements or Special
Conditions should be varied or deleted, the manufacturer and the affected operators will be notified in order that new evidence can be submitted, or the import standard relaxed, as the case may be.

5.7 Any enquiries regarding the technical content of the Additional Requirements and Special Conditions should be addressed to the Civil Aviation Department, Airworthiness Office.

6 AIRWORTHINESS NOTICES (CAD 455)

Airworthiness Notices are issued by the Director-General to circulate information to all concerned with the airworthiness of civil aircraft.

7 CIVIL AIRCRAFT AIRWORTHINESS INFORMATION AND PROCEDURES (CAAIP CAP 562)

Civil Aircraft Airworthiness Information and Procedures are published by the UKCAA providing information on a variety of matters concerned with civil aircraft during manufacture, overhaul, repair and maintenance.

The information is essentially of a general nature which does not include details on specific types of aircraft and engines, specialised equipment and component parts fitted to civil aircraft. Manuals, published by the appropriate constructors and manufacturers, should be consulted for detailed information.

The Director-General recognises this publication as the acceptable practices for showing compliance with the airworthiness standards.

8 AIR NAVIGATION (HONG KONG) ORDER 1995

Prior to the issuance of a Certificate of Airworthiness, an aircraft must comply with the requirements of the Air Navigation (Hong Kong) Order 1995 in respect of equipment to be carried and aircraft markings.

9 ENVIRONMENTAL PROTECTION REQUIREMENTS AND CERTIFICATION SPECIFICATIONS

The Director-General adopts the environmental protection requirements published in Annex 16 to the Chicago Convention as the basis for the issue of a type certificate:

9.1 The applicable noise requirements are prescribed in Volume I of Annex 16 and:

(a) for subsonic jet aeroplanes, in Volume I, Part II, Chapters 2, 3 and 4, as applicable;
9.2 The applicable emission requirements are prescribed in Volume II of Annex 16 and:

(a) for prevention of intentional fuel venting, in Volume II, Part II, Chapter 2;

(b) for emissions of turbo-jet and turbofan engines intended for propulsion only at subsonic speeds, in Volume II, Part III, Chapter 2; and

(c) for emissions of turbo-jet and turbofan engines intended for propulsion only at supersonic speeds, in Volume II, Part III, Chapter 3.
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SECTION 1.2

SUB-SECTION 1.2-3

FLIGHT TESTING FOR TYPE CERTIFICATION OR VALIDATION/ACCEPTANCE

1 GENERAL

1.1 The flight testing of Prototype aircraft under investigation for Type Certification or Validation/Acceptance shall comply with the procedures set out in this Sub-section 1.2-3, as follows:

NOTE: Owners are required to arrange adequate insurance to cover damage to the aircraft and to third parties.

1.2 In order that the Director-General may accept reports on flight test matters, the qualifications and experience of personnel involved in flight testing under the provisions of this Sub-section shall be acceptable to the Director-General. The pilots or flight crew shall be appropriately licensed for the particular type of aircraft concerned and competent to conduct the test laid down in the Airworthiness Flight Test Schedule.

1.3 Except where the Director-General requires additional pilots or flight crew to be carried out for a particular Airworthiness Flight Test, the number of persons conducting the test should be confined to the crew specified in the Certificate of Airworthiness (flight manual).

1.4 Flight test personnel shall be provided with adequate facilities and equipment for the effective performance of their duties.

2 PROTOTYPE AIRCRAFT

The requirements and procedures of this paragraph 2 are applicable where application is made for the issue of a Hong Kong Certificate of Airworthiness or a Permit to Fly in respect of an aircraft type for which a Hong Kong Type Certificate, Certificate of Airworthiness, Type Approval or Permit to Fly, as appropriate (Sub-section 1.2-2 or 1.3-7 as appropriate), has not previously been issued.

2.1 Compliance shall be shown with (a) and (b):

(a) Flight tests shall have been completed, under the jurisdiction of the Responsible Authority of the State of Design of the aircraft (hereinafter referred to as the Responsible Authority) to show
compliance with the relevant airworthiness requirements and Special Conditions of the State of Design.

(b) Except where otherwise agreed, flight tests shall have been completed, either under the jurisdiction of the Responsible Authority or under the supervision of an organisation approved by the Director-General, to show compliance with such Hong Kong Additional Requirements as may have been prescribed provisionally as conditions of Hong Kong certification (see Appendix No.1 to this Sub-section).

2.2 Full details of the results of the flight tests prescribed in paragraph 2.1 shall be made available, together with any additional information required by the Director-General, in order to complete an assessment of the data and to conduct the work as prescribed in paragraph 2.3.

2.3 An aircraft of the same design standard as that submitted for certification shall be placed at the disposal of the Director-General, in order that the Director-General may:-

(a) Carry out any flight tests considered necessary to confirm compliance with such Hong Kong Additional Requirements as may have been prescribed provisionally as conditions of Hong Kong certification, and to establish any further Additional Requirements which may need to be prescribed.

(b) Become familiar with the aircraft type.

(c) Gain information for use in preparing Airworthiness Flight Test Schedules (see Sub-section 1.3-3).

2.4 Except where otherwise agreed, flight tests shall be completed, either under the jurisdiction of the Responsible Authority or under the supervision of an organisation approved by the Director-General, to show compliance with such further Hong Kong Additional Requirements as are prescribed in accordance with paragraph 2.3(a) (see Appendix No. 1 to this Sub-section).

2.5 If at the time of Hong Kong certification, little or no operational experience has been gained on the type, the Director-General will decide what, if any, flying representative of operational use will be required before certification.

2.6 In certain circumstances, it may be necessary for some of the flight tests of paragraph 2.3 to be carried out in Hong Kong or elsewhere, in which case the applicant will be notified and it may be a requirement that the tests be conducted by a person or organisation acceptable to the Director-General.
APPENDIX NO. 1 TO SUB-SECTION 1.2-3

FLIGHT TEST SCHEDULE FOR TYPE CERTIFICATION OR VALIDATION/ACCEPTANCE

1 PURPOSE

The purpose of this Appendix is to record policy and provide guidance to person(s) involved in flight testing for Type Certification or Validation/Acceptance.

2 FLIGHT TEST SCHEDULE

UKCAA Airworthiness Flight Test Schedules are published by the United Kingdom Civil Aviation Authority. Their status is that they are recognised by the Director-General as an acceptable basis for showing compliance with the flight test requirement as required by the Air Navigation (Hong Kong) Order 1995. The requirements and procedures prescribed in Sub-section 1.2-3 are applicable to those aircraft which the UKCAA Airworthiness Flight Test Schedules do not address.
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SECTION 1.2

SUB-SECTION 1.2-4

TYPE CERTIFICATION OR VALIDATION/ACCEPTANCE OF A VARIANT

1 INTRODUCTION

1.1 A Variant is an aircraft which embodies certain design features, dissimilar to the Prototype aircraft, which are required to be investigated for certification purposes.

1.2 The issue of a Certificate of Airworthiness to a Variant will be subject to compliance with the procedures outlined in this Sub-section 1.2-4.

1.3 In the case of a Variant to be investigated for the issue of a Certificate of Airworthiness in the Special Category, the Director-General may accept proposals which would vary the procedures in this Sub-section 1.2-4.

1.4 Before the issue of a Certificate of Airworthiness in the Transport, Aerial Work, or Private Category (see Sub-section 1.1-2 for 'Categories') type aircraft must qualify for a Hong Kong Type Certificate. The procedures for type certification are given in Sub-section 1.2-2 and those for the issue of a Certificate of Airworthiness in Sub-section 1.3-2.

NOTE: A Type Certificate is not normally required for an aircraft to be certificated in the Special Category.

2 APPLICATION

2.1 CAD Form DCA46D, copies of which may be obtained from the CAD Airworthiness Office, shall be completed at an early stage of the design of the aircraft, and returned to the same address.

2.2 The charges are prescribed in the Hong Kong Air Navigation (Fees) Regulations, as amended.

2.3 During the investigation, if it is necessary for an Officer to travel outside Hong Kong, the Director-General will require the applicant to meet the additional costs involved.
Section 1.3

Certificates of Airworthiness and other Provisions for Legal Flight
SECTION 1.3

SUB-SECTION 1.3-2

ISSUE OF CERTIFICATES OF AIRWORTHINESS

1 INTRODUCTION

1.1 A Prototype aircraft is an aircraft which is the first of the type to be investigated for the issue of a Hong Kong Certificate of Airworthiness.

1.2 A Variant aircraft is the first aircraft on the Hong Kong register to embody changes to the type designation which requires an amendment to the information in the Type Certificate Data Sheet.

1.3 A Series aircraft is an aircraft, including engines and equipment, the design of which is similar in every essential respect to the design of an aircraft for which a Hong Kong Certificate of Airworthiness has previously been issued.

1.4 The issue of a Certificate of Airworthiness is dependent on the aircraft being registered in Hong Kong and will be subject to compliance with the procedures outlined in this Sub-section 1.3-2.

1.5 In the case of aircraft to be investigated for the issue of a Certificate of Airworthiness in the Special Category, the Director-General may accept proposals which would vary the procedures in this Sub-section 1.3-2.

1.6 Before the issue of a Certificate of Airworthiness, aircraft must qualify for a Hong Kong Type Certificate. The procedures for type certification are given in HKAR-1 Sub-section 1.2-2.

2 APPLICATION

2.1 CAD Form DCA46D, copies of which may be obtained from the CAD Airworthiness Office, shall be completed at an early stage and returned to the same address. The applicant shall submit the completed form at least 3 months, 6 months and 12 months prior to the anticipated date of issuing the C of A for a new Series, Variant and Prototype aircraft respectively. Additional 3 months shall be allowed for an application for used aircraft.

NOTE: Additional 3 months shall be allowed for aircraft equipped with peculiar interior, such as VIP interior for business jets or major changes in cabin layout in
HKAR-1

jetliners.

2.2 The applicant shall submit all related substantiation documents and reports at least ten working days prior to the anticipated date of issuing the C of A.

2.3 The applicant shall pay deposit for charges prescribed in the Hong Kong Air Navigation (Fees) Regulations at time of application.

2.4 During the investigation, if it is necessary for an Officer to travel outside Hong Kong, the Director-General will require the applicant to meet the additional costs involved.

3 FOR NEW AIRCRAFT

3.1 The applicant shall send to the Director-General:

(a) The Certificate of Airworthiness or Export Certificate of Airworthiness issued by the State of Manufacture, within a period of 60 days immediately preceding the date of application.

(b) A copy of the Type Certificate and the Type Certificate Data Sheet, where applicable (see HKAR-1 Sub-section 1.2-2).

(c) A Flight Manual conforming to Hong Kong requirements in cases where a Flight Manual has been issued (see HKAR-1 Sub-section 1.7-2).

(d) The national requirements with which the aircraft complies, giving title, issue number and effective date.

(e) Such deviations from the national requirements as may have been authorised in writing by the Authority which issued the Certificate of Airworthiness.

(f) An electrical load analysis covering all services.

(g) A copy of the Master Minimum Equipment List (MMEL).

3.2 During the investigation of the aircraft, the Director-General may decide that additional requirements must be met and these will be listed as Additional Requirements for Import in writing to the applicant. Additional Requirements for Import, when established by the Director-General, will not be confidential to the applicant and may be made available by the Director-General on request (see HKAR-1 Sub-section 1.2-2 and the

15 August 2011 1.3-2 P.2 Issue 2 Revision 5
Appendix No. 1).

4 FOR USED AIRCRAFT

4.1 The applicant shall provide to the Director-General:

(a) The information specified in paragraph 3.1 (b) to (g).

(b) The original Certificate of Airworthiness or Export Certificate of Airworthiness issued by the State of Manufacture.

(c) A Certificate of Airworthiness for Export issued by the exporting airworthiness authority within 60 days immediately preceding the date of application.

NOTE: (1) When the document referred to in paragraph 4.1(c) is not obtainable, the Director-General will accept the following documents in combination as a transfer document:

A current domestic Certificate of Airworthiness

PLUS

The following statement signed by the National Aviation Authority of the last State of Registry within a period 60 days immediately preceding the date of application:

"To whom it may concern:

REGISTRATION TYPE MANUFACTURER'S No.

The [National Aviation Authority (NAA)], having inspected the above aircraft and its records, hereby certifies that the aircraft is in accordance with: Type Certificate Data Sheet (TCDS) and is in an airworthy condition.

All Airworthiness Directives applicable to the type and all relevant maintenance activities have been addressed, with the exceptions previously agreed by the Director-General of Civil Aviation listed below.

The [NAA] further declares that, had the aircraft been presented for issue/renewal of its Certificate of Airworthiness or the issue of an Export Certificate of Airworthiness, such a certificate would have been issued."

(2) When an applicant wishes to import an aircraft which was operated immediately prior to import under military control in the previous State of Registry, the Director-General of Civil Aviation must be contacted to
establish whether the aircraft will be eligible for the issue of a Certificate of Airworthiness.

4.2 Reports

4.2.1 For aircraft with a MTWA above 15000 kg, the applicant through the medium of the Type Certificate Holder (if appropriate) or a design organisation approved in accordance with HKAR-1 Sub-section 1.8-8 Group E3, shall provide reports (See Appendix No. 1 to HKAR-1 Sub-section 1.8-8) confirming that the airworthiness and design standard of the aircraft, including its Flight Manual and instructions for continued airworthiness, conforms to a standard approved by the Director-General for the aircraft type or differs in a defined manner from the CAD approved standard.

NOTE: In the case where the issue of a Certificate of Airworthiness is to be completed outside Hong Kong at a place where an organisation is not specifically approved to provide reports for the purpose, the overseas organisation shall be one that is acceptable to the Director-General.

4.2.2 - For aircraft with a MTWA below 15000 kg, the applicant shall, either through the medium of a Group E3 Design Organisation, or, the Type Certificate Holder (if appropriate), or, a suitably Approved Maintenance Organisation, provide reports and data (See Appendix No. 1 to HKAR-1 Sub-section 1.8-8) confirming that the airworthiness and design standard of the aircraft, including its Flight Manual and instructions for continued airworthiness, conforms to a standard approved by the Director-General for the aircraft type or differs in a defined manner from the CAD approved standard. Subject to agreement with the Director-General, appropriately licensed aircraft maintenance engineers for aircraft types not listed in paragraph 14 of Airworthiness Notice No. 10 may produce such reports. The use of the services of a Group E3 approved organisation is recommended, particularly where the work to establish compliance is significant.

4.3 The aircraft and the relevant records shall be reviewed to determine the work to be undertaken to maintain the airworthiness of the aircraft. The aircraft and associated records must be made available at facilities suitable for the purpose.

4.3.1 In determining the work to be undertaken on the aircraft, due account shall be taken of (a) to (f).

(a) The age, areas and types of operation, and conditions of storage
5 GENERAL

5.1 The applicant shall carry out any work on the aircraft which the Director-General may decide is necessary.

5.2 All work undertaken in connection with the issue of the Certificate of Airworthiness for the aircraft shall be supervised by an organisation appropriately approved by the Director-General for the purpose or under the supervision of an appropriately licensed aircraft maintenance engineer.

NOTE: In the case of the inspection being completed abroad at a place where an organisation is not specifically approved for the purpose, the overseas organisation shall be one that is acceptable to the Director-General.

5.3 The aircraft shall be in a condition acceptable to enable the Director-General to inspect it as necessary.

5.4 The aircraft shall be weighed, and copies of the Weight and Centre of Gravity Schedule and, where appropriate the Weight and Balance Report shall be provided (see HKAR-1 Sub-section 1.5-4). The Director-General may agree to the acceptance of weight and centre of gravity details obtained from current documents relating to the aircraft.

5.5 When required by the Director-General, a Certificate of Fitness for Flight (see HKAR-1 Sub-section 1.3-8) shall be issued, and the aircraft shall be tested in flight to schedules approved by the Director-General in accordance with HKAR-1 Sub-section 1.3-3. Particulars and results of such testing shall be
HKAR-1

provided to the Director-General.

5.6 To facilitate delivery of aircraft to Hong Kong, the Director-General may, under appropriate circumstances, issue a Hong Kong Certificate of Airworthiness for Ferry purposes.

5.6.1 For New Aircraft – The Private Category Certificate of Airworthiness for Ferry purposes may be validated by the foreign Authority on behalf of the Director-General, subject to initial issue by that Authority of the appropriate Certificate of Airworthiness.

5.6.2 For Used Aircraft – The Private Category Certificate of Airworthiness for Ferry purposes will only be issued following a survey by a CAD Airworthiness Officer, in order to be satisfied that the Type Design standard and condition of the aircraft are appropriate for the issue of a Hong Kong Certificate of Airworthiness.

6 MAINTENANCE REVIEW BOARD

To determine the initial maintenance and inspection requirements, a Maintenance Review Board (see HKAR-1 Sub-section 1.5-2) will normally be established for all prototype aircraft the MTWA of which exceeds 5700 kg, prior to Hong Kong Transport Category certification.

7 MAINTENANCE, OVERHAUL AND REPAIR MANUALS

7.1 Copies of manuals required by HKAR-1 Sub-section 1.5-3 shall be provided. In the case of an aircraft of a type for which a Hong Kong Certificate of Airworthiness has not previously been granted, one copy of these documents shall be supplied to the Director-General, together with a complete set of all Service Bulletins.

7.1.1 Before the issue of a Hong Kong Certificate of Airworthiness, all relevant manuals shall be amended, where necessary, in respect of modifications embodied by the applicant before acceptance of the aircraft for certification, and one copy of the amendment shall be supplied to the Director-General. In the case of an aircraft type for which a Hong Kong Certificate of Airworthiness has not previously been granted, the applicant shall supply one copy of each finally accepted manual to the Director-General.

7.1.2 It shall be the responsibility of the applicant to make the necessary arrangements with the aircraft manufacturer / type design organisation.
to receive amendments to these manuals together with any service bulletins that may be issued from time to time.

7.1.3 It shall be the responsibility of the applicant to obtain, in respect of the aircraft, such additional technical information as the Director-General may require.

8 FLIGHT AND CREW MANUALS

8.1 A copy of the Flight Manual shall be provided (see HKAR-1 Sub-section 1.7-2).

8.2 A copy of the Crew Manual shall be provided (see HKAR-1 Sub-section 1.7-3).

9 RECORDS AND LOG BOOKS

9.1 In accordance with the Air Navigation (Hong Kong) Order 1995 a Certificate of Release to Service shall be entered in or attached to the appropriate log books or other maintenance records (see HKAR-1 Sub-section 1.6-7).

9.2 All relevant inspection records shall be made available to the Director-General for examination, and shall not be destroyed without authorisation from the Director-General.

10 MAXIMUM APPROVED PASSENGER SEATING CONFIGURATION AND MAXIMUM CERTIFICATED PASSENGER SEATING CAPACITY

10.1 Airworthiness and Operational Requirements are often expressed in terms of number of passengers carried, such as:
- persons carried;
- carrying (number) persons;
- (number) of persons on board;
- a total seating capability;
- a total seating capability authorised by the Certificate of Airworthiness;
- authorised to carry (number) passengers;
- passenger seating capability;
- certificated for (number) passengers;
- certificated to carry (number) passengers;
- configurated to carry (number) passengers.

Note: The above listing is not exhaustive. Advice from the Director-General should be...
sought should there be any doubt on the applicability of an Airworthiness or Operational Requirement that is dependent on the number of passengers carried.

10.2 The aforementioned number of passengers carried should be interpreted to mean the Maximum Approved Passenger Seating Configuration (MAPSC). The MAPSC is the maximum passenger seating capacity of an individual aircraft, excluding pilot seats or flight deck seats and cabin crew seats as applicable, used by the operator, approved by the Director-General and specified in the Certificate of Airworthiness. The MAPSC shall be specified in the individual Aircraft Flight Manual or its supplement. The passenger seats certified for take-off and landing shall be clearly identified on a LOPA as part of the MAPSC presentation in the Aircraft Flight Manual or its supplement.

10.3 - In addition, when an Airworthiness or Operational Requirement is expressed in terms of maximum type certificated passenger capacity, the applicability of which should be interpreted to mean Maximum Certificated Passenger Seating Capacity (MCPSC). The MCPSC is the maximum number of passenger seats, excluding crew seats, approved during type certification of an aircraft, and specified in the Type Certificate Data Sheet.

11 VALIDITY

Certificate of Airworthiness is normally issued with a validity of 12 months.
SECTION 1.3

SUB-SECTION 1.3-3

FLIGHT TESTING FOR ISSUE OF A CERTIFICATE OF AIRWORTHINESS OR A PERMIT TO FLY

1 GENERAL

1.1 The flight testing of Series aircraft under investigation for the issue of a Certificate of Airworthiness or a Permit to Fly shall comply with the procedures set out in this Sub-section 1.3-3.

NOTE: Owners are required to arrange adequate insurance to cover damage to the aircraft and to third parties.

1.2 All owners of aircraft to be flown by a CAD Approved Test Pilot for any test purposes are required to ensure that insurance policies covering damage to the aircraft and third parties are suitably endorsed to provide appropriate cover against any claims which may be made against the Director-General or the test pilot, arising out of the test flight.

1.3 In order that the Director-General may accept reports on flight test matters, the qualifications and experience of personnel involved in flight testing under the provisions of this Sub-section shall be acceptable to the Director-General. The pilots or flight crew shall be appropriately licensed for the particular type of aircraft concerned and competent to conduct the test laid down in the Airworthiness Flight Test Schedule.

1.4 Except where the Director-General requires additional pilots or flight crew to be carried out for a particular Airworthiness Flight Test, the number of persons conducting the test should be confined to the crew specified in the Certificate of Airworthiness (flight manual).

1.5 Flight test personnel shall be provided with adequate facilities and equipment for the effective performance of their duties.

NOTE: Organisations approved in accordance with Sub-section 1.8-9 to fly aircraft under 'B' Conditions of the Air Navigation (Hong Kong) Order 1995 comply with this requirement.

2 APPLICATION

2.1 The following requirements and procedures are applicable where first
application is made for the issue of a Hong Kong Certificate of Airworthiness or a Permit to Fly in respect of a Series aircraft.

2.2 General

2.2.1 Flight tests shall be completed to establish that:-

(a) Handling characteristics are satisfactory and typical of the type.

(b) Climb performance equals or exceeds the scheduled data.

NOTE: Data is necessary in order to assess any future deterioration of performance in service.

(c) The aircraft and its equipment function satisfactorily.

(d) Additional Requirements and Special Conditions, where applicable, have been complied with.

2.2.2 Series aircraft shall be tested in accordance with (a) or (b), as appropriate.

(a) New Aircraft

The flight tests shall be conducted by the Approved Test Pilots under the supervision of the aircraft Type Design Organisation.

Upon completion of five satisfactory flight tests since the first delivery of the new series aircraft, compliance can also be achieved by means of a production flight test conducted by the Type Design Organisation on the subsequent delivery aircraft. The subsequent delivery aircraft may be added directly to the Fleet Testing Programme in accordance with Sub-section 1.3-5. The written agreement of the Director-General is required.

(b) Used Aircraft

Where the aircraft type and origin are well known to the Director-General, the flight testing may be conducted by the Approved Test Pilots. However, the Director-General may notify the applicant of his intention to carry out, or participate in, flight tests.
Where the Director-General has notified the applicant of his intention to carry out, or participate in, flight tests, the applicant shall, when requested, provide adequate opportunities for the Director-General to become re-familiar with the aircraft type.

2.2.3 A flight test report, in a form acceptable to the Director-General, shall be provided. The Director-General may require any of the tests to be repeated, either by the applicant or by the Director-General.

3 FLIGHT TEST SCHEDULE

3.1 The flight tests shall be made to the Airworthiness Flight Test Schedule (see Appendix No. 1 to this Sub-section) for the type (see paragraph 3.2), or to such other schedule as may be agreed. Such a schedule shall contain details of the aircraft type to which it refers, shall be marked with a reference number, issue number, and date, and shall include the following:-

(a) Tests to check the aircraft performance.

(b) Tests to check such handling qualities of the aircraft as have been agreed in consultation with the Director-General.

NOTE: It is convenient for the flight test schedule to contain the following handling tests, as these combine, in a brief form, checks on various flight characteristics.

(i) A qualitative assessment of the take-off.

(ii) An assessment of the trim of the aircraft and the effectiveness of primary flight controls and trimmers in steady flight.

(iii) Hover manoeuvres for helicopters.

(iv) Flight at maximum speed.

(v) Stalls in the take-off and landing configurations.

(vi) A qualitative assessment of the landing.

(c) Tests to check functioning of the aircraft equipment in flight.

(d) Such other tests as are requested by the Director-General.
NOTE: Controls, systems and equipment which are used regularly may be considered, for the purpose of this schedule, to have been checked on the basis of normal usage.

3.2 **Flight Test Results**

3.2.1 The flight test results, in a form acceptable to the Director-General, shall be submitted to the Director-General for acceptance.

3.2.2 The flight test result shall include a certificate, in the following form, which shall be signed by the pilot who conducted the test.
FLIGHT TEST CERTIFICATE

Aircraft Type: ...........................................................
Registration: ...........................................................
Manufacturer's No.: ..................................................

I CERTIFY that I have tested the above aircraft to Airworthiness Flight Test Schedule reference ...........................................................

The following deficiencies and unsatisfactory features were revealed by the flight tests or noted at other times during the flight(s) and I CONSIDER that those annotated 'R' and/or 'FT' should be dealt with as follows:-

(a) Those annotated 'R' should be rectified prior to the issue of the Certificate of Airworthiness or flight for hire or reward, whichever occurs first.

(b) Those annotated 'FT' re-assessed in flight, following remedial action, before the defect can be considered to be rectified.

1 .........................................................................................
2 .........................................................................................
3 .........................................................................................
4 (etc.) ............................................................................

The above have been transcribed to ...........................................for rectification and clearance.

Pilot ........................................ Signed .................................
Date ........................................ Licence No. .........................
APPENDIX NO. 1 TO SUB-SECTION 1.3-3

FLIGHT TEST SCHEDULES
FOR ISSUE AND RENEWAL OF CERTIFICATES OF AIRWORTHINESS

1 PURPOSE

The purpose of this Appendix is to record policy and provide guidance to person(s) involved in flight testing for the issue and renewal of the Certificate of Airworthiness of an aircraft.

2 FLIGHT TEST SCHEDULES

UKCAA Airworthiness Flight Test Schedules are published by the United Kingdom Civil Aviation Authority. Their status is that they are recognised by the Director-General as an acceptable basis for showing compliance with the flight test requirement as required by the Air Navigation (Hong Kong) Order 1995.
SECTION 1.3

SUB-SECTION 1.3-4

RENEWAL OF CERTIFICATE OF AIRWORTHINESS

1 INTRODUCTION

1.1 General

1.1.1 The renewal of a Certificate of Airworthiness shall be subject to compliance with the procedures set out in this Sub-section 1.3-4.

1.1.2 For the purpose of Sub-section 1.3-4 and 1.3-5, aircraft are grouped in accordance with Maximum Total Weight Authorised (MTWA), type of design and Certificate of Airworthiness Category, as follows:

(a) **Group I**

All aircraft not included in Group II.

(b) **Group II**

Piston-engined aeroplanes and rotorcraft the MTWA of which does not exceed 2730kg, certificated in the Transport Category (Passenger), Transport Category (Cargo), Aerial Work Category and Private category.

1.2 Applicability

1.2.1 For each Group, compliance shall be shown with the requirements, as follows:

(a) **Group I**

The requirements of paragraphs 2, 3, 5, 6 and 7.

(b) **Group II**

The requirements of paragraphs 2, 4, 5, 6 and 7.
2 APPLICATION

2.1 CAD Form DCA 46C, copies of which can be obtained from the CAD website http://www.cad.gov.hk, shall be completed and returned to the same address at least 14 days but within 30 days before the expiry date of the Certificate of Airworthiness. The charge is prescribed in the Hong Kong Air Navigation (Fees) Regulations.

2.2 The applicant should provide the following documents for examination by the Director-General:

(a) A copy of an inspection report giving brief details of the work done since the last renewal of the Certificate of Airworthiness. This report should include the following documents:

(i) A record of the work accomplished since the last renewal of the Certificate of Airworthiness.

(ii) A record showing details of major checks carried out since the last renewal of the Certificate of Airworthiness.

(iii) A record of airframe, engine and propeller flying hours as follows:

- The total flying hours/cycles for the airframe since new and the flying hours since the last renewal of the Certificate of Airworthiness.

- The total flying hours/cycles for the engine(s) since new and the flying hours since the last overhaul.

- The total flying hours for the propeller(s) since new and the flying hours since the last overhaul.

(iv) A record showing compliance with Service Bulletins, modifications and Airworthiness Directives. Unless otherwise agreed, the record should include the Modification Record Book when required. (See HKAR-1 Sub-section 1.7-9.)

(v) A record of major component changes.

(b) A weight and balance report, which should include a copy of the weight determination record, the weight and centre of gravity schedule and a list of the basic equipment. (See HKAR-1 Sub-section 1.6-4.)
(c) A flight test report for the aircraft. (See HKAR-1 Sub-section 1.3-5.)

(d) A copy of the Certificate of Maintenance Review issued for the review of maintenance accomplished since the last renewal of Certificate of Airworthiness. (See HKAR-1 Sub-section 1.6-2.)

NOTE: Certificate of Maintenance Review is not required for aircraft certificated in the Private Category.

(e) A summary of compliance status of the Definitive List of Hong Kong Airworthiness Notices.

2.3 If, for the investigation, travel outside Hong Kong is necessitated, the applicant will be required to meet the additional costs.

3 PROCEDURE NO. 1 FOR GROUP I AIRCRAFT

3.1 The aircraft and its records shall be in a condition acceptable to the Director-General, for such inspections that are considered necessary.

3.2 The aircraft inspection and the review of the records shall be carried out by an appropriately approved organisation (see Note 1 to paragraph 3.2.2) to determine the work to be undertaken to maintain the airworthiness of the aircraft.

3.2.1 The physical inspection of the aircraft for the purpose of making a recommendation for the renewal of the Certificate of Airworthiness shall be completed in the 30 days prior to making the renewal recommendation.

3.2.2 Where an inspection is carried out on an aircraft, for the purpose of the renewal recommendation of the Certificate of Airworthiness, the inspection shall be carried out at the premises approved for the purpose and a report and renewal recommendation shall be prepared by an appropriately approved organisation (see HKAR-1 Sub-sections 1.8-14 and 1.8-15). A copy of the report detailing the work required shall be retained by the organisation and made available to the Director-General upon request.

NOTE:(1) It shall be the responsibility of the approved organisation, making the renewal recommendation, to determine the extent of any inspection required in order to be satisfied the
aircraft remains in compliance with applicable certification and airworthiness requirements.

(2) In the case of the renewal being completed abroad at a place where an organisation is not specifically approved for the purpose, the overseas organisation shall be one that is acceptable to the Director-General. The renewal process is to be predicated upon an inspection report prepared by an authorised person or an appropriately licensed aircraft maintenance engineer. A copy of the report detailing the work required shall be sent to the Director-General. In such cases, the Director-General may decide that Airworthiness Officer involvement is necessary (see paragraph 2.3).

3.2.3 In determining the work to be undertaken on the aircraft, due account shall be taken of the following:

(a) The age, storage conditions, total hours/cycles, areas and type of operation of the aircraft.

(b) Compliance with the requirements of the Approved Maintenance Schedule (see HKAR-1 Sub-sections 1.6-2 and 1.7-5).

(c) Work certified in the relevant records.

(d) The periods between overhauls and any finite or service life limits, prescribed or approved by the Director-General, in respect of the aircraft and its parts.

(e) Such other requirements or instructions, approved by the Director-General relating to the maintenance of airworthiness.

(f) Mandatory modifications and inspections prescribed by the Director-General (see HKAR-1 Sub-section 1.6-6), where appropriate, in respect of the aircraft and its parts.

(g) The manufacturer's recommendations in Service Bulletins, Maintenance Manuals, Maintenance Planning Documents (MPD) or equivalent documents.

(h) Compliance with the Type Certificate Data Sheet (TCDS).
NOTE: Items (b) to (g) may be covered by a Condition Monitored Maintenance Programme approved by the Director-General (see Appendix No. 1 to HKAR-1 Sub-section 1.6-2).

3.2.4 The Director-General may determine the work required to be carried out on the aircraft.

3.3 All work undertaken in connection with the renewal of the Certificate of Airworthiness of the aircraft shall be supervised by an organisation approved by the Director-General (see HKAR-1 Sub-sections 1.8-14 and 1.8-15) at a place where the equipment, the general conditions and the necessary supervisory procedures are to a standard approved by the Director-General. Before the work is finally certified, the approved organisation shall be satisfied that the work has been carried out, inspected, and tested where necessary, for conformity with the specifications, drawings and instructions relating to the approved design and with the requirements for the continuing airworthiness of the aircraft and its equipment.

3.4 The recommendation for the renewal of the Certificate of Airworthiness shall be made on a form acceptable to the Director-General by the approved organisation. When completed one copy shall be forwarded to the Director-General. A copy of the form shall be included in the aircraft records and an additional copy shall be retained by the approved organisation.

3.5 The Certificate of Airworthiness renewal recommendation may be anticipated by a maximum of 30 days before the date of expiry without loss of validity. If the Certificate of Airworthiness has expired, the validity will take effect from the date the submission is received and accepted by the Director-General.

3.6 The aircraft shall have been tested in flight in accordance with HKAR-1 Sub-section 1.3-5. Where a flight test is necessary and the Certificate of Airworthiness has expired, a Certificate of Fitness for Flight (see HKAR-1 Sub-section 1.3-8) shall have been issued to allow the aircraft to be flown under "A Conditions".

4 PROCEDURE NO. 2 FOR GROUP II AIRCRAFT

4.1 The aircraft and its records shall be in a condition acceptable to the Director-General for such inspections as are considered necessary.

4.2 A coincident annual inspection shall be carried out at the premises of an organisation approved for the purpose in accordance with HKAR-1 Sub-section 1.8-15 and certified by holders of Hong Kong Aircraft Maintenance
Licences with Type Ratings valid for the particular aircraft type.

NOTE: The Director-General may accept a holder of Hong Kong Aircraft Maintenance License with Type Rating valid for the particular aircraft type to carry out the coincident annual inspection and not necessarily at the premises of an organisation approved for the purpose in accordance with HKAR-1 Sub-section 1.8-15.

4.3 For aircraft operated for public transport, the coincident annual inspection shall be carried out at the premises of a suitably approved HKAR-145 organisation and certified by persons holding appropriate company authorisations valid for the particular aircraft type.

NOTE: (1) In the case of the renewal being completed abroad at a place where an organisation is not specifically approved for the purpose, the overseas organisation shall be one that is acceptable to the Director-General. The renewal process is to be predicated upon an inspection report prepared at the agreed site by the HKAR-1 Sub-section 1.8-15 organisation's nominated person. A copy of the report detailing the work required shall be sent to the Director-General. In such cases, the Director-General may decide that Airworthiness Officer involvement is necessary (see paragraph 2.3).

(2) The Director-General may accept a holder of Hong Kong Aircraft Maintenance License with Type Rating valid for the particular aircraft type to carry out the coincident annual inspection and not necessarily at the premises of an organisation approved for the purpose in accordance with HKAR-145.

4.4 In deciding the depth of the inspection and the extent of the work to be undertaken to maintain the airworthiness of the aircraft and to enable the recommendation for the renewal of the Certificate of Airworthiness to be made, the approved organisation shall take account of the following:

(a) The age, storage conditions, total hours/cycles, areas and type of operation of the aircraft.

(b) Compliance with the requirements of the Approved Maintenance Schedule.

(c) Work certified in the relevant records.

(d) The periods between overhaul and any finite or service life limits.
prescribed or approved by the Director-General, in respect of the aircraft and its parts.

(e) Such other requirements or instructions, approved by the Director-General relating to the maintenance of airworthiness.

(f) Mandatory modifications and inspections prescribed by the Director-General, where appropriate, in respect of the aircraft and its parts (see HKAR-1 Sub-section 1.6-6).

(g) The manufacturer's recommendations in Service Bulletins, Maintenance Manuals, or equivalent documents.

(h) Compliance with the Type Certificate Data Sheet (TCDS).

4.5 Following the coincident annual inspection, an inspection report, in which any work which has been undertaken is detailed, shall be prepared, certified, and included in the aircraft records.

4.6 All work undertaken in connection with the renewal of the Certificate of Airworthiness of the aircraft shall be supervised by an organisation approved in accordance with HKAR-1 Sub-section 1.8-15. Before the work is finally certified, the approved organisation shall be satisfied that the work has been carried out, inspected, and tested where necessary, for conformity with the specifications, drawings and instructions relating to the approved design, and with the requirements for the continuing airworthiness of the aircraft and its equipment.

NOTE: The Director-General may accept a holder of Hong Kong Aircraft Maintenance License with Type Rating valid for the particular aircraft type in lieu of the required supervision by the HKAR-1 Sub-section 1.8-15 approved organisation.

4.7 The recommendation for the renewal of the Certificate of Airworthiness shall be made on a form acceptable to the Director-General by the organisation. When completed, one copy shall be forwarded to the Director-General. A copy of the form shall be included in the aircraft records and an additional copy shall be retained by the organisation.

4.8 The Director-General may survey an aircraft during the coincident annual inspection. The Director-General may then decide on the extent of the investigation and on any additional work required to permit renewal of the Certificate of Airworthiness. The cost of any such additional survey shall be met by the applicant.
4.9 The Certificate of Airworthiness renewal recommendation may be anticipated by a maximum of 62 days from the date of expiry without loss of validity. If the Certificate of Airworthiness has expired the validity shall take effect from the date the submission is received and accepted by the Director-General.

4.10 The aircraft shall have been tested in flight, in accordance with HKAR-1 Sub-section 1.3-5. Where a flight test is necessary and the Certificate of Airworthiness has expired a Certificate of Fitness for Flight (see HKAR-1 Sub-section 1.3-8) shall have been issued to allow the aircraft to fly under 'A Conditions'.

5 RE-WEIGHING OF AIRCRAFT

5.1 Re-weighing of aircraft at the time of renewal of the Certificate of Airworthiness will be dependent on the date of the last weighing, and on the history of the aircraft.

5.1.1 Aircraft of more than 5700 kg MTWA shall be re-weighed within two years after the date the Certificate of Airworthiness is first issued in Hong Kong, and subsequent check weighing shall be carried out at intervals not exceeding five years, and at such other times as the Director-General may require.

5.1.2 Aircraft of 5700 kg MTWA or less, shall be re-weighed at such times as the Director-General may require.

5.1.3 The Director-General shall be consulted if there is any doubt as to whether the aircraft ought to be re-weighed.

5.1.4 When re-weighing is necessary, an amended Weight and Centre of Gravity Schedule, or its equivalent as prescribed in HKAR-1 Sub-section 1.5-4, shall be prepared. During the course of any re-weighing procedures, the accuracy of all data previously recorded (for example lever arms) shall be checked against the appropriate manufacturer's current data.

5.1.5 At the time of a re-weighing or when a revised Weight and Centre of Gravity Schedule is raised following the addition, removal or relocation of equipment, a copy of the Weight and Centre of Gravity Schedule shall be retained by the approved organisation and submitted to the Director-General at the time of renewal of the Certificate of Airworthiness.
6  RECORDS AND LOG BOOKS

6.1 Aircraft records in the form of log books, separate maintenance records forming part of log books, or maintenance records kept by any other method approved by the Director-General, shall be made available to the Director-General, if specifically requested by the Director-General.

NOTE: The Air Navigation (Hong Kong) Order 1995 requires that log books, and other documents which are identified and referred to in the log books (therefore, forming part of the log books), shall be preserved until a date two years after the aircraft, engine or variable pitch propeller has been destroyed or permanently withdrawn from use.

6.2 All relevant inspection records shall be made available to the Director-General, if specifically requested by the Director-General.

6.2.1 Inspection records shall not be destroyed without authorisation from the Director-General.

6.3 Full particulars of the work done relating to the renewal of the Certificate of Airworthiness shall be entered in the appropriate log book(s) or other approved maintenance records, and a Certificate of Release to Service shall be completed and attached or included, as appropriate (see HKAR-1 Sub-section 1.6-7).

6.3.1 When it is more convenient, particulars of the work done may be entered in a separate maintenance record which shall be certified in the same manner as that required for entries in the log books. The reference number of this record, and the place where it may be examined, shall be entered in the log books under a brief description of the particular work. The record thereafter forms part of the log book and a copy should be supplied to the owner.

NOTE: Compliance with Airworthiness Directives, Service Bulletins, modifications, component replacements and scheduled checks carried out at the time, must be individually referenced in the aircraft, engine or propeller log book as appropriate.

7  MANUALS

7.1 A check shall be made by the approved organisation or an appropriately
HKAR-1

licensed aircraft maintenance engineer to ensure that the Flight Manual is up to date, and any necessary action to bring it up to date shall be taken. Confirmation of the correct Flight Manual amendment status shall be provided to the Director-General. The Flight Manual shall be made available to the Director-General, if specifically requested by the Director-General.


7.2 Maintenance, Overhaul and Repair Manuals used shall be up to date, and they shall be amended in accordance with the procedures set out in HKAR-1 Sub-section 1.7-4 to incorporate such amendments necessary to cover the physical state of the aircraft.

8 VALIDITY

Certificate of Airworthiness is normally renewed with a validity of 12 months.
SECTION 1.3

SUB-SECTION 1.3-5

FLIGHT TESTING FOR RENEWAL OF CERTIFICATES OF AIRWORTHINESS OR PERMITS TO FLY

1 GENERAL

1.1 Flight tests shall be completed periodically to ensure that the aircraft flight characteristics and the functioning in flight of the aircraft do not differ significantly from those acceptable to the Director-General for the aircraft type.

NOTE: All owners of aircraft to be flown by a CAD Approved Test Pilot for any test purposes are required to ensure that insurance policies covering damage to the aircraft and third parties are suitably endorsed to provide appropriate cover against any claims which may be made against the Director-General or the test pilot, arising out of the test flight.

1.2 In order that the Director-General may accept reports on flight test matters, the qualifications and experience of personnel involved in flight testing under the provisions of this Sub-section shall be acceptable to the Director-General. The pilots or flight crew shall be appropriately licensed for the particular type of aircraft concerned and competent to conduct the test laid down in the Airworthiness Flight Test Schedule.

1.3 Except where the Director-General requires additional pilots or flight crew to be carried out for a particular Airworthiness Flight Test, the number of persons conducting the test should be confined to the crew specified in the Certificate of Airworthiness (flight manual).

1.4 Flight test personnel shall be provided with adequate facilities and equipment for the effective performance of their duties.

NOTE: Organisations approved in accordance with Sub-section 1.8-9 to fly aircraft under 'B' Conditions of the Air Navigation (Hong Kong) Order 1995 comply with this requirement.

1.5 Airworthiness Flight Tests shall be completed in accordance with (a), (b) or (c) as appropriate:-

(a) In respect of aircraft classified in Group I in accordance with Sub-section 1.3-4, either:-

(i) annually; or
(ii) as defined by a fleet testing programme agreed between the Director-General and the Operator, Maintenance Organisation or other Organisation acceptable to the Director-General.

(b) In respect of aircraft classified in Group II in accordance with Sub-section 1.3-4, within the period of 62 days immediately preceding the date of renewal of the Certificate of Airworthiness.

(c) In respect of aircraft to which Sub-section 1.3-7 is applicable, within the period of 62 days immediately preceding the date of renewal of the Permit to Fly.

1.6 Airworthiness Flight Tests may normally be conducted under the supervision of the Operator or Maintenance Organisation or other Organisation acceptable to the Director-General, provided that the pilot/flight crew is approved by the Director-General for that purpose. In the case of turbo-jet aircraft with a Maximum Total Weight Authorised exceeding 15000 kg, the pilot shall have been specifically briefed and approved for the task by the Director-General.

NOTE: The acceptability of a pilot will be evaluated against his competence, having regard to his previous conduct and experience and his familiarity with the appropriate test schedule, flight test techniques and safety precautions.

1.7 The Certificate of Airworthiness of a particular aircraft may be renewed without conducting the required flight testing if sufficient justifications can be provided:

(a) For aircraft not operated under a fleet testing programme, after the aircraft has completed the initial flight test during the issuance of Certificate of Airworthiness, the Director-General may agree to vary the time period between consecutive flight tests based upon satisfactory results. The maximum time period between consecutive tests on individual aircraft shall not exceed 10 years.

(b) For aircraft operated under a fleet testing programme, the Director-General may agree to vary the frequency and the maximum time period between consecutive tests on individual aircraft, based upon satisfactory results. If Operator or Maintenance Organisation can demonstrate that particular ground tests meet the requirements laid down in the Airworthiness Flight Test Schedule, a full test flight may not be required. The Director-General may consider, with justification, to reduce the content of the Airworthiness Flight Test Schedules.
NOTE:  (1) The Director-General may require to carry out a proportion of these flight tests, and will notify the Operator or Maintenance Organisation accordingly.

(2) The intent of the reductions in test frequency and/or flight test items is to eliminate any tests which have produced consistently satisfactory results over several years and to avoid duplication of tests between the Airworthiness Flight Test Schedule and the ground maintenance schedule, where such duplication cannot be justified. Continued duplication could be justified on grounds of unsatisfactory results from previous tests or limited validity of the ground check involved.

2 FLIGHT TEST SCHEDULES

2.1 Airworthiness Flight Test Schedules

The flight tests shall be made in accordance with (a) or (b):-

(a) To the appropriate Airworthiness Flight Test Schedule (see Appendix No. 1 to Sub-section 1.3-3) acceptable to the Director-General; or

(b) To a schedule, approved by the Director-General, containing, as a minimum, the tests laid down in the Airworthiness Flight Test Schedule. Such a schedule shall contain details of the aircraft type to which it refers, shall be marked with a reference number, issue number, and date, and shall include the following:-

(i) Tests to check the aircraft performance.

(ii) Tests to check that the handling characteristics are satisfactory and have not deteriorated with time.

NOTES: (1) The tests will take account of the flying characteristics of the aircraft revealed during flight tests on the Prototype, the results of tests on Series aircraft and the history of the aircraft.

(2) It is convenient for the flight test schedule to contain the following handling tests, as these combine, in a brief form, checks on various flight characteristics.

(i) A qualitative assessment of the take-off.

(ii) An assessment of the trim of the aircraft and the effectiveness of primary flight controls and trimmers, in steady flight.

(iii) Hover manoeuvres for helicopters.

(iv) Flight at maximum speed.
(v) Stalls in the take-off and landing configurations.

(vi) A qualitative assessment of the landing.

(iii) Tests to check functioning of the aircraft equipment in flight.

NOTE: Controls, systems and equipment which are used regularly may be considered, for the purpose of this schedule, to have been checked on the basis of normal usage.

3 FLIGHT TEST RESULTS

3.1 The flight test results, in a form acceptable to the Director-General, shall be submitted for acceptance to the Director-General.

3.2 The flight test results shall include a certificate, in the following form, which shall be signed by the pilot who conducted the test.
FLIGHT TEST CERTIFICATE

Aircraft Type: ..........................................................
Registration: ..........................................................
Manufacturer’s No.: ................................................

I CERTIFY that I have tested the above aircraft to Airworthiness Flight Test Schedule reference ........................................................

The following deficiencies and unsatisfactory features were revealed by the flight tests or noted at other times during the flight(s) and I CONSIDER that those annotated ‘R’ and/or ‘FT’ should be dealt with as follows:-

(a) Those annotated 'R' should be rectified prior to the renewal of the Certificate of Airworthiness or flight for hire or reward, whichever occurs first.

(b) Those annotated 'FT' re-assessed in flight, following remedial action, before the defect can be considered to be rectified.

1...............................................................................................................
2...............................................................................................................
3...............................................................................................................
4 (etc.) ...................................................................................................

The above have been transcribed to .......................................................... for rectification and clearance.

Pilot .............................................. Signed ............................................

Date .............................................. Licence No. .................................
FLEET TESTING PROGRAMMES

4.1 As an alternative to periodic airworthiness flight testing of individual aircraft, a programme of flight testing of sample aircraft from a fleet may be agreed with the Director-General, and such sampling will be accepted by the Director-General as being representative of fleet characteristics.

4.2 Basic Requirements

To be acceptable as a fleet and eligible for a fleet testing programme, the aircraft shall:

(a) Be of an acceptably similar type.

(b) Be certificated in the Transport Category and have a Maximum Total Weight Authorised exceeding 2730 kg.

(c) Be controlled by an Organisation, or Organisations acceptable to the Director-General.

(d) Have produced consistently satisfactory results in previous Airworthiness Flight Tests for an acceptable period of time.

NOTE: Each aircraft of the type will be subjected to an Airworthiness Flight Test at the end of its first year of operation and if data from such tests is sufficient to confirm compliance with (d), those aircraft which have proved to be satisfactory may be considered as eligible for setting up a fleet test programme in accordance with paragraph 4.3. If the data in respect of a particular aircraft is insufficient to confirm compliance with (d) then that aircraft will be subjected to further Airworthiness Flight Tests at the end of subsequent year(s). An aircraft may be added to an established fleet after one annual test, provided that the results of that test are satisfactory.

4.3 General

4.3.1 The size and make-up of each fleet shall be agreed with the Director-General.

4.3.2 For each agreed fleet, a flight testing programme shall be agreed with the Director-General.

4.3.3 The minimum annual sample required for each fleet shall be 20% of the fleet, or three aircraft, whichever is the lesser, but not less than one aircraft. The frequency and the maximum time period between consecutive tests on individual aircraft shall normally be as in Table 1, but the time period shall not exceed 10 years.
NOTE: Frequencies for some fleets of fixed-wing aircraft and for helicopter fleets may be set differently where the circumstances warrant testing at a higher frequency.
<table>
<thead>
<tr>
<th>NUMBER OF AIRCRAFT IN FLEET</th>
<th>YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1(A)</td>
<td>A</td>
</tr>
<tr>
<td>2(AB)</td>
<td>A</td>
</tr>
<tr>
<td>3(A-C)</td>
<td>A</td>
</tr>
<tr>
<td>4(A-D)</td>
<td>A</td>
</tr>
<tr>
<td>5(A-E)</td>
<td>A</td>
</tr>
<tr>
<td>6(A-F)</td>
<td>AB</td>
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<tr>
<td>7(A-G)</td>
<td>AB</td>
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<tr>
<td>8(A-H)</td>
<td>AB</td>
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<tr>
<td>9(A-I)</td>
<td>AB</td>
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<td>10(A-J)</td>
<td>AB</td>
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<tr>
<td>11(A-K)</td>
<td>ABC</td>
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<tr>
<td>12(A-L)</td>
<td>ABC</td>
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<tr>
<td>13(A-M)</td>
<td>ABC</td>
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<tr>
<td>14(A-N)</td>
<td>ABC</td>
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<tr>
<td>15(A-O)</td>
<td>ABC</td>
</tr>
<tr>
<td>16(A-P)</td>
<td>ABC</td>
</tr>
<tr>
<td>17(A-Q)</td>
<td>ABC</td>
</tr>
<tr>
<td>18(A-R)</td>
<td>ABC</td>
</tr>
<tr>
<td>19(A-S)</td>
<td>ABC</td>
</tr>
<tr>
<td>20(A-T)</td>
<td>ABC</td>
</tr>
<tr>
<td>21(A-U)</td>
<td>ABC</td>
</tr>
</tbody>
</table>

NOTE: For fleets of more than 21 aircraft, the fleet annual sample size should remain at 3 aircraft and the time between consecutive tests on individual aircraft should increase accordingly subject to the maximum interval laid down in paragraph 4.3.3.
4.3.4 The fleet testing programme shall be reviewed in the event of:-

(a) Any significant change to the aircraft in the fleet (e.g. a change of engine rating or type).

(b) Any failure to maintain the standards on which the programme was based.

(c) Any failure to carry out the programme.

5 OPERATING THE PROGRAMME

5.1 The Director-General shall be given the opportunity to participate in any flight test associated with the programme.

5.2 The programme shall be controlled under arrangements acceptable to the Director-General.

The programme may be controlled by:-

(a) The operator of the aircraft in the fleet, or

(b) The organisation responsible for the maintenance of the aircraft in the fleet, or

(c) In the case of an agreement between Operators to pool their fleets, a fleet co-ordinator nominated by the Operators.

5.3 The Director-General shall be kept informed of any changes to the size or make-up of the fleet, so that the programme may be amended as necessary.

5.4 The Director-General shall be kept informed of any failure to comply with the programme, so that the programme can be amended as necessary by the Director-General.

5.5 The Director-General may, where he considered it to be necessary, require an Airworthiness Flight Test to be carried out on any aircraft covered by the programme in any year (e.g. in order to correct for slippage, or to clarify any doubts about the flying qualities of individual aircraft or of the fleet).

5.6 Airworthiness Flight Tests shall be completed within the time period three months either side of the nominal date for the aircraft concerned.
SECTION 1.3

SUB-SECTION 1.3-6

STATEMENT OF CONFORMITY FOR EXPORT
FROM HONG KONG

1 INTRODUCTION

1.1 The issue of a Statement of Conformity for Export (hereinafter referred to as the 'SOC for Export') shall be subject to compliance with the procedure set out in this Sub-section 1.3-6.

1.2 The SOC for Export is not a statutory document, either internationally under ICAO or nationally under the Air Navigation (Hong Kong) Order 1995. When issued by the Director-General of Civil Aviation it signifies, as at the date of issue, that, except for those significant derogations from the requirements listed (see 4):

(a) in respect of a used aircraft, the aircraft is such that a Hong Kong Certificate of Airworthiness could be issued or renewed, as appropriate, in accordance with the Requirements.

1.3 The SOC for Export does not, by itself, give authority for the aircraft to be flown; such authority may, normally, be obtained in accordance with (a) or (b).

(a) The Authority responsible for airworthiness in the country in which the aircraft is to be registered (hereinafter referred to as the Responsible Authority) may issue a Certificate of Airworthiness.

(b) The Director-General may (in conjunction with the SOC for Export) issue a Certificate of Airworthiness such as would cover the delivery of the aircraft to its destination.

2 APPLICATION

2.1 The applicant shall write to the Director-General.

2.2 During the investigation, if it is necessary for an Officer to travel outside Hong Kong, the Director-General will require the applicant to meet the additional costs involved.
3 COMPLIANCE WITH REQUIREMENTS

3.1 When the Director-General is satisfied that compliance has been shown with this paragraph 3, the SOC for Export will be issued.

3.2 Additional Requirements and Special Conditions

Compliance shall be shown with any Additional Requirements or Special Conditions prescribed by the Responsible Authority and notified to the Director-General in writing.

3.3 Hong Kong Airworthiness Requirements

In addition to compliance with 3.2, compliance shall be shown with 3.3.1.

3.3.1 Used Aircraft of a Type Previously Certificated in Hong Kong

Compliance shall be shown with the requirements of Sub-section 1.3-4.

NOTES: (1) To qualify for the renewal of a Certificate of Airworthiness and hence the issue of an SOC for Export, aircraft below 2730 kg should have undergone a maintenance check, equivalent to an annual inspection and a Certificate of Release to Service issued in accordance with the Air Navigation (Hong Kong) Order 1995. The inspection should have been performed and properly documented within the 30 days immediately prior to the issue of the SOC for Export. For aircraft above 2730 kg consideration may be given to the maintenance check performed on an aircraft maintained in accordance with an approved maintenance inspection programme, i.e. an equalised or progressive inspection programme.

(2) In deciding the extent of rectification and overhaul work, account will be taken of maintenance history and the condition of the aircraft.

(3) Where the extent of work to be done on the aircraft prior to export is the subject of a contract, the Director-General may, where it is apparent that the full certification requirements are not intended to be met, require the Applicant to obtain from the Responsible Authority a written confirmation that the contractual arrangements are acceptable. The SOC for Export will be qualified accordingly.

4 DEROGATIONS FROM THE REQUIREMENTS

4.1 The following will be listed on the SOC for Export:

(a) Significant deviations from the approved build standard.
(b) Derogations from Hong Kong Airworthiness Requirements, Additional Requirements, and Special Conditions.

(c) Mandatory modifications and inspections with which compliance has not been shown.

(d) In respect of equipment prescribed in the Air Navigation (Hong Kong) Order 1995:-(
   
   (i) Such equipment which is fitted, but has not been approved by the Director-General.
   
   (ii) Equipment appropriate to the certification Category, where this is not fitted.

4.2 Any item listed in accordance with 4.1 shall be confirmed, in writing, to be acceptable to the Responsible Authority prior to the issue of the SOC for Export.

5 ISSUE OF SOC FOR EXPORT

5.1 The aircraft is required to be de-registered at the time of issuing of the SOC for Export.
SECTION 1.3

SUB-SECTION 1.3-8

‘A CONDITIONS’

1 INTRODUCTION

‘A Conditions’ for flight are prescribed in Schedule 2 of the Air Navigation (Hong Kong) Order 1995.

2 REQUIREMENTS

Before an aircraft flies under ‘A Conditions’, the aircraft and its engine(s) shall be certified as fit for flight. A certificate of fitness for flight shall be issued before flight in accordance with paragraph 3 of this Sub-section.

3 CERTIFICATE OF FITNESS FOR FLIGHT

3.1 The Certificate shall be as follows:

<table>
<thead>
<tr>
<th>Nationality and Aircraft Serial</th>
<th>Engine</th>
<th>Engine S/N(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration Marks Number</td>
<td>Engine</td>
<td>Engine S/N(s)</td>
</tr>
</tbody>
</table>

It is hereby certified that the aircraft defined hereon has been inspected and is fit for flight provided it is properly loaded.

This Certificate is valid until .........................or until the airworthiness condition of the aircraft is altered, whichever is earlier.

Signed ................................................... AML Licence No .......................................

Signed ................................................... CAD Approval No ....................................

3.2 The period of validity shall be stated but shall not exceed 7 days.

3.3 The Certificate shall be issued in duplicate and one copy kept elsewhere than in the aircraft.
HKAR-1

3.4 A Certificate of Fitness for Flight shall be issued only by the following:

(a) The holder of an appropriately type rated HKAR-66 Aircraft Maintenance Licence in Category B1.

(b) An organisation approved by the Director-General under HKAR-145 where the Schedule of Approval refers to particular types of aircraft. The certifying staff who issues the certificate shall be a holder of an appropriately type rated HKAR-66 Aircraft Maintenance Licence in Category B1.

3.5 If the original airworthiness condition of the aircraft is affected during the period of validity, the Certificate shall be re-issued.
SECTION 1.3

SUB-SECTION 1.3-9

‘B CONDITIONS’

1 INTRODUCTION

‘B Conditions’ for flight are prescribed in Schedule 2 of the Air Navigation (Hong Kong) Order 1995.

2 FLIGHT TEST RISK ASSESSMENT (FTRA)

2.1 The Director-General has adopted the technical contents of the FAA Order 4040.26B for FTRA.

2.2 FTRA shall be conducted and submitted to the Director-General for application for flights under ‘B Conditions’.

2.3 Risk category shall be determined for the proposed flights in accordance with the FAA Order 4040.26B.

2.4 The risk category is classified as Low Risk, Medium Risk or High Risk.

3 REQUIREMENTS

3.1 Low Risk Flights

Before an aircraft flies under ‘B Conditions’ in low risk category, the aircraft and its engine(s) shall be certified as fit for flight. A Certificate of Fitness for Flight shall be issued before flight in accordance with HKAR-1 Sub-section 1.3-8, paragraph 3.

3.2 Medium or High Risk Flights

Flight under ‘B Conditions’ in medium risk or high risk category may only be undertaken by organisations approved in accordance with HKAR-1 Sub-section 1.8-9.
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SECTION 1.3
SUB-SECTION 1.3-11

AIRCRAFT RADIO INSTALLATIONS

1 APPLICATION FOR AIRCRAFT STATION LICENCE

1.1 An application form, copies of which may be obtained from the Office of the Telecommunications Authority, shall be completed and returned to that office. The Office of the Telecommunications Authority will forward a licence to the CAD Airworthiness Office, which becomes valid only when CAD Form DCA 141 'Approval of Aircraft Radio Installation' is issued by the Director-General, except that the licence authorises the applicant to carry out such ground and flight tests, before the Director-General issues the Approval, as are necessary to comply with paragraph 3.2.

2 APPLICATION FOR APPROVAL OF AIRCRAFT RADIO INSTALLATION

2.1 For an aircraft not having a Certificate of Airworthiness, the application for an Approval of Aircraft Radio Installation is a routine matter after the applicant has completed a formal application, on CAD Form DCA 46D (see HKAR-1 Sub-section 1.3-2), for a Certificate of Airworthiness.

2.2 Where the aircraft has already been issued with a Certificate of Airworthiness, and an Approval of Aircraft Radio Installation is desired, the applicant shall complete CAD Form DCA 282 in accordance with the Major Modification procedures in HKAR-1 Sub-section 1.2-5.

2.3 Where a modification, previously approved by the Director-General, has been incorporated in the aircraft introducing a radio installation and an Approval of Aircraft Radio Installation is desired, the applicant shall send to the CAD Airworthiness Office such documents as are necessary to give details of the modification, and also to show that the work has been certified in accordance with the procedures in HKAR-1 Sub-section 1.6-7.

3 APPROVAL OF AIRCRAFT RADIO INSTALLATION

3.1 Design

The applicant shall ensure that the design of the installation complies with:
(a) The Requirements in force at the time the application for an Approval of Aircraft Radio Installation is received by the Director-General.

(b) Such other requirements as the Director-General may notify in writing, for a particular installation.

3.1.1 All relevant design information, drawings and test reports shall be held at the disposal of the Director-General. No such design records shall be destroyed without authorisation from the Director-General.

3.1.2 Each design drawing shall bear a descriptive title, drawing number, issue number and date of issue. All alterations to drawings shall be made in accordance with a drawing amendment system which will ensure amendment to design records.

3.1.3 Immediately an alteration is made to a drawing, whether the alteration is permanent or temporary, the drawing shall be identified with a new issue number and date. Where an alteration affects the interchangeability of an item in any way, a new part number shall be issued such as to avoid confusion with the original item.

3.2 Survey, Ground and Flight Tests

The approval of an aircraft radio installation is based on a survey by the Director-General, followed by such ground and flight tests as are required in respect of the particular installation, to prove the satisfactory functioning of the installation.

3.2.1 The applicant shall arrange with the Director-General in the appropriate area a convenience time, date, and place, for making the survey.

3.2.2 The applicant shall carry out the flight test, together with such other ground and flight tests as may be required by the Director-General, in respect of the particular radio installation.

3.3 Radio Flight Test Report

On the satisfactory completion of the survey and the ground and flight tests, a Radio Flight Test Report shall be forwarded to the Director-General. The Radio Flight Test Report shall include information under the following headings, together with such additional information as is required by the Director-General in a particular case:
(a) Type and registration marks of aircraft.
(b) Type of installation.
(c) Modification reference number.
(d) Date and time of test.
(e) Position and height of the aircraft and details of the radio tests, including particulars of aerials and transmitter(s) used.

Note: The applicant may use CAD Form DCA 271 for the purpose.

3.4 **Radio Flight Test Certificate**

A certificate in the following form shall be signed by the pilot, or radio operator, as appropriate, at the conclusion of the flight tests:

I hereby certify that, with the exceptions stated below, the radio installation in the above designated aircraft has been proved to perform satisfactorily in flight the functions for which it is approved.

Exceptions ................................................................ Signed ........................................

........................................... Date ........................................

Note: The applicant may use CAD Form DCA 271 for the purpose.

3.5 **Notification of Approval**

The Director-General will issue an 'Approval of Aircraft Radio Installation' (CAD Form DCA 141) to signify approval of the radio installation.

4 **MODIFICATIONS TO AIRCRAFT RADIO INSTALLATIONS**

4.1 Application for approval of a modification to an aircraft radio installation shall be made in accordance with the Major Modification procedures in HKAR-1 Sub-section 1.2-5.

4.2 The applicant shall ensure that the design of the modification complies with:

(a) The Requirements in force at the time the application for the Major
Modification is received by the Director-General.

(b) Such other requirements as the Director-General may notify, in writing, for a particular modification.

4.3 When a change is made to a component which has already been the subject of a mandatory modification and this produces a new or modified component which achieves all the objectives of the previous mandatory modification, then the latter modification becomes an acceptable alternative to the previous one, and shall be shown in the Company’s modification system and associated documentation.

5 CHANGE OF OWNERSHIP

5.1 A change of aircraft ownership invalidates the radio licence; the new owner shall apply to the Office of the Telecommunications Authority for a new licence.
Section 1.4

Design and Manufacture of Products other than Aircraft
SECTION 1.4  
SUB-SECTION 1.4-2  

TYPE VALIDATION/ACCEPTANCE OF ENGINES AND ASSOCIATED EQUIPMENT  

1  GENERAL  The requirements of this paragraph 1 are, except where otherwise indicated, applicable to all engines and associated equipment first type certificated by an Authority other than Hong Kong. Approval of engines and associated equipment is by means of validation/acceptance of the certification issued by the Responsible Authority of the State of Construction.  

NOTE: No separate validation/acceptance is necessary in respect of engines and associated equipment which have been approved by JAA / UKCAA according to JAR-21 / BCAR Section A/B. The JAR-21 / BCAR Section A/B are recognised by the Director as an acceptable basis for showing compliance with the Hong Kong airworthiness codes. The JAA / UKCAA Type Approvals constitute the basis for the issue of approvals required by the current Air Navigation (Hong Kong) Order.  

1.1 Introduction. Engines and associated equipment for use in civil aircraft for which a Certificate of Airworthiness is required must be of approved types. The approval of such engines and equipment will be subject to compliance with the procedures set out in this Sub-section 1.4-2.  

NOTE: In respect of engines and associated equipment for use in civil aircraft, for which a Certificate of Airworthiness is required in the Special Category, the Director may accept proposals which would vary the procedures in this Sub-section 1.4-2.  

1.1.1 The procedures of this Sub-section also apply, in principle, to the approval of Auxiliary Power Units, except that, where appropriate, references to JAR-E should be read as being to JAR-APU.  

1.2 Definition of Engine. An engine used, or intended to be used, for aircraft propulsion. It consists of, at least, those components and equipment necessary for satisfactory functioning and control, but excludes the propeller and its associated equipment.  

1.3 Application. The application for an approval of an engine shall be made in accordance with paragraph 2.  

1.4 Engine Type Identity. All engines of the same basic type shall have a common designation, and variants thereof shall be identified in a manner acceptable to the Director, and all such details shall be listed on the Engine
Type Certificate, or equivalent approval documents. The designation shall differ from that of any similar engine designed and built to requirements other than JAR-E.

1.4.1 If the ratings of the engine are changed significantly after the engine has been approved, or a significant alteration to the physical standard is made, the identification shall be changed and the approval documents shall be amended accordingly.

1.5 **Modular Engines.** Details shall be provided in the relevant engine manuals of the division of the engine into modules (see JAR-1 for definition) giving the nomenclature and clearly defining the boundaries for each module.

2 **APPLICATION FOR APPROVAL**

2.1 Application for the approval of an engine shall be made in writing to the CAD Airworthiness Office.

2.2 The application shall be made through, or with the knowledge of, the Responsible Authority of the State of construction.

2.3 The applicant is responsible for the provision of the information specified in paragraph 3 and such other information as may be required by the Director.

2.4 The application shall include an undertaking to meet the costs incurred by the Director during its investigations resulting in validation/acceptance, the rejection of the application, or until the application is withdrawn.

2.5 The application shall also include an undertaking that the costs incurred by the Director for work in maintaining the validity of the Type Certificate will be met by the applicant.

3 **TYPE APPROVAL OF ENGINES**

3.1 In addition to compliance with paragraph 1, the application shall comply with this paragraph 3.

NOTE: No separate validation/acceptance is necessary in respect of piston engines of conventional design not exceeding 260 kW (350 BHP) installed in an aeroplane or helicopter the Maximum Total Weight Authorised of which does not exceed 2730 kg, for which an application for aircraft certification of no higher status than that granted by the Responsible Authority has been made to the Director.
3.2 In seeking validation/acceptance of approval, the applicant shall follow the procedures laid down in (a) to (d):-

(a) A comparison will be made between the requirements to which the engine has been approved and the equivalent Hong Kong airworthiness requirements.

(b) Any differences resulting from the comparison will be evaluated by the Director, and 'Additional Requirements' may be prescribed by the Director in writing.

(c) Sufficient information shall be supplied to the Director so that any novel or unusual design features which are not covered by the current Hong Kong airworthiness requirements may be identified. If, as a result of this consideration, it is necessary to prescribe further requirements, these will be notified in writing as 'Special Conditions'.

(d) The Responsible Authority shall accept responsibility for establishing that compliance is shown with any Additional Requirements and Special Conditions and for notifying the Director accordingly.

3.3 In addition to compliance with 3.2, the applicant shall comply with 3.3.1 to 3.3.3.

3.3.1 All documents required by the Director for validation/acceptance of approval of engines, and for their continued airworthiness, shall be provided in the English language, unless otherwise agreed by the Director.

3.3.2 For the purpose of the investigation, and unless otherwise agreed in writing, the following information shall be provided.

(a) A brief description of the engine and one copy of cross-section assembly drawings.

(b) (i) One copy of the type approval documents detailing all the relevant ratings, operating limitations, etc.

(ii) Where specifically requested, a copy of the requirements to which the engine was approved.

(iii) Details of any deviation from, or failure to comply
with, any other requirements, and of any Special Conditions which have been imposed by the Responsible Authority.

(iv) Where the certification documents do not provide a clear statement of the minimum acceptance power and/or thrust of a new, or newly overhauled engine, a statement of this information, together with the conditions under which the power and/or thrust should be achieved.

(c) One copy of a report summarising the development history and service experience, including a statement of any novel or unusual design features.

(d) One copy of the Type Certification Compliance Table or equivalent documents which includes details of any Special Conditions/Additional Requirements imposed by the Responsible Authority.

3.3.3 The following shall also be provided for retention by the Director:-

(a) One copy of each manual referred to in 6.1.

(b) One copy of all relevant Service bulletins, Modification Bulletins, etc., issued by the constructor, and mandatory instructions issued, or applied, by the Responsible Authority.

(c) Written confirmation that arrangements are in force to ensure that subsequent issues and/or amendments to the documents referred to in (a), (b) and (c) will continue to be supplied until the arrangements are terminated in writing by the Director.

(d) One specimen copy of the release documents, in which the Category of Release will be specified, which will be issued by the constructor, or the Responsible Authority, both for complete units and for spare parts.

(e) (i) A statement of the recommended initial overhaul period (or details of the equivalent maintenance programme) together with details of any associated inspections, checks, etc.
(ii) A list of all component retirement or ultimate (scrap) life limitations agreed by the Responsible Authority.

3.4 The constructor and the Responsible Authority will be informed where it is considered necessary for the constructor's Organisation to be approved by the Director. Where such approval is not necessary all data provided in accordance with 3.3 shall contain an indication that it is acceptable to the Responsible Authority.

3.5 When satisfied that compliance has been shown with all requirements the Director will validate/accept the approval given by the Responsible Authority and notify the applicant and Responsible Authority in writing. The acceptance documents will state any additional limitations which will apply when the engine is installed in an aircraft registered in Hong Kong.

4 DESIGN AND CONSTRUCTION

4.1 Engines and equipment shall have been designed, constructed and tested under airworthiness procedures acceptable to the Director.

4.2 Modifications. Modifications shall be approved in accordance with 4.2.2 or 4.2.3 or 4.2.4 to ensure that the proposed modification is such that the engine or equipment when modified complies with (a) and (b).

(a) The relevant design and test requirements as the Director may have notified in writing to the applicant, as being applicable to the engine, or items of equipment concerned.

(b) Such other design and test requirements as the Director may have notified in writing to the applicant, as being applicable to the engine, or items of equipment concerned.

4.2.1 Salvage/Repair schemes shall be classified as modifications, and shall normally be approved through the medium of the original Approval Organisation, or through an Organisation specifically approved for the purpose by the Director.

4.2.2 Manufacturers modifications shall be approved in accordance with the Certificating Authority's procedures. Additional investigation will not normally be undertaken by the Director, unless notified that the modification does not satisfy 4.2(a) or (b).

4.2.3 Modifications by other than the manufacturers, but under the control
of the Certificating Authority will be acceptable in accordance with 4.2.2.

5 ENGINE EQUIPMENT  Engine equipment which is intended for use on Hong Kong registered aircraft shall be approved or accepted in accordance with 5.1 or 5.2 as appropriate (see 1 Note).

5.1 **Group 1 Equipment.** For approval as an integral part of the engine, all Group 1 equipment shall comply with the design and test requirements of JAR-E and with (a) or (b), as appropriate.

(a) Items of Group 1 equipment for which the engine constructor takes full responsibility (Group 1(a)), shall have been designed and constructed in accordance with the airworthiness design and test requirements of the relevant specification.

(b) Items of Group 1 equipment for which the engine constructor does not accept the responsibility for full technical control (Group 1(b)), shall have been approved initially in accordance with a procedure similar to the Accessory Procedure of Sub-section 1.4-8, and shall be accepted by the engine constructor on the basis of the related Declaration of Design and Performance or equivalent document.

5.2 **Group 2 Equipment.** Group 2 equipment will be accepted for use on an engine subject to:-

(a) The design meeting the interface requirements specified by the engine constructor, or otherwise acceptable to the Director. Conformity with the interface requirements shall be certified by an Organisation appropriately approved by the Director.

(b) Evidence of satisfactory operation of the engine fitted with the equipment during tests acceptable to the Director.

**NOTE:** The procedure for the Approval of Group 2 equipment in its own right will be in accordance with Sub-section 1.4-8.

6 MANUAL

6.1 Approved manuals shall be provided containing instructions for installing, operating, maintaining and overhauling the engine and its associated equipment (see Sub-section 1.6-2 and 1.6-7).

6.2 Engine performance data, compatible with the engine acceptance and
operating limitations, shall be provided for aircraft certification performance, handling and stressing purposes. The data should be such that the power/thrust of a 'minimum' and a 'maximum' engine can be derived and shall include means of determining the effects on performance of variations of engine bleed and power off-take, forward speed, ambient pressure, temperature, humidity.

7 VARIATION OR CANCELLATION

7.1 At suitable times the Director will review with the respective design organisation and Responsible Authority the engines and associated equipment which have been approved to determine whether the approvals are still required or justified, or whether a variation is necessary. On the basis of their review the Director will make such changes or cancellations as may be appropriate to the circumstances.
APPENDIX NO. 1 TO SUB-SECTION 1.4-2

ENGINES AND ASSOCIATED EQUIPMENT

1 This Appendix contains supplementary information for guidance in complying with the requirements of Sub-section 1.4-2.

2 ENGINE IDENTITY (see Sub-section 1.4-2, 1.4). An engine type is defined for certification purposes by a designation given by the constructor, and for each variant an identification. The physical details are defined in a Drawing Introduction Sheet (DIS) or equivalent which is a list of all components and equipment.

3 ENGINE DRAWING INTRODUCTION SHEET (see Sub-section 1.4-2, 4.1)

3.1 The DIS is divided into the following list of items:-

(a) **Group 1.** This is a list of components and equipment which constitute the engine type as agreed in accordance with Sub-section 1.4-2, 4.1. The equipment in Group 1 may be sub-divided as follows:-

(i) **Group 1(a) Equipment.** Equipment for which the full technical control is the responsibility of the engine constructor’s Approved Organisation to the same extent as an engine component and therefore not separately identified in the approval documentation. The engine constructor is responsible to the Director for all airworthiness aspects of the equipment including the provision of the manuals. The engine constructor satisfies the Director that the technical competence and control procedures utilised are adequate for the purpose.

(ii) **Group 1(b) Equipment.** Equipment partly controlled by the engine constructor’s Approved Organisation and partly by the equipment manufacturer’s Approved Organisation.

(b) **Group 2.** This is a list of all aircraft service equipment which the Director agrees may be driven by the engine, or fitted to it, without hazard to the engine. The engine constructor’s responsibility for this equipment may be limited to a statement of interface
requirements.

3.2 If the definition of Group 1 in Sub-section 1.4-2, 4.1 were interpreted literally, many aircraft items would be included, e.g. to start an engine an electric battery is usually required, and to control the engine a throttle lever and linkage is necessary. It is, therefore, accepted that the engine designer's complete responsibility is limited and that the position of this limit will, to some extent, be arbitrary. To assist in this demarcation, the following guidance is given:-

(a) Parts, failure of which could cause direct damage to the engine (e.g. disintegration of a glow plug or an igniter plug), should be included in Group 1.

(b) Any part, which has a mechanical drive connection with the engine and is necessary for the satisfactory functioning and control of the engine should be included in Group 1.

(c) Group 1 need not include any items required to provide non-mechanical inputs to the engine if the nature of the input can be completely described. Thus, if the voltage, timing, current, etc., for a starter or igniter plug can be clearly specified, the items required to provide this electrical input need not be included. Similar considerations apply to inputs of fuel, air, etc.

(d) Any transmitter associated with the safe functioning of the engine should be included, but the indicator need not be included although its accuracy should be specified.

4 EQUIPMENT APPROVAL PROCEDURE (see Sub-section 1.4-2, 4.2)

4.1 At the time of application for approval of an engine the engine constructor should divide the equipment into Groups 1 and 2 as described in 3.1(a) and (b) and present the lists to the Director for agreement or appropriate revision. The following approval procedures then apply:-

(a) **Group 1(a) Equipment.** Compliance with the relevant requirement, agreed by the Director, is the responsibility of the engine constructor. The requirements are specified in the engine constructor's equipment specification. Acceptance of the equipment is the responsibility of the engine constructor but items of significance to airworthiness will be evaluated by the Director. Approval is awarded as an integral
part of the investigation into the engine design, and in these cases a Declaration of Design and Performance (DDP) is not required.

(b) **Group 1(b) Equipment.** A DDP is provided to identify the equipment manufacturer's share of the design responsibility. Compliance with the relevant requirements, agreed by the Director, for equipment in this group, is the responsibility of the equipment manufacturer within the limits given in the equipment DDP. For other conditions relevant to airworthiness not covered by the DDP the engine constructor is responsible. Where agreed, the acceptance of the DDP will be the responsibility of the engine constructor; otherwise the equipment approval will be negotiated between the Director and the equipment constructor.

(c) **Group 2 Equipment.** The equipment in the Group is fitted to the engine, unless otherwise agreed by the Director, for the relevant parts of the engine Type Tests. It is included on the engine approval documents when compliance has been established with the interface requirements defined by the engine constructor or otherwise acceptable to Director. Certification of this equipment in its own right is separate from that of the basic engine. Acceptance by the Director of a DIS does not imply that any units listed in Group 2 have been approved, but only that they may be fitted to the engine without an adverse effect on the engine.
SECTION 1.4

SUB-SECTION 1.4-4

TYPE CERTIFICATION OR VALIDATION/ACCEPTANCE OF PROPELLERS

1GENERAL The requirements of this paragraph 1 are, except where otherwise indicated, applicable to all propellers and associated equipment.

NOTE: No separate validation/acceptance is necessary in respect of propellers and associated equipment which have been approved by JAA / UKCAA according to JAR-21 / BCAR Section A/B. The JAR-21 / BCAR Section A/B are recognised by the Director as an acceptable basis for showing compliance with the Hong Kong airworthiness codes. The JAA / UKCAA Type Approvals constitute the basis for the issue of approvals required by the current Air Navigation (Hong Kong) Order.

1.1 Introduction. Propellers and associated equipment for use in civil aircraft for which a Certificate of Airworthiness is required must be of approved types. The approval of such propellers and equipment will be subject to compliance with the procedures set out in this Sub-section 1.4-4.

NOTE: In respect of propellers and associated equipment for use in civil aircraft for which a Certificate of Airworthiness is required in the Special Category, particularly amateur-built and ultra-light aircraft, the Director may accept proposals which would vary the procedures in this Sub-section 1.4-4.

1.2 Application. Application for an approval of a propeller shall be made in writing to the Director, and shall be accompanied by a declaration giving details of the propeller design together with details of the engine or engine/aircraft combination for which approval is sought. The applicant shall include an undertaking to meet the costs incurred by the Director during its investigation resulting in propeller approval, the rejection of the application after investigation, or until the application is withdrawn, and also subsequent work in maintaining the validity of the approval through modifications to the propeller type and/or amendments to the Type Approval.

NOTE: Propellers are finally approved in association with a defined engine/aircraft application. However, if requested by the applicant the Director will be prepared to indicate Preliminary Approval when compliance has been established with those requirements which can be met prior to the propeller being selected for, and fitted to, a particular aircraft, i.e. those requirements applicable to a propeller/engine combination only.

1.3 Propeller Type Identity. All propellers of the same basic type shall have
a common designation, and variants therefore shall be identified in a manner acceptable to the Director.

1.3.1 If the rating(s) of the engine and/or the flight envelope of the aircraft to which the propeller approval relates are changed significantly after the propeller has received Preliminary or Final approval, or a significant alternation to the physical standard of any feature of the installation is made, the approval will be reviewed, and if necessary, the identifications shall be changed.

2 COMPLIANCE

2.1 A propeller of a type not previously approved by the Director, but which has been approved by the Responsible Authority of the State of Construction (hereinafter referred to as the 'Responsible Authority') may have such approval validated/accepted subject to compliance with the procedures of this paragraph.

NOTE: No separate validation/acceptance is necessary in respect of propellers of conventional design fitted to piston engines not exceeding 260 kW (350 BHP) installed in an aeroplane the Maximum Total Weight Authorised of which does not exceed 2730 kg, for which an application for aircraft certification of no higher status than that granted by the Responsible Authority has been made to the Director.

2.1.1 The application for acceptance of approval of a propeller shall be in accordance with 1.2.

2.1.2 Propellers shall have been designed, constructed and tested under airworthiness procedures acceptable to the Director.

2.2 In seeking validation/acceptance of approval, the applicant shall follow the procedures laid down in (a) to (c):

(a) On the basis of a comparison made between the requirements to which the propeller has been approved and relevant Hong Kong requirement, 'Additional Requirements' may be prescribed by the Director in writing.

(b) Sufficient information shall be supplied to the Director so that any novel or unusual design features which are not covered by the current Hong Kong requirements may be identified. If, as a result of this consideration, it is necessary to prescribe further requirements, these
will be notified in writing as 'Special Conditions'.

(c) The Responsible Authority will accept responsibility for establishing that compliance is shown with any Additional Requirements and Special Conditions and for notifying the Director accordingly.

2.3 Once the requirements of 2.2 have been met, the applicant shall comply with 2.3.1 to 2.3.3.

2.3.1 All documents required by the Director for validation/acceptance of approval of propellers, and for their continued airworthiness, shall be provided in the English language, unless otherwise agreed by the Director.

2.3.2 For the purpose of the investigation, and unless otherwise agreed in writing, the following information shall be provided:-

(a) A brief description of the propeller and one copy of cross-section assembly drawings.

(b) (i) One copy of the design specification detailing all the relevant limitations, etc.

(ii) Where specifically requested, a copy of the requirements to which the propeller was approved.

(c) One copy of a report summarising the development history and service experience, including a statement of any novel or unusual design features.

(d) One copy of the Type Certificate Compliance Table or equivalent document which includes details of any Special Conditions imposed by the Responsible Authority.

2.3.3 The following shall also be provided for retention by the Director:-

(a) One copy of each manual referred to in 3.

(b) One copy of all relevant Service Bulletins, Modification Bulletins, etc., issued by the constructor, and mandatory instructions issued, or applied, by the Responsible Authority.
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(c) Written confirmation that arrangements are in force to ensure that subsequent issues and/or amendments to the documents referred to in (a) and (b) will continue to be supplied until the arrangements are terminated in writing by the Director.

(d) One specimen copy of the release documents, in which the Category of Release will be specified, which will be issued by the constructor, or the Responsible Authority, both for complete units and for spare parts.

(e) (i) A statement of the recommended initial overhaul period (or details of the equivalent maintenance programme) together with details of any associated inspections, checks, etc.

(ii) A list of all component retirement or ultimate (scrap) life limitations agreed by the Responsible Authority.

2.4 The constructor and the Responsible Authority will be informed where it is considered necessary for the constructor’s Organisation to be approved by the Director. Where such approval is not necessary all data provided in accordance with 3 shall be acceptable to the Responsible Authority, and shall contain an indication that it is so.

2.5 When satisfied that compliance has been shown with all requirements the Director will validate/accept the approval given by the Responsible Authority, and will state any additional limitations which will apply when the propeller is installed in an aircraft registered in Hong Kong.

3 MANUAls Approved Manuals shall be provided containing instructions for installing, operating, maintaining and overhauling the propeller and its associated equipment (see Sub-section 1.5-3 and 1.7-4).

4 ASSOCIATED PROPELLER EQUIPMENT Propeller equipment shall be approved in accordance with 2.2, taking into account any existing approval of the equipment by the Responsible Authority (see 1 Note).
SECTION 1.4

SUB-SECTION 1.4-8

DESIGN APPROVAL OF AIRCRAFT EQUIPMENT AND ACCESSORIES

1 GENERAL

1.1 Introduction. This Sub-section 1.4-8 sets out procedures whereby aircraft equipment and accessories may be registered and certified as suitable for installation in aircraft for which a Hong Kong Certificate of Airworthiness is desired.

NOTE: No separate investigation is necessary in respect of aircraft equipment and accessories which have been approved by JAA / UKCAA according to JAR-21 / BCAR Section A/B. The JAR-21 / BCAR Section A/B are recognised by the Director as an acceptable basis for showing compliance with the Hong Kong airworthiness codes. The JAA / UKCAA Type Approvals constitute the basis for the issue of approvals required by the current Air Navigation (Hong Kong) Order.

1.2 Applicability. The requirements and procedures set out in this Sub-section are applicable to:-

(a) All aircraft equipment and accessories intended for installation in aircraft, excluding:-

(i) Engines, Auxiliary Power Units, propellers and radio apparatus (see Sub-section 1.4-2, 1.4-4 and 1.4-10 respectively).

(ii) Items wholly designed by an aircraft constructor, where such items are intended to be installed only in that aircraft constructor’s own specific aircraft design, in which case they will be covered by the aircraft type record. (See Sub-section 1.3-2).

NOTE: Such items could include standard parts or components (e.g. electronic components).

(b) The approval or registration, as appropriate, of items, which are required to be approved.
(c) The acceptance and certification of items, which are not required to be approved.

(d) The installation of items into aircraft registered in Hong Kong.

2 DEFINITIONS

For the purposes of this Sub-section 1.4-8 the following definitions shall apply.

NOTE: To provide for the differences in regulatory procedures and terminology which exist between Hong Kong and certain countries, and in order to be consistent with the terminology, the following terms should be taken as having identical meanings:

(a) 'Item', 'Equipment', 'Appliance'.
(b) 'Certification', 'Appliance Registration'.

2.1 Items. Airframe parts and equipment intended to be installed in aircraft (excluding engines, propellers and radio apparatus).

2.1.1 Component. An item for which the procedure followed is that prescribed in 5.3.

2.1.2 Accessory. An item for which the procedure followed is that prescribed in 5.4.

2.2 Uncontrolled Items. Those airframe parts and equipment, the installation or failure of which would not adversely affect the airworthiness and the safe operation of an aircraft and as such are not required to be approved together with those items specifically exempted from approval by the Air Navigation (Hong Kong) Order.

2.3 Controlled Items. Those airframe parts and equipment:

(a) prescribed in the Air Navigation (Hong Kong) Order and not specifically exempted from approval;

(b) prescribed in the Requirements;

(c) on which the airworthiness and safe operation of an aircraft depend;

(d) the installation or failure of which could adversely affect the airworthiness and safe operation of an aircraft.
2.4 **Responsible Authority.** The body in any country which exercises control in a similar manner to Hong Kong in respect of regulatory procedures and airworthiness control of the item under consideration.

3 **STANDARD PARTS**

3.1 The procedure prescribed in this Sub-section 1.4-8 need not be followed for AGS and other standard parts complying with national or international specifications or standards recognised by the Director or the appropriate Responsible Authority.

NOTE: This is intended to cover minor items complying with AGS, SBAC, BSI or similar standards, where these are limited to manufacturing drawings from which the Organisation can assess the Items as suitable for the intended application.

3.2 The Organisation using such standard parts shall accept responsibility for the manner of their use.

4 **UNCONTROLLED ITEMS** Uncontrolled items, regardless of the country of manufacture are not required to be approved, but when installed in an aircraft registered in Hong Kong compliance shall be shown with the requirements of this paragraph 4.

NOTE: An Organisation responsible for the installation of Uncontrolled Items in aircraft may require these Items to be manufactured under the supervision of an appropriately approved Organisation.

4.1 **General**

4.1.1 An Organisation, responsible to the Responsible Authority in the country of origin, shall submit to the Director for acceptance, a certificate that it has satisfied itself that no Uncontrolled Items installed in the aircraft will, in themselves, constitute a danger to the aircraft, together with a list of the Items (except for those which obviously could have no safety significance). When so requested, the Organisation shall supply to the Director a summary of evidence on which the certification was based.

4.1.2 An Organisation approved for design incorporating Uncontrolled Items in an aircraft, shall submit to the Director for acceptance a certificate that it has satisfied itself that the installation of such Items does not adversely affect the airworthiness and safe operation of the
aircraft concerned, and that they are so installed that in the event of
their failure or malfunction the Items will not endanger the aircraft or
its occupants.

NOTE: For new aircraft types the certifications in 4.1.1 and 4.1.2 are covered by
the usual Certificate of Design for the aircraft type. When items are
introduced as modifications, the Director may require a further Certificate
of Design. (See Sub-section 1.6-6.)

5 CONTROlLED ITEMS - DESIGNED AND MANUFACTURED UNDER THE
SUPERVISION OF ORGANISATIONS LOCATED OUTSIDE HONG KONG
AND NOT APPROVED BY THE DIRECTOR BUT RESPONSIBLE TO THE
RESPONSIBLE AUTHORITY The procedures of this paragraph 5 are
applicable only to Items which have been designed, tested, manufactured,
documented and certificated in accordance with the relevant airworthiness
requirements, applicable specifications and procedures of the country of origin,
under the supervision of Organisations not approved by the Director but responsible
to the Responsible Authority.

5.1 Continuity of Quality. Assurance of continuity of quality may be
provided by evidence that procedures acceptable to the Responsible
Authority were used. Where continuity of quality is not so assured, such
inspections and tests as are considered necessary shall be made under the
supervision of an Organisation approved by the Director, to the satisfaction
of the Director.

5.2 Procedure to be Adopted. Where equipment is intended for use in
Hong Kong registered aircraft, the procedure to be followed for acceptance
or registration shall be the Component Procedure prescribed in 5.3 or the
Appliance Registration Procedure prescribed in 5.4, as determined by 5.2.1
to 5.2.4.

5.2.1 Where the Item is designed for a particular use in a particular aircraft
type, the Component Procedure shall normally apply. Where it is
proposed that the Appliance Registration Procedure should be used
for such an Item, the prior agreement of the Director shall be sought.

5.2.2 Where the Item is classified as Mandatory Equipment as defined in
the Air Navigation (Hong Kong) Order or in the appropriate Section
of the Requirements, the Appliance Registration Procedure shall
apply, unless agreed otherwise by the Director.

5.2.3 Where the Item is designed for general use other than as described in
5.2.1 or 5.2.2, either the Appliance Registration Procedure or the
Component Procedure shall be applied at the discretion of the
5.2.4 Where the Responsible Authority is unable or unwilling to operate the Appliance Registration Procedure, the Component Procedure shall apply.

5.3 Component Procedure

5.3.1 Where the Component Procedure is applied, the Director will not normally be involved in the investigation of the component. The Director does, however, reserve the right to carry out such investigations as it considers necessary in particular case. In the event of the Director becoming involved, the Organisation making use of the component will be advised. Any costs incurred by the Director in the investigation will be charged to that Organisation, unless other specific arrangements have been agreed between the Organisation(s) concerned and the Director.

5.3.2 The Organisation approved by the Director which is accepting responsibility for the installation of components produce in accordance with this paragraph 5 into products or aircraft of its own design, shall follow procedures equivalent to those specified in Sub-section 1.4-8. In addition, this approved Organisation shall establish to its own satisfaction and to the satisfaction of the Director, the adequacy of the control of the continued design, manufacture, modification and quality assurance procedures applicable to the component.

5.4 Appliance Registration Procedures

5.4.1 Application. Where the Appliance Registration Procedure is applied, the Applicant shall complete CAD Form DCA 70, and shall forward it to the CAD Airworthiness Office. The Director will charge to the Applicant all cost involved in the investigation of the Appliance, including fees, subsistence and travelling where appropriate. The total charge will be based on the cost of the investigation (regardless of the outcome) and the Director will, during the course, or upon completion of the investigation, notify the charges in writing. The Applicant shall, normally, deal direct with the Director throughout the Registration process.

5.4.2 General. The Appliance shall conform to a Specification (frequently the maker’s own specification or a specification issued by
the Responsible Authority) acceptable to the Director, and shall be certificated by a DDP (see 6) by an Organisation accepted by the Responsible Authority for the design of such Appliances. The Director will accept that an Appliance has those characteristics set out in the DDP and vouched for by the Responsible Authority. The Director shall have the right to disclose the contents of a DDP relating to the Appliance to persons interested in the installation of such an Appliance. The manufacturer of the Appliance is normally expected to make the DDP available to such persons.

5.4.3 **Procedure.** The procedure to be followed for the Appliance Registration shall be as set out in this paragraph 5.4.3.

(a) **Documentation.** The Applicant shall provide the following:-

(i) CAD Form DCA 70 and a letter requesting Registration addressed to the CAD Airworthiness Office.

(ii) Written confirmation from the Responsible Authority that it is willing to support the application for Appliance Registration.

(iii) A copy of the Specification(s) with which the Appliance complies.

(iv) Drawings and such descriptive information as will adequately define the Appliance to the Director.

NOTE: It may be necessary for the Director to require a physical examination of the item.

(v) A Declaration of Design and Performance (DDP) (see 6).

(vi) Type test or other evidence showing conformance with the Specification(s) with which the Appliance complies.

(vii) One copy of the Maintenance, Overhaul and Repair Manuals and a copy of Service Bulletins and the Installation Manual, where appropriate.
(viii) A Statement of Conformance signed by the Applicant certifying that:-

- The Appliance conforms to the Specification(s) and also complies with the appropriate requirements of the Responsible Authority. A statement of any agreed exceptions or deviations shall be made.

- The Appliance will be manufactured under the quality control procedures declared to, and accepted by the Responsible Authority.

- The Director will continue to be advised of any modifications affecting the airworthiness of the Appliance.

- A revision service for publications prescribed in (vii) will be provided.

(ix) Where the Appliance has been approved by the Responsible Authority, a copy of the original letter of approval.

(b) **Hong Kong Additional Requirements**

(i) After examination of the documentation required by (a), the Director may prescribe Additional Requirements.

(ii) Additional Requirements will be limited to the minimum found necessary:-

- to provide a level of safety equivalent to that provided for by Hong Kong Requirements, Specifications and practices, and to enable compliance to be shown with the Air Navigation (Hong Kong) Order.

- to cover unusual features not covered by existing Hong Kong Requirements, Specifications and practices.
(iii) In order to determine Additional Requirements the Director may require the Applicant to provide such failure analyses as are considered necessary.

(iv) Where Additional Requirements are prescribed, the Applicant and the Responsible Authority will be so advised and sent copies of all related correspondence. The Applicant shall then submit an amended Statement of Conformance, any additional evidence and a certificate that the Additional Requirements have been met. The Statement shall be accompanied by a letter from the Responsible Authority certifying that the design requirements for the particular Appliance, including the prescribed Additional Requirements, have been met.

(c) Registration

(i) Upon the acceptance of the documentation required by (a), and also, where applicable, receipt of satisfactory additional statements and evidence as required by (b)(iv), the Appliance will be registered by the Director as suitable for use within the limitations of the DDP and this Registration will be signified by issue of a CAD Appliance Registration reference 'AR' number. The Registration will apply only to the Applicant, at his address at the time of Registration.

(ii) The Director will provide the Responsible Authority with a copy of the formal letter of Registration of the Appliance.

(d) Acceptance of Individual Appliances

(i) Individual Appliances of a type registered in accordance with the procedure of this paragraph 5.4 shall be released to Hong Kong user under cover of an Airworthiness Approval Certificate issued by the Responsible Authority or by the Applicant, if authority has been delegated to him by the Responsible Authority and that Authority assumes full responsibility for the Certification. The Registration Number (AR) issued by the Director shall be quoted
on the Airworthiness Approval Certificate.

(ii) An Organisation with appropriate terms of approval for design may then incorporate the Appliance into products or aircraft of its own design, provided that the DDP shows the Appliance to be suitable.

6 DECLARATION OF DESIGN AND PERFORMANCE

6.1 A standard form of DDP for international use is given in ISO Recommendation No. R224 and a British version is given in BS 3G100: Part 1, entitled 'Declaration Identifications and Construction'. This will require to be adapted according to the nature of the Item. The Declaration shall contain at least the following information:-

(a) Particulars identifying the Item, its design standard, including reference to the specification(s) to which it is designed, and a record of drawings.

(b) The rated performance of the Item, either directly or by reference to other supplementary documents where necessary.

(c) The degree of compliance with the Requirements stating the issue number of the Section concerned.

(d) Reference to relevant test reports.

(e) Any limiting conditions applying to the use of the Item. This shall include limitations implicit in the design (e.g. working and ultimate pressure or loads, rating, working and maximum voltage and current, accuracy of instruments) declarations required by the governing specifications (e.g. by British Standard 3G100) and the ability of the Item to work under various environmental conditions (e.g. acceleration, vibration, altitude, temperature and humidity).

NOTE: For example, an item of electrical equipment may require the following information:-

(i) Voltage range.

(ii) Frequency range.

(iii) Time rating and duty cycle.
(iv) Altitude and temperature range appropriate to rating.

(v) Climatic test classification and waterproofness grade, as defined in BS 3G100, EUROCAE ED14A, or RTCA DO 160.

(vi) Vibration grading, acceleration class and grade, explosion-proofness category, fire resistance classification, compass safe distance and radio interference characteristics, all as defined in BS 3G100, EUROCAE ED14A or RTCA DO 160.

(vii) Minimum life or overhaul period in hours or cycles of operations.

(viii) Fluid resistance.

(ix) Any departures from the governing specifications.

6.2 The Declaration shall bear the following statement made and signed by an authorised signatory:-

I hereby certify that the information contained in this Declaration of Design and Performance is accurate and is made under the authority of the Director, Approval Ref: ....... . (Company Name) cannot accept responsibility for the satisfactory operation of Items used outside the conditions given above without their agreement.

7 MANUALS

7.1 In respect of Items of which the Accessory or Appliance Registration Procedure has been applied, the Applicant shall prepare the appropriate Maintenance, Overhaul and Repair Manuals as required by Sub-section 1.5-3.

7.2 In respect of Items to which the Component Procedure has been applied, the appropriate Organisation responsible to the Responsible Authority shall prepare the Maintenance, Overhaul and Repair Manuals, or such parts thereof as are appropriate, as required by Sub-section 1.5-3.

8 MODIFICATIONS

8.1 Modifications to Items to which the procedures of this Sub-section 1.4-8 have been applied may affect the original approval, registration or certification. The Applicant shall notify the Director or the user, as appropriate, of the intention to change or modify the design, or where a new
'Mark' is to be introduced. Where required by the Director, CAD Form DCA 70 shall be complete and forwarded to the Director.

NOTE: The procedures for approval of modifications to aircraft are prescribed in Sub-section 1.2-5.

8.2 Where modifications of Items to which the procedures of this Sub-section 1.4-8 have been applied affect physical or functional interchangeability, a separate type (or part) number shall be allocated to the modified Item. Less significant changes shall be identified in an acceptable manner.

8.3 Where the modification invalidates any of the information included in the Type Record for the Item or the Declaration of Design and Performance, the document(s) shall be re-issued with account taken of the modification.

8.4 The Applicant shall keep a master record of all modifications and this shall be made available to the Director on request.

9 MANDATORY MODIFICATIONS AND INSPECTIONS Modifications and inspections considered essential for airworthiness will be classified as mandatory by the Director in consultation with the approved Organisations concerned and the aircraft constructor, as appropriate, in accordance with the procedures of Sub-section 1.5-6.

10 EQUIPMENT REGISTER

10.1 The Applicant shall maintain a register of Items designed for use on aircraft. The register shall be in a form acceptable to the Director, and shall be made available to the Director on request.

10.2 Arrangements shall be made to keep the register up to date in respect of new or modified Items. An overall review of Items listed in the register shall be made at periods not exceeding three years, with a view to recommending to the Director cancellations of approval, registration or restriction of use of obsolete or obsolescent Items.

NOTE: The terms of approval in accordance with Sub-section 1.8 are such that essential records may not be destroyed without authorisation from the Director.
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SECTION 1.4

SUB-SECTION 1.4-10

RADIO APPARATUS

1 INTRODUCTION

The requirements and procedures prescribed in this Sub-section 1.4-10 are applicable to radio (and radar) apparatus, i.e. apparatus concerned with information transfer by the use of radiated electromagnetic waves.

NOTE: No separate investigation is necessary in respect of radio apparatus and associated equipment which have been approved by JAA / UKCAA according to JAR-21 / BCAR Section A/B. The JAR-21 / BCAR Section A/B are recognised by the Director as an acceptable basis for showing compliance with the Hong Kong airworthiness codes. The JAA JTSO Authorisations / UKCAA Type Approvals constitute the basis for the issue of approvals required by the current Air Navigation (Hong Kong) Order (see Appendix No. 1 of this Sub-section).

2 DEFINITION

Radio Apparatus is defined as a discrete radio appliance which can readily be connected into, and removed from, an aircraft radio system.

NOTE: The term radio apparatus is intended to include such associated devices as aerials, transducers, service selection systems, radio navigational computers, display systems and power supply units concerned with the radio installation.

3 PROTOTYPE APPARATUS

3.1 The acceptance of Radio Apparatus is based on examination of the design and quality in order to establish compliance with HKAR and with such other Hong Kong requirements as are applicable.

NOTE: The Director will consider an application for approval of apparatus for use in a restricted category, where the apparatus has not been approved by the competent authority in the country of manufacture.

3.2 Application for Approval. CAD From DCA 70, copies of which may be obtained from the CAD Airworthiness Office, shall be completed and returned, together with the data and information prescribed in 3.3. The fee is based on the cost investigation. The Director will upon completion of the investigation, notify the applicant in writing of any charges.

3.3 General. As a minimum to support the initial application for approval, the applicant shall provide the following:-
(a) Evidence that the apparatus is of a type approved by the competent authority of the country in which it was manufactured, together with a copy of the type approval test report for the apparatus.

(b) Evidence of the approval standard to which the apparatus has been certified, together with a DDP.

(c) A copy of manual covering Installation, Maintenance and Overhaul.

(d) A copy of the production test specification for the apparatus and evidence of the quality control procedures used in production.

(e) Information regarding procedures for notification of modifications, the availability of spare parts, and the servicing arrangements which could be made available in Hong Kong.

3.3.1 Should the information provided in accordance with 3.3 be insufficient to establish the acceptability of the apparatus, the Director shall have the right to make such further investigations, and to prescribe such further tests, as are necessary to establish whether or not compliance can be shown with the relevant requirements.

3.3.2 The Director may require additional information to that provided in accordance with 3.3, and the provision of such information shall be the responsibility of the applicant. In cases where the applicant is not the manufacturer or the designer of the apparatus, the Director reserves the right to consult the manufacturer, or the designer, directly on any matters concerning the approval of the apparatus.

3.3.3 It is preferable that the information provided for the Director is in English.

3.3.4 Where continuity of quality cannot be vouched for by a competent authority in the country in which the apparatus is manufactured, then such inspections and testing of series units as are necessary to establish quality shall be carried out by an appropriately approved Organisation.

3.3.5 The applicant shall ensure that the Director is informed of modifications of the apparatus.

4 SERIES APPARATUS
4.1 Series Radio Apparatus shall be certified by an appropriately Approved Organisation (see Sub-Section 1.8).

4.2 Each item of series Radio Apparatus shall be marked as follows:-

(a) Manufacturer's name.

(b) Manufacturer's type designation.

(c) Manufacturer's serial number.

(d) Modification state.

(e) Power supply characteristics.

(f) The compass safe distance when this exceeds 30 cm (12 in).

(g) To show any special requirements for installation, e.g. specific orientation.

5 DESIGN RECORDS All relevant design information, drawings and test reports shall be held at the disposal of the Director. No such design records shall be destroyed without authorisation from the Director.

5.1 Each design drawing shall bear a descriptive title, drawing number, issue number, and date of issue. All alterations to drawings shall be made in accordance with a drawing amendment system such as will ensure amendment to design records.

5.2 Immediately an alteration is made to a drawing, whether the alteration is permanent or temporary, the drawing shall be identified with a new issue number and date. Where an alteration affects the interchangeability of any item in any way, a new part number shall be issued such as to avoid confusion with the original item.

5.3 The Production Test Specifications shall constitute part of the design records.

6 OVERHAUL, REPAIR AND REPLACEMENT The procedures for overhaul, repair and replacement are given in Sub-section 1.6-7.

7 MODIFICATIONS Where modifications affect the performance or other airworthiness characteristics of an item, a CAD Form DCA 70 shall be completed
and returned as detailed in 3.1. A copy of the details of the modification shall be forwarded to the Director, preferably at an early stage in the design.

7.1 Where modifications are classified as mandatory by the Director, a date shall be agreed with the Director by which all affected apparatus is to be modified, that date to be quoted in the modification documents.

7.2 The DDP and the appropriate Manuals shall be amended where the modification affects the information in these documents.

NOTE: The general procedures for approval of modifications are prescribed in Sub-section 1.2-5.

8 INSPECTION OF APPARATUS Radio apparatus shall be made available to enable the Director to inspect it as necessary for the purpose of approval.
APPENDIX NO. 1 TO SUB-SECTION 1.4-10

HONG KONG STANDARD FOR APPROVAL OF AIRCRAFT RADIO APPARATUS

1 AIRCRAFT RADIO EQUIPMENT Aircraft Radio Equipment (CAP 208) is published by UKCAA. Volume 1 of CAP 208 contains minimum performance requirements designed to ensure that aircraft equipment certificated to them will be compatible with the relevant ICAO Standards. Volume 2 of CAP 208 lists all radio equipment approved by the UKCAA for use in UK registered civil aircraft and indicates, where appropriate, the purposes for which it may be used. Joint Technical Standard Order (JTSO) is issued by the Joint Aviation Authority and is a minimum performance standard for specified articles. Their status is that they are recognised by the Director as an acceptable basis for showing compliance with the Standard and constitute the basis of the issue of approvals as required by the Air Navigation (Hong Kong) Order. The requirements and procedures prescribed in Sub-section 1.4-10 are applicable to radio apparatus which does not hold an UKCAA approval or a JAA JTSO authorisation.
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Section 1.5

Continued Airworthiness – Responsibilities of the Type Design Organisation
INTRODUCTION

1.1 This Sub-section 1.5-2 gives guidance on the procedures of conducting a Maintenance Review Board (MRB) or Maintenance Type Board (MTB) for a new aircraft type or type variant, as part of the Instructions for Continued Airworthiness (ICA). The MRB Report or MTB Report contains the minimum set of tasks, developed under the Maintenance Steering Group (MSG) logic process where applicable, required for an aircraft’s maintenance schedule / programme.

PROCEDURES

2.1 The Director-General will inform the Type Design Organisation whether an MRB or MTB is to be established for a new aircraft type or type variant.

2.2 If an aircraft which has been subject to the MRB/MTB process is modified by a Supplementary Type Certificate (STC), the relevant systems, powerplant and structure must be reviewed to determine the maintenance requirements as part of the ICA, as a result of the modification.

2.3 The Director-General accepts the International MRB/MTB Process Standard (IMPS) document (Document No. IMPS), published by the International Maintenance Review Board Policy Board (IMRBPB), as the procedures for use in the MRB/MTB process.

2.4 The IMPS document can be located in the IMRBPB web site www.easa.europa.eu/easa-and-you/aircraft-products/international-maintenance-review-board-policy-board-IMRBPB.
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SECTION 1.5

SUB-SECTION 1.5-3

MAINTENANCE, OVERHAUL AND REPAIR MANUALS

1 INTRODUCTION

1.1 Manuals containing information and recommendations necessary for the maintenance, overhaul and repair of aircraft, including engines and auxiliary power units, propellers, components, accessories, instruments, electrical and radio apparatus and their associated systems, and radio station fixed fittings, shall be provided by the constructor/manufacturer/Type Design Organisation to comply with the procedures outlined in this Sub-section for aircraft to be granted a Hong Kong Certificate of Airworthiness.

1.2 All relevant manuals must be available, unless otherwise agreed by the Director-General, for issue to a standard of completion acceptable to the Director-General at the time of issue of the Certificate of Airworthiness.

2 GENERAL

2.1 Except as otherwise agreed by the Director-General, manuals, produced in accordance with this Sub-section, shall be certificated and published under the authority of the appropriate Type Design Organisation and shall accurately reflect the design and production standard of the item concerned (see 1.1).

2.1.1 The Director-General reserves the right to investigate the content of any certified manual and to require the embodiment of any revision or amendment which is considered necessary to satisfy the Requirements.

2.2 Engine, auxiliary power unit and propeller constructors and manufacturers of other components shall provide the aircraft Type Design Organisation with certified manuals which relate to those of their products installed in the aircraft. In the case of products approved under the Component Procedure in Sub-section 1.4-8 the certified manuals shall be provided by the manufacturer, or produced by the aircraft Type Design Organisation in collaboration with the manufacturer.

2.3 All manuals shall be adequately illustrated and include such instructions and information considered necessary to meet the requirements of this Sub-section. Manuals complying with the applicable recommendations in Sub-section 1.7-4 would fulfil the requirements or other methods would be acceptable with the agreement of the Director-General.
2.4 Manuals conforming with the Specification for Manufacturers' Technical Data - Air Transport Association of America - Specification No. 100, would also be acceptable as a basis for complying with this Sub-section, subject to the inclusion of any variations from the Specifications which may be required by the Director-General and which are defined to the applicant.

3 MANDATORY LIFE LIMITATIONS

3.1 The certification of aircraft, engines, propellers and auxiliary power units, often depends on safe lives being established for certain parts, failure of which could hazard the aircraft. They have previously been described in a number of ways; e.g. retirement, ultimate, or scrap lives, but are hereafter referred to as Mandatory Life Limitations.

3.2 There is no universal international convention for the location of an authoritative source of Mandatory Life Limitations in the aircraft publications. Because it is important for users of the equipment to be able positively to locate the information, the Director-General will make a statement in respect of each aircraft on Hong Kong register in an agreed document by incorporation of amendments or change sheets, giving a reference for each aircraft, engine, propeller and auxiliary power unit to the publications in accordance with 3.3, 3.4 and 3.5 in which this information is promulgated.

3.3 For new certifications the Mandatory Life Limitations required under 3.1 shall be located in accordance with 3.3.1 to 3.3.4 as applicable.

3.3.1 In the 'Airworthiness Limitations' section of the Maintenance Manual or other agreed document which forms part of the Instructions for Continued Airworthiness where such a document is required by the regulations under which certification is awarded.

3.3.2 Where an approved 'Airworthiness Limitations' section (or equivalent) does not exist, in agreed document(s)* which will be identified in accordance with 3.2.

3.3.3 Where the aircraft, or other product is of origin other than Hong Kong and the Director-General wishes to impose limitations which are in addition to, or different from, those approved by the certificating authority of the country of origin, then these changes shall be promulgated by:--

* In the case of engines, propellers and auxiliary power units it is recommended that these limitations are stated in either the Overhaul Manual or the Maintenance Manual (See Sub-section 1.7-4), with a suitable cross reference to the other. Additionally, the definition of a 'typical cycle' shall be stated in the Maintenance Manual and a cross reference included in the Overhaul Manual.
HKAR-1

(a) in the case of aircraft having an approved 'Airworthiness Limitations' section (or equivalent) in an agreed document by incorporation of amendments or change sheets which are approved by the Director-General;

(b) in the case of aircraft which do not have an approved 'Airworthiness Limitations' section (or equivalent), in an agreed document identified as in 3.2.

3.3.4 For any component for which a Mandatory Life Limitation has been established (engines, propellers, helicopter rotor head, airframe structure etc.) the definition of a 'typical cycle' or 'typical flight' (engine/propeller parameters, aircraft weight, forward speed, altitude, duration, etc.), in terms of the relevant parameters on which this life determination has been based, shall be stated in the document required under 3.3.1 or 3.3.2. The definition of a typical cycle of flight should be based on the best information (e.g. from development and certification flight testing) at the time of certification, and updated, as necessary, following service experience.

3.4 Where these Mandatory Life Limitations have been established in units other than flying hours or landings (e.g. cycles) and published in accordance with 3.1, 3.2 and 3.3, the procedure for converting flying hours or landings, as applicable, into these units shall be given in the same documents.

3.5 Whatever the source, each Mandatory Life Limitation must be approved by the Director-General or by the responsible Authority of the country of origin. No alteration or deletion shall be made to any of the published Mandatory Life Limitations without prior approval of the Director-General.

3.6 Where any alterations in the published Mandatory Life Limitations are required by the Director-General, these shall be promulgated as follows:-

3.6.1 Normal Amendments to Mandatory Lives

(a) In the case of aircraft or products having an approved 'Airworthiness Limitations' document, by incorporation of an amendment approved by the Director-General to that document.

(b) In the case of products which do not have an approved 'Airworthiness Limitations' section or equivalent, by means of an amendment to the documents specified in accordance with 3.3.3(b).
3.6.2 **Reductions in Mandatory Lives.**

Immediate attention must be drawn to any reduction in a Mandatory Life Limitation.

4 **REVIEW AND AMENDMENT OF MANUALS**

4.1 Certified manuals shall be reviewed by the originator and where changes have been made affecting maintenance, overhaul and repair, permanent revisions or amendments shall be published. A copy of each revision or amendment shall be forwarded to the Director-General.

4.2 Permanent revisions or amendments or temporary revisions or amendments shall be distributed by the Type Design Organisation or manufacturer to registered holders of the manuals, together with the necessary instructions for embodiment and recording in the manuals. Each manual shall contain a statement which will indicate that the changing of data by uncertified revisions or amendments or temporary revisions or amendments invalidates the initial certification of the manual relative to the part revised.

4.3 Operators with appropriate approval may amend manuals without reference to the Type Design Organisation, provided that the technical substance of the change is within the terms of their approval. In this case the operator shall proceed as follows:-

(a) Prepare a temporary or permanent revision or amendment in compliance with this Sub-section.

(b) Provide the Director-General with a copy.

(c) Incorporate the revision or amendment in the manuals and record the embodiment in a revision or amendment record, which is separate from that provided by the Type Design Organisation.

NOTE: Where operators wish to amend manuals, co-operation with the Type Design Organisation is recommended. This also applies where amendments to manuals are necessary due to the incorporation of Minor modifications under the CAD Form DCA 261 procedure (see Sub-section 1.2-5).

4.4 The registered holder will be responsible for making the necessary arrangements with Type Design Organisations or manufacturers to ensure receipt of revisions or amendments to manuals and any Service Bulletins, or similar documents that may be issued from time to time.
5 MAINTENANCE PROGRAMMES

5.1 The Type Design Organisation (see Sub-section 1.6-2), shall be responsible for:

(a) The compilation of a list of the Maintenance Significant Items from an evaluation of the functions, failure modes and failure effects of the engine/APU and related systems.

(b) Taking account of (a), the establishment of a list of maintenance actions together with recommended frequencies and sampling points.

(c) The establishment of a programme for monitoring engine critical parts (see JAR-E) at the prescribed intervals.

(d) The evaluation of the effect of the operator's flight profile on engine/APU rotating parts or the provision of information on which such evaluation can be based (see Airworthiness Notice No. 44).

(e) The preparation of a submission for the aircraft Type Design Organisation's Minimum Equipment List (MEL) and co-operation in subsequent changes (see Sub-section 1.7-6).

5.2 When establishing the list of maintenance actions with recommended frequencies which should be carried out on the engine and APU, the total evidence available should be assessed, account being taken of:

(a) The evaluation required by 5.1(a).

(b) Any similarity of the design to existing types.

(c) The experience already gained, either as a result of flight testing or from route proving under conditions reasonably similar to those which will exist in service, or from previous service experience.

(d) The experience gained during simulated flight plan testing (e.g. durability bench tests).

(e) The experience gained on components during engine and rig testing.

(f) The extent of the provisions made for Engine Health Monitoring, and

(g) the submitted Minimum Equipment List.
6 VITAL POINTS

6.1 Vital Point

Any point on an aircraft at which single mal-assembly could lead to catastrophe, i.e. result in loss of aircraft and/or in fatalities.

6.2 Certain parts in an aircraft's structure or system (including controls and control systems) which are vital to the safety of the aircraft, are not only designed to achieve the appropriate high integrity but are also dependent upon specified maintenance actions to safeguard their integrity throughout the life of the aircraft. For such parts normal inspection procedures and techniques may not provide verification with a sufficiently high degree of confidence, and it will be necessary for two independent (duplicate) inspections to be carried out after initial assembly, or re-assembly following disconnection or adjustment, in accordance with Sub-section 1.6-2.

6.3 For some aircraft, the vital points are identified and listed in the maintenance documents. For those aircraft where no such identification and listing of vital points has been provided, an operator with the necessary Design Approval or otherwise in consultation with a competent design organisation, may identify and list such points and apply to the Director-General to have the list incorporated in the aircraft maintenance documents. Provided such a list is accepted by the Director-General the operator need then carry out duplicate inspections following disturbance of the listed points only.

6.3.1 For rotorcraft, vital points shall be identified and the list shall be incorporated in the aircraft maintenance documents as described in 6.3.

6.3.2 For fixed wing aircraft, if no arrangement such as described in 6.3 has been agreed by the Director-General, the need for duplicate inspection of all control systems will remain.
SECTION 1.5

SUB-SECTION 1.5-4

WEIGHT AND BALANCE OF AIRCRAFT

1 INTRODUCTION

This Sub-section 1.5-4 prescribes the requirements for the weighing of aircraft, the determination of the corresponding centre-of-gravity position and the provision of information from which the loading for flight can be correctly determined.

NOTE: The operator's responsibilities are prescribed in the Air Navigation (Hong Kong) Order 1995.

2 DEFINITIONS

2.1 Basic Weight

Basic Weight is the weight of the aircraft and all its basic equipment, plus that of the declared quantity of unusable fuel and unusable oil. In the case of turbine-engined aircraft the Maximum Total Weight Authorised of which does not exceed 5700 kg, it may also include the weight of usable oil.

2.2 Basic Equipment

Basic Equipment is the unconsumable fluids, and the equipment which is common to all roles for which the operator intends to use the aircraft.

2.3 Variable Load

Variable Load is the weight of the crew, of items such as the crew's baggage, removable units, and other equipment the carriage of which depends upon the role for which the operator intends to use the aircraft for the particular flight.

2.4 Disposable Load

Disposable Load is the weight of all persons and items of load, including fuel and other consumable fluids, carried in the aircraft, other than the Basic Equipment and Variable Load.

NOTE: To obtain the total loaded weight it is necessary to add to the Basic Weight the weights of those Variable and Disposable Load items which are to be carried for the particular role for which the aircraft is to be used.
3 GENERAL

3.1 Aircraft shall be weighed when all manufacturing processes have been completed, and in accordance with the procedures in this paragraph 3.

NOTE: The Director-General will consider applications from aircraft constructors and operators to weigh certain types of aircraft on a sampling basis (i.e. representative aircraft, as weighed, would be acceptable for others of the same standard).

3.1.1 Aircraft the Maximum Total Weight Authorised of which exceeds 5700 kg shall be re-weighed within two years after the date the Certificate of Airworthiness is first issued in Hong Kong, and subsequent check weighing shall be made at intervals not exceeding five years, and at such times as the Director-General may require.

3.1.2 Aircraft the Maximum Total Weight Authorised of which does not exceed 5700 kg, shall be re-weighed at such times as the Director-General may require.

3.2 When an aircraft is weighed, the condition of the aircraft (i.e. the equipment and other items of load such as fluids in tanks) shall be recorded. The equipment installed should not differ from that included in the declared list of Basic Equipment associated with the Weight and Centre-of-Gravity Schedule or the Loading and Distribution Schedule as appropriate.

3.3 The Basic Weight and the corresponding C of G position shall be determined and entered in the Weight and Centre-of-Gravity Schedule or in the Loading and Distribution Schedule as appropriate.

3.4 The Director-General may require that the actual weight of the items of Variable Load be ascertained.

3.5 A Weighing Record containing records of the weighing and the calculations involved shall be made available to the Director-General, and such records shall be retained by the operator. When the aircraft is again weighed the previous Weighing Record shall be retained with the aircraft records.

4 WEIGHT AND BALANCE REPORT - AIRCRAFT EXCEEDING 5700 kg

4.1 A Weight and Balance Report shall be produced for each Prototype, Variant and Series aircraft the Maximum Total Weight Authorised of which exceeds 5700 kg.
Aircraft exceeding 2730 kg (see Sub-section 1.7-10 Appendix No. 1)

A Weight and Centre-of-Gravity Schedule shall be provided for each aircraft the Maximum Total Weight Authorised of which exceeds 2730 kg, except that for an aircraft the Maximum total Weight Authorised of which exceeds 5700 kg the information contained in Parts B and C of the Schedule may, for a new aircraft, be given as part of the Weight and Balance Report.

Aircraft not exceeding 2730 kg (see Sub-section 1.7-10 Appendix No. 2)

For aircraft the Maximum Total Weight Authorised of which does not exceed 2730 kg, either a Weight and Centre-of-Gravity Schedule which complies with paragraph 5 and shall contain instructions for the determination of the loaded weight, the total load moments and resultant c.g. positions, or Loading and Distribution Schedule which complies with Paragraph 3 of Sub-section 1.7-10 shall be provided.
SECTION 1.5

SUB-SECTION 1.5-6

MANDATORY MODIFICATIONS AND INSPECTIONS
PROCEDURE FOR CLASSIFICATIONS

INTRODUCTION

1.1 This Sub-section contains information concerning classification, notification and identification of mandatory modifications and inspections and of availability of associated publications. Mandatory inspections, for the purpose of the Sub-section 1.5-6 are those inspections classified as mandatory by the Director-General, where the inspection itself is the work.

1.2 The provisions of Article 8(7) of the Air Navigation (Hong Kong) Order 1995 are such that a Certificate of Airworthiness in respect of an aircraft registered in Hong Kong will cease to be in force until any modifications or inspection, being a modification or inspection required by the Chief Executive, is completed.

CLASSIFICATION

2.1 The following modifications and inspections are classified as mandatory:

(a) Those notified in an UKCAA Airworthiness Directive. These are normally notified initially by the product constructor/manufacturers documents* using an annotation in the following terms:

'This modification/inspection has been classified as mandatory by the Civil Aviation Authority'.

The allocated UKCAA Airworthiness Directive number may not appear in the constructor/manufacturers documents but will be quoted when it is published in the Mandatory Aircraft Modifications and Inspections Summary.

(*) Documents such as Service Bulletins, Technical News Sheets, etc. are used for this purpose.

(b) Those notified as mandatory in the UK Foreign Airworthiness Directives Volume I, II and III or equivalent notification issued by the Responsible Authority of the Country of Origin, unless notification by
the Director-General is made to the contrary.

(c) Those notified in an UKCAA Additional Airworthiness Directive.

(d) Those notified in an UKCAA Emergency Airworthiness Directive.

(e) Those notified as mandatory in a foreign Airworthiness Directive or equivalent notification issued by the Responsible Authority of the Country of Origin, unless notification by the Director-General is made to the contrary.

(f) Those necessary to comply with Hong Kong Airworthiness Notices of a mandatory character (e.g. Nos. 56, 79).

NOTES: (1) Sub-paragraphs 2.1(a), (d) and (f) are applicable to Products of UK Manufacture.

(2) Sub-paragraphs 2.1(b), (c), (d), (e) and (f) are applicable to Products of non-UK Manufacture.

2.2 Information on mandatory modifications and inspections applicable to UK manufactured products is summarised in the publication 'Mandatory Aircraft Modifications and Inspections Summary', published by the UKCAA.

2.3 Notification of mandatory modifications and inspections applicable to non-UK manufactured products (both Foreign Airworthiness Directives and UKCAA Additional Airworthiness Directives) is by issue of amendments to the three volumes of the publication 'Foreign Airworthiness Directives' published by the UKCAA. This publication deals separately with products of USA manufacture and those manufactured in non-UK countries other than the USA.

NOTES: (1) It is important that operators of non-UK constructed aircraft on the Hong Kong register arrange to receive copies of 'Foreign Airworthiness Directives' and use the latest issue so that any requirements additional to the previous issue can be complied with.

(2) Foreign Airworthiness Directives usually refer to constructor/manufacturer bulletins, etc., therefore owners, operators and organisations undertaking maintenance or overhaul of aircraft should ensure that their names and addresses are known to constructors of the aircraft for which they are responsible.

2.4 UKCAA Emergency Airworthiness Directives can be issued for both UK and non-UK constructed products. They are used to notify mandatory modifications and inspections where the degree of urgency is such that it is not practical to use the normal channels. UKCAA Emergency Airworthiness Directives are sent to relevant operators through the Hong Kong CAD
Airworthiness Office. Unless inappropriate (e.g. a single, immediate inspection) the normal publication action will be taken in due course.
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SECTION 1.5

SUB-SECTION 1.5-7

MASTER MINIMUM EQUIPMENT LISTS

1 INTRODUCTION

1.1 The Master Minimum Equipment List (MMEL) issued by the Type Certificate Holder is a document that lists the equipment which may be temporarily inoperative, subject to certain conditions, while maintaining an acceptable level of safety as intended in the applicable Hong Kong Aviation Requirements. Each MMEL is specific to an aircraft type.

1.2 Information and instructions intended to enable the determination of the measure of unserviceable equipment and systems which may exist at the commencement of a flight while still allowing the safe operation of the affected aircraft shall be provided in the MMEL for the type, for approval by the Director-General. Operators of aircraft of the appropriate type will use the information and instructions provided in the MMEL to produce their own Minimum Equipment List (MEL).

2 APPLICABILITY

2.1 This requirement is applicable to any aircraft for which a Certificate of Airworthiness (C of A) is in force or for which an application for issue of a C of A has been made, and which has a MTWA exceeding 2730 kg, with the exception of those certification in the Special Category, unless otherwise determined by the Director-General.

NOTE: The MMEL is not intended to be used as an operator’s MEL.

3 APPLICATION FOR APPROVAL OF A MMEL

3.1 Detailed requirements for the approval of MMEL are contained in CAD 549 HKAR-MMEL/MEL.
HKAR-1

3.2 For types or variants for which application is made to the Director-General for either the issue of a new Hong Kong Type Certificate or the extension of an existing Type Certificate, the provision of the approved MMEL may be considered to be an integral part of the Type Certification process. In such cases a separate application for approval of the MMEL will not be necessary.

3.3 An application for the approval of a MMEL which is submitted separately from an application for Type Certification (or the extension of an existing Type Certificate) will be considered to constitute a modification (see 4(b)).

4 CHARGES

The charges for the investigation and approval of a MMEL will be levied as follows:-

(a) For a type which is the subject of a Type Certification programme such charges will be included in the Type Certification charges.

(b) For a type for which application is made separately from that for Type Certification such charges will be in accordance with the Hong Kong Air Navigation (Fees) Regulations appropriate to modifications current at the time of application.

5 MODIFICATION OF AIRCRAFT

Applicants for approval of modifications to aircraft (HKAR-1 Sub-section 1.2-5) shall, at the time application is made, consider the effects of the proposed modification upon the information and instructions contained in the MMEL for the type and shall inform the Director-General of any revisions likely to be required as a consequence of the incorporation of the modification.
SECTION 1.5

SUB-SECTION 1.5-8

MANDATORY ACTION ON AIRCRAFT OPERATING IN ACCORDANCE WITH A PERMIT TO FLY

1 INTRODUCTION

1.1 This sub-section 1.5-8 prescribes the requirements and procedure for reporting, promulgating and implementing action declared as mandatory by the Director in respect of aircraft registered in Hong Kong and operating in accordance with a Permit to Fly.

1.2 The Permit to Fly for an aircraft registered in Hong Kong will cease to be in force if any required action, compliance end date or flying time limitations specified by the Manufacturers Alert Service Bulletin or UKCAA Mandatory Permit Directives (MPD) where applicable have not been complied with.

2 WORK AND CERTIFICATIONS

2.1 Work undertaken in incorporating a Mandatory Permit Directive or an Alert Service Bulletin shall be supervised by an Organisation approved by the Director for the purpose (see Section 1.8) or by a person appropriately authorised by the Director.

2.2 Full particulars of the work undertaken to incorporate the modification, or details results and work arising from the mandatory inspection, shall be entered in the appropriate log book, quoting the reference number of the appropriate document, e.g. Airworthiness Approval Note for a Major modification, Service Bulletin for a mandatory inspection.

2.3 All relevant records of modifications and mandatory inspection shall be made available to the Director for examination on request, and these shall not be destroyed without authorisation from the Director.

NOTE: The Air Navigation (Hong Kong) Order requires that log books, and other documents which are identified and referred to in the log books (therefore forming part of the log books) shall be preserved until a date two years after the aircraft, the engine or the variable pitch propeller, as the case may be, has been destroyed, or permanently withdrawn from use.

2.4 Where an owner or operator wishes to develop an alternative means of
compliance, the written agreement of the Director will be required. The aircraft technical records and where applicable the organisation’s modification system shall reflect the change from the MPD or the Manufacturers Alert Service Bulletin.

3 PROMULGATION

3.1 A collated volume of UK MPDs will be available from UKCAA Printing and Publications, Cheltenham. Individual MPDs of an emergency nature will be distributed to all registered owners of the type of aircraft concerned through the CAD Airworthiness Office.

4 REPORTING

4.1 The Director should be notified of any unsafe condition that has occurred, whether or not this was identified from an incident or an occurrence.

The following organisations, will need to notify the Director of incidents of airworthiness significance.

(a) A CAD approved design organisation or manufacturer of an aircraft type (including microlights).

(b) Any maintenance organisation or nominated person(s) engaged in the maintenance of such aircraft.

(c) In the case of military aircraft, organisations holding approval for a type where, through their liaison with the responsible design organisation (where such an organisation still provides design support) they have knowledge of newly promulgated mandatory action (e.g. Special Flying Instructions, Special Technical Instructions).

4.2 The purveyor or manufacturer of an aircraft kit should notify the Director of any unsafe condition of which he has knowledge.

4.3 The owner, pilot or operator of an aircraft operating on a Permit to Fly should notify the appropriate organisation in 4.1 or 4.2 above of an unsafe condition but may also voluntarily notify the Director directly via the CAD Occurrence Reporting Scheme or other appropriate means.

4.4 All incidents should be reported to the Director as soon as possible, and not more than 96 hours to the CAD Airworthiness Office.
Section 1.6

Continued Airworthiness – Responsibilities of the Operator
SECTION 1.6

SUB-SECTION 1.6-2

MAINTENANCE OF AIRCRAFT

1 INTRODUCTION

1.1 In accordance with the Air Navigation (Hong Kong) Order 1995 an aircraft registered in Hong Kong in respect of which a Certificate of Airworthiness in the Transport Category (Passenger), Transport Category (Cargo) or Aerial Work Category is in force, shall not fly unless it has been maintained in accordance with a Maintenance Schedule approved by the Director-General and Certificates of Maintenance Review issued, certifying that maintenance reviews have been carried out. Approved Maintenance Schedules are also required by this Sub-section for any other aircraft registered in Hong Kong.

1.2 Manufacturer’s Maintenance Programmes are not approved by the Director-General in accordance with the procedures set out in Sub-section 1.7-5, which refers to this Sub-section. This Sub-section 1.6-2 may be used by the manufacturer however, for guidance on the required content of an operator's Maintenance Schedule.

NOTES: (1) The term "Maintenance Programme" is intended to embrace both scheduled maintenance tasks and the associated procedures (including reliability monitoring). The term "Maintenance Schedule" is intended to embrace a document which includes the maintenance tasks alone including any associated approval documents, it would not normally include maintenance procedures.

(2) In addition to the requirements of this Sub-section, an aircraft shall not fly for the purpose of public transport otherwise than in accordance with an Air Operator's Certificate. The requirement for such a Certificate is contained in CAD 360 Air Operator's Certificates Requirements Document.

2 GENERAL

2.1 An aircraft registered in Hong Kong shall be maintained in accordance with a Maintenance Schedule or Maintenance Programme approved by the Director-General.

2.2 A reliability programme is required when specified by the manufacturer's Maintenance Planning Document or a Maintenance Review Board Report. Operators may, however, develop their own reliability monitoring programme when it may be deemed beneficial from a maintenance planning point of view.
3 MAINTENANCE SCHEDULE

3.1 General

Schedules and Programmes submitted for approval shall comply with this paragraph 3 as appropriate. The procedures which are required to be followed to obtain the Director-General's Approval of Maintenance Schedule are set out in Sub-section 1.7-5.

NOTE: Appendix No. 1 to Sub-section 1.6-2 contains supplementary information for Condition Monitored and Reliability Centred Maintenance Programmes including those associated with engines and auxiliary power units, installed in aircraft certificated in the Public Transport, Aerial Work or Private Categories.

3.2 Maintenance Schedule

The Schedule which is submitted to the Director-General for approval shall contain the basic information prescribed in (a), (b), (c), (d) and (e).

(a) General

(i) Reference number, issue number and date;

(ii) Registered name(s) and address(es) of the Owner(s)/Operator(s);

(iii) Type and model(s) of aircraft, engines, auxiliary power units, and, where applicable, propellers;

(iv) Areas of operation of the aircraft;

(v) Class of work in relation to the areas of operation;

(vi) Nationality and Registration Marks of aircraft maintained in accordance with the schedule;

(vii) Details of any arrangements involving the co-operation of more than one operator, or which involve the combination of information from other aircraft fleets for the purpose of providing additional statistical and sampling material: see also paragraph 2.6 of the Appendix No. 1 to this Sub-section.

NOTE: The Director-General will consider accepting a group of operators, who are operating similar aircraft, combining for the purpose of sampling, provided that:
they can demonstrate similarity of operations, procedures, modification standards and maintenance requirements;

- they are subject to similar overhaul procedures, and

- the sampling is not confined to any particular operator.

(b) **Primary Maintenance Processes**

In respect of each part of the aircraft, its engines and auxiliary power units, propellers, components, accessories, equipment, instruments, electrical and radio apparatus, and all associated systems and installations (hereinafter referred to as "an Item"), a list of the primary maintenance processes in terms of (i) to (vi):

(i) Cross reference, where applicable, to the source of the task (e.g. Maintenance Review Board Report (MRB) and Maintenance Planning Document (MPD));

(ii) Periods at which the item shall be inspected, together with the type and degree of inspection;

(iii) Periods at which the item shall, as appropriate, be checked, cleaned, lubricated, adjusted and tested;

(iv) Periods at which the item shall be overhauled or replaced by a new or overhauled item, expressed in terms of:

- a criterion related to usage, e.g. a period of time, number of cycles, number of landings;

- a criterion related to conditions, e.g. limits of wear, limiting dimensions.

NOTE: Where actual criteria are not included in the Schedule, they should be defined by cross reference to acceptable documents, e.g. Approval Maintenance Manual or Maintenance Planning Document.

(v) The Mandatory Life Limitations to which certain parts of aircraft, engines, propellers, auxiliary power units and systems, the failure of which could have a hazardous effect on the aircraft, are subject. These limitations, unless otherwise agreed by the Director-General, shall be identical to those specified in the Mandatory Life Limitations section of the manufacturer's recommended Maintenance Programme (see
Sub-section 1.5-3). The limitations may be itemised in the Schedule, or included by reference to the appropriate airworthiness data.

(vi) Such other processes as are agreed by the Director-General, e.g. condition monitoring (see Appendix No. 1 to this Sub-section).

(c) **Record of Amendments**

Provision for a record of the amendments incorporated in the Schedule.

(d) Reference to the source of the content of the Schedule, e.g. MRB, MPD, Maintenance Manual.

(e) **Check cycle criteria**

The criteria for 'packaging' checks shall be described (e.g. A Check – 400 FH, B Check – 800 FH etc.).

### 4 CERTIFICATE OF MAINTENANCE REVIEW

4.1 An aircraft registered in Hong Kong in respect of which a Certificate of Airworthiness in the Transport Category (Passenger), Transport Category (Cargo) or Aerial Work Category is in force, shall be subject to a maintenance review at intervals specified in the Approved Maintenance Schedule or the relevant Approval Document of the Maintenance Schedule, as appropriate. At the completion of a review, a Certificate of Maintenance Review shall be issued.

4.2 The Signatory shall only issue a Certificate of Maintenance Review when satisfied, at the time of the review, that the following aspects of maintenance have been carried out:

(a) All maintenance specified in the Approved Maintenance Schedule has been carried out within the prescribed time periods and any extension to limiting periods is in accordance with procedures approved by the Director-General.

(b) All modifications and inspections deemed mandatory by the Director-General have been carried out within the prescribed time periods and any extension to limiting periods has been authorised by the Director-General. Due account must be taken of any repetitive inspections.
(c) All defects entered in the Technical Log have been rectified or deferred in accordance with procedures approved by the Director-General.

(d) All Certificates of Release to Service required have been issued in accordance with the procedures of Sub-section 1.6-7 or HKAR-145 as necessary.

NOTES:  
(1) The time intervals for the Certificate of Maintenance Review will be specified on a calendar 'not exceed' basis only and therefore, it is not necessarily intended to align with any check.

(2) For aircraft the Maximum Total Weight Authorised of which does not exceed 2730 kg the maintenance review may coincide with the annual check, but must not exceed 12 calendar months period.

(3) The Certificate of Maintenance Review requires only one signature.

5  CERTIFICATE OF MAINTENANCE REVIEW FORMAT

5.1 The Certificate of Maintenance Review shall be in the following format:

CERTIFICATE OF MAINTENANCE REVIEW

Aircraft Type ........................................................................................................

Nationality & Registration Mark ......................................................................

Certified that a maintenance review of this aircraft and such of its equipment as is necessary for its airworthiness has been carried out in accordance with the requirements of the Air Navigation (Hong Kong) Order 1995 for the time being in force.

The next maintenance review is due .................................................................

Signed .................................................................................................................

CAD Approval/Licence .....................................................................................

Date ......................................................................................................................

Organisation .......................................................................................................
6 CERTIFICATE OF MAINTENANCE REVIEW SIGNATORIES

6.1 A Certificate of Maintenance Review shall be issued only by:

(a) The holder of an aircraft maintenance engineer's licence granted under the Air Navigation (Hong Kong) Order 1995 being a licence which entitles the holder to issue that certificate; or

(b) The holder of an aircraft maintenance engineer's licence granted under the law of a country other than Hong Kong and rendered valid under the Air Navigation (Hong Kong) Order 1995 in accordance with the privileges endorsed on the licence; or

(c) A person whom the Director-General has authorised to issue a Certificate of Maintenance Review in a particular case and in accordance with that authority; or

(d) A person approved by the Director-General as being competent to issue such certificates and in accordance with that approval.

6.2 In approving a Maintenance Schedule, the Director-General will specify who may issue a Certificate of Maintenance Review.

(i) For an Air Operator's Certificate holder also approved in accordance with HKAR-145 requirements for the type of aircraft reviewed, the signatory will be a person in the organisation authorised in accordance with the Appendix No.3 to HKAR-1 Sub-section 1.8-13.

(ii) For an Air Operator's Certificate holder having the fleet technical management of the aircraft handled by a HKAR-145 maintenance organisation approved for the type, the signatory will be a person in that HKAR-145 organisation authorised in accordance with the Appendix No. 3 to HKAR-1 Sub-section 1.8-13.

(iii) For an Air Operator's Certificate holder carrying out its own maintenance review but not HKAR-145 approved, the signatory will be a person in the organisation holding qualification and experience prescribed in the Appendix No. 3 to HKAR-1 Sub-section 1.8-13 for the purpose.

(iv) For an Air Operator's Certificate holder having the fleet technical management of the aircraft handled by an organisation that is not HKAR-145 approved, the signatory will be a person in the organisation holding qualification and experience prescribed in the Appendix No. 3 to HKAR-1 Sub-section 1.8-13 for the purpose.
7 CERTIFICATE OF RELEASE TO SERVICE

7.1 A Certificate of Release to Service shall be issued after overhauls, repairs, replacements, modifications and mandatory inspections have been carried out on an aircraft, which is registered in Hong Kong and has a Certificate of Airworthiness in force, except as follows:

(a) A Certificate of Release to Service is not required for certain prescribed repairs or replacements carried out on an aircraft not exceeding 2730 kg Maximum Total Weight Authorised with a Certificate of Airworthiness in the Private or Special Categories, provided the work has been carried out personally by the owner or operator holding a pilot's licence. Details of the prescribed repairs or replacements permitted are contained in the Air Navigation (General) Regulations.

(b) If a repair or replacement of a part of an aircraft is carried out when the aircraft is at such a place that it is not reasonably practicable:

(i) to carry out the work in a manner that a Certificate of Release to Service may be issued, or

(ii) for the Certificate to be issued at that particular place, the Commander may fly the aircraft, if, in his opinion, it is safe to do so, to the nearest place at which a Certificate may be issued.

NOTE: The Air Navigation (Hong Kong) Order 1995 prescribes that in such cases, written particulars of the flight and the reasons for making it are to be given to the Director-General within ten days thereafter.

7.2 A Certificate of Release to Service shall be issued at the completion of any Scheduled Maintenance Tasks specified by an Approved Maintenance Schedule on an aircraft which is registered in Hong Kong and has a Certificate of Airworthiness in any category (except Special Category) except that:

(a) A Certificate of Release to Service is not required for certain Scheduled Maintenance Tasks carried out on an aircraft not exceeding 2730 kg Maximum Total Weight Authorised with a Certificate of Airworthiness in the Private Category, provided the inspection has been carried out personally by the owner or operator holding a pilot's licence.

(b) The Certificate of Release to Service issued at the completion of any Scheduled Maintenance Tasks shall be signed in the licence/authorisation category relevant to the work speciality of the
7.3 A Certificate of Release to Service shall only be issued for a particular overhaul, repair, replacement, modification, mandatory inspection or Scheduled Maintenance Tasks when the signatory is (signatories are) satisfied that the work has been properly carried out, having due regard to the use of:

(a) up-to-date and approved airworthiness data including manuals, drawings, specifications, mandatory modifications/inspections and where applicable, company procedures;

(b) recommended tooling and test equipment which is currently calibrated where applicable; and

(c) a working environment appropriate to the work being carried out.

7.4 Certificate of Release to Service for aircraft with either a Transport Category (Passenger) or Transport Category (Cargo) Certificate of Airworthiness and when used for Commercial Air Transport shall be in accordance with HKAR-145.

7.5 For Non Commercial Air Transport purposes, the Certificate of Release to Service shall contain particulars of work done or the inspection completed and the organisation and place at which the work was carried out. Depending upon the application of the certificate, details of the aircraft type, registration, component type, part number and serial number shall be recorded as applicable. The certification shall be worded in the following manner:

'The work recorded above has been carried out in accordance with the requirements of the Air Navigation (Hong Kong) Order 1995 for the time being in force and in that respect the aircraft/equipment is considered fit for release to service.'

NOTE: Mandatory inspections, for the purpose of this Sub-section 1.6-2, are those inspections classified as mandatory by the Director-General, where the inspection itself is the work.

7.6 The Certificate of Release to Service shall be signed by a person specified in paragraph 8, except that the Director-General may direct which of these persons shall sign in a particular case. The signatory/signatories shall record licence/approval/authorisation reference number as appropriate, together with the date.
8 CERTIFICATE OF RELEASE TO SERVICE SIGNATORIES

8.1 For aircraft with either a Transport Category (Passenger) or Transport Category (Cargo) Certificate of Airworthiness and when used for Commercial Air Transport, a Certificate of Release to Service shall only be issued by appropriately authorised staff on behalf of the HKAR-145 Approved Maintenance Organisation, in accordance with procedures specified in the Maintenance Organisation Exposition.

8.2 For Non Commercial Air Transport purposes, a Certificate of Release to Service shall be issued only by one of the following:

(a) The holder of an aircraft maintenance engineer's licence granted under the Air Navigation (Hong Kong) Order 1995, being a licence which entitles the holder to issue that certificate.

(b) The holder of an aircraft maintenance engineer's licence granted under the law of a country other than Hong Kong and rendered valid under the Air Navigation (Hong Kong) Order 1995 in accordance with the privileges endorsed on the licence.

(c) The holder of an aircraft maintenance engineer's licence or authorisation as such an engineer granted or issued by or under the law of any Contracting State other than Hong Kong in which the overhaul, repair, replacement, modification or inspection has been carried out, but only in respect of aircraft of which the Maximum Total Weight Authorised does not exceed 2730 kg and in accordance with the privileges endorsed on the licence.

NOTE: 'Contracting State' means any State which is a party to the Convention on International Civil Aviation at Chicago on 7th December 1944.

(d) A person approved by the Director-General as being competent to issue such Certificates, and in accordance with that approval.

(e) A person whom the Director-General has authorised to issue the Certificate in a particular case, and in accordance with that authority.

8.3 In relation only to the adjustment and compensation of direct reading magnetic compasses, the holder of an Airline Transport Pilot's Licence (Aeroplanes), or a Flight Navigator's Licence granted or rendered valid under the Air Navigation (Hong Kong) Order 1995 may also issue a Certificate of Release to Service.
DUPLICATE INSPECTION

9.1 The procedures outlined in this paragraph shall be applied following initial assembly or any disturbance of a control system or vital point (See HKAR-1 Sub-section 1.5-3 for vital points).

9.2 Definitions

9.2.1 Control System

A system by which the flight path, attitude, or propulsive force of an aircraft is changed, including the flight, engine and propeller controls, the related system controls and the associated operating mechanisms.

9.2.2 Duplicate Inspection

An inspection first made and certified by one qualified person and subsequently made and certified by a second qualified person.

9.3 Procedures - General

9.3.1 A duplicate inspection of all control systems and vital points in an aircraft shall be made after initial assembly and before a Certificate of Release to Service has been issued after overhaul, repair, replacement, modification or adjustment and, in any case, before the first flight.

NOTE: Dependent on the extent of the work it may be possible to limit the duplicate inspection of a control system or vital point to that part of the system which has been disturbed.

9.3.2 The first and second inspections must take account of the full extent of the work undertaken and not simply the immediate area of disturbance. This is to ensure that distant or remote parts of the system that may have been affected by the disturbance are also subject to duplicate inspections. Where work has been carried out on other systems for safety precautions, or to enhance accessibility, the need to carry out a duplicate inspection on these systems shall be considered. Persons who carry out and certify duplicate inspections are therefore required to undertake an independent review of the complete task, as detailed in the maintenance manual and by reference to worksheets used, including shift hand-over records, to assess the scope of the duplicate inspections(s) required.

9.3.3 It may not be possible to inspect the complete control system when assembled in the aircraft, due to routing the controls through conduits...
or boxed-in sections and the pre-sealing of various units. In these cases the persons certifying the duplicate inspection shall be satisfied that a duplicate inspection has been made previously on the units and covered sections and that the sealed units are acceptable for the particular use. Such tests as are necessary shall be completed to determine that these particular units and sections have full, free and correct directional movement.

9.3.4 Control systems and vital points subject to duplicate inspection must not be disturbed or re-adjusted after the first certified inspection and the second part of the duplicate inspection must, as nearly as possible, follow immediately after the first part.

NOTES: (1) In some circumstances, due to peculiarities of assembly or accessibility, it may be necessary for both parts of the inspection to be made simultaneously.

(2) It is desirable that the inspections of a control system are made as near as is practicable to the time of the intended flight and that the full extent of the disturbance is understood by both persons who carry out the duplicate inspections.

9.3.5 If a control system or vital point is disturbed after completion of the duplicate inspection, that part which has been disturbed shall again be inspected in duplicate and a Certificate of Release to Service issued before the aircraft flies.

9.3.6 The duplicate inspection shall be the final operation to establish the integrity of the control system or a vital point when all the work has been completed and shall take into account all the relevant instructions and information contained in the associated technical data.

9.3.7 The inspections prescribed for control systems in this Sub-section shall include an inspection to ensure that full, free and correct movement of the controls is obtained throughout the systems relative to the movements of the crew controls. An additional inspection shall be made, when all covers and fairings are finally secured, to ensure that full, free and correct movement of the controls is obtained.

9.3.8 Persons qualified to make the first and/or second part of a duplicate inspection are as follows:

(a) Aircraft engineers appropriately licensed in HKAR-66 Category B.

(b) Persons employed by Approved Organisations, who are
appropriately authorised to make such inspections and to certify the task itself in accordance with company procedures. For aircraft with either a Transport Category (Passenger) or Transport Category (Cargo) Certificate of Airworthiness and when used for the purpose of Commercial Air Transport an organisation will be required to hold HKAR-145 Approval.

NOTE: Certification responsibilities in relation to the Air Navigation (Hong Kong) Order 1995 affecting licensed aircraft maintenance engineers and members of approved organisations are given in Hong Kong Airworthiness Notice No. 3.

9.3.9 Should a minor adjustment of the control system be necessary when the aircraft is away from base, the second part of the duplicate inspection may be completed by a pilot or flight engineer licensed for the type of aircraft concerned, providing that Authorisation is granted by the responsible HKAR-145 Approved Maintenance Organisation, if the aircraft is being used for the purpose of Commercial Air Transport.

9.4 Procedures - Control System Units or Components

9.4.1 Where appropriate to the type of unit or component forming part of a control system, a schedule of inspections and functioning tests shall be compiled at manufacture, overhaul and repair, and the following shall be certified:

(a) Duplicate inspection of the section/parts of the units or components which will be concealed during bench assembly and which cannot be proved during inspections and functioning tests when installed in the aircraft control system.

NOTE: Where such work is a sub-contract order, instructions regarding all inspection/tests should be stated on the order, the release documentation from the sub-contractor being certified appropriately.

(b) Duplicate inspection of the completed assembly of the unit or component, functioning and checking for correct relative movement.

9.4.2 Persons qualified to make the first and/or second part of the duplicate inspection required at paragraph 9.4 are as follows:

(a) For approved manufacturing organisations, persons employed who are appropriately authorised and qualified to make such inspections in accordance with company procedures. Persons
employed by a sub-contracting firm, not directly approved by the Director-General, who are appropriately authorised by the primary approved organisation with a Quality Control Surveillance System (See Sub-section 1.8-2) controlling the sub-contractor, qualified to make such inspections.

(b) For approved maintenance organisations who release control system units and components, both inspections and the subsequent Certificates of Release to Service must be issued by persons authorised by the maintenance organisation approved under HKAR-145 or HKAR-1 Section 1.8.

10 RETENTION OF MAINTENANCE RECORDS

10.1 When all the relevant work has been carried out, a Certificate of Release to Service shall be entered in/attached to the appropriate log book and signed by the authorised persons.

(a) Where it is more convenient, the required particulars may be entered in a separate record, but an entry shall be made in the appropriate log book, containing a summary of the work carried out and a cross-reference to the document containing the Certificate of Release to Service.

(b) Where an alternative record system has been agreed, the format and location of such certificates shall be in accordance with that agreement.

(c) Certificates of Maintenance Review shall be issued in duplicate. One copy shall be carried in the aircraft and the other copy shall be kept elsewhere than in the aircraft for a period of not less than two years from the date of issue or for such periods as may be otherwise agreed.

NOTE: (1) The Air Navigation (Hong Kong) Order 1995 requires that log books, and other documents which are identified and referred to in the log books (therefore forming part of the log books) shall be preserved until a date two years after the aircraft, the engine or the variable pitch propellers, as the case may be, has been destroyed, or permanently withdrawn from use, except that the Director-General may consider a different retention period in a particular case.

(2) For aircraft operated for the purpose of Commercial Air Transport in accordance with CAD 360, the operator shall ensure that maintenance records are retained in accordance with CAD 360 and/or HKAR-145 as appropriate.
10.2 The owner shall ensure that the following records are kept for the periods mentioned in 10.3:

(a) The total time in service (hours, calendar time and cycles, as appropriate) of the aircraft and all life limited components;

(b) The current status of compliance with all mandatory continuing airworthiness information;

(c) Appropriate details of modifications and repairs;

(d) The time in service (hours, calendar time and cycles, as appropriate) since last overhaul of the aircraft or its components subject to a mandatory overhaul life;

(e) The current status of the aircraft’s compliance with the approved Maintenance Schedule; and

(f) The detailed maintenance records to show that all requirements for signing a Certificate of Release to Service have been met.

10.3 The records referred to in 10.2 (a) to (e) shall be kept until a date two years after the aircraft to which they refer has been permanently withdrawn from service, and the records in 10.2 (f) for a minimum period of two years after the signing of the Certificate of Release to Service.

10.4 The lessee of an aircraft shall comply with the requirements of 10.2 and 10.3, as applicable, while the aircraft is leased.
APPENDIX NO. 1 TO SUB-SECTION 1.6-2

MAINTENANCE PROGRAMMES

RELIABILITY CENTRED MAINTENANCE AND CONDITION MONITORED MAINTENANCE PROGRAMMES

1 INTRODUCTION

1.1 This Appendix describes an acceptable means of compliance with the requirements of Sub-section 1.6-2 in respect of Reliability Centred and Condition Monitored Maintenance Programmes where maintenance task selection and frequency are based upon reliability predictions. The word Programme is used throughout and refers to the reliability monitoring procedures. Condition Monitored Maintenance concepts were fundamental to earlier Maintenance Steering Group (MSG) derived programmes (e.g. MSG 2) and where appropriate, the MSG analysis resulted in a condition monitoring task: Condition Monitored Maintenance is a form of Reliability Centred Maintenance. The Condition Monitor task was not used in later MSG revisions (e.g. MSG 3) but the concept of Reliability Centred Maintenance is, however, central to the continuing effectiveness of these later programmes where maintenance task selection and frequency are based upon reliability predictions.

1.2 MSG analysis and the attendant MRB procedures, are used by type certificate applicants to develop scheduling information to meet the JAR (FAR) 25.1529 Appendix H instructions for continuing airworthiness. The MRB procedures may be found in JAA Administrative and Guidance Material Section 2, Part 2 Chapter 16, FAA AC 121.22A or Sub-section 1.5-2. For type certification prior to the adoption of JAR-25, requirement for continuing airworthiness information is to be found in Sub-section 1.5-3.

NOTE: Further guidance on these concepts of maintenance control is contained in CAD 418 entitled 'Condition Monitored Maintenance Programmes, an Explanatory Handbook', published by the Director-General.

1.3 A description of how each part of the requirement of Sub-section 1.6-2 will be met, should be included in the Preface of the Approved Maintenance Schedule. This description may, by agreement with the Director-General, be presented in another form provided that full cross reference to associated documentation is made in the Approved Maintenance Schedule.
2 THE PROGRAMME

2.1 In preparing the Programme details for compliance with Sub-section 1.6-2, account should be taken of this paragraph, and for engines and auxiliary power-units, account should also be taken of paragraph 3 of this Appendix. All associated procedures should be clearly defined.

2.2 Objectives

A statement should be included summarising as precisely as possible the prime objectives of the Programme. The extent of the objectives should be directly related to the scope of the Programme, which could vary from a component defect monitoring system to an integrated maintenance management programme. The manufacturer's maintenance planning documents may give guidance on the objectives and should be consulted in every case.

2.3 Identification of Items

The items controlled by the Programme should be stated. Where some items (e.g. aircraft structure, engines, APU) are controlled by separate inspection and development procedures, the associated procedures will be subject to individual approval by the Director-General, e.g. individual Sampling or Life Development Programmes, Constructor's Structure Sampling Programmes.

2.4 Terms and Definitions

The significant terms and definitions applicable to the Programme should be clearly identified. Terms already defined in the World Airlines Technical Glossary of Terms and CAD 418 should be used. The number of other defined terms should be kept to a minimum.

2.5 Information Sources and Collection

2.5.1 Sources of information should be listed, and the procedures for the transmission of information from the sources, together with the procedure for collecting and receiving it, should be set out in detail.

2.5.2 The type of information to be collected should be related to the objectives of the Programme and should be such that it enables both an overall broad based assessment of the information to be made and also allows for assessments to be made as to whether any reaction, both to trends and to individual events, is necessary. The following are examples of the normal prime sources:-
(a) Pilots Reports.
(b) Technical Logs.
(c) Aircraft Maintenance Access Terminal/On-board Maintenance System readouts.
(d) Maintenance Worksheets.
(e) Workshop Reports.
(f) Reports on Functional Checks.
(g) Reports on Special Inspections.
(h) Stores Issues/Reports.
(i) Air Safety Reports.
(j) Reports on Technical Delays.

2.5.3 In addition to the normal prime sources of information, due account should be taken of continuing airworthiness and safety information promulgated by Airworthiness Authorities, Constructors and Manufacturers.

2.6 Pooling Arrangements

In some cases, in order that sufficient data may be analysed, it may be desirable to 'pool' data: i.e. collate data from a number of Operators of the same type of aircraft, engine or APU. For the analysis to be valid, the aircraft concerned, mode of operation, and maintenance procedures applied must be substantially the same. Variations in utilisation between two Operators may more than anything, fundamentally corrupt the analysis. Although not exhaustive, the following list gives guidance on the primary factors which need to be taken into account:-

(a) Aircraft, engine or APU design commonality.
(b) Modification embodiment state, including Service Bulletin compliance.
(c) Operational environment, route structure, engine hours/cycle ratio.
(d) Aircraft age.
(e) Utilisation, e.g. Low/High/Seasonal etc.

(f) Respective fleet size.

(g) Operating rules applicable (e.g. ETOPS/RVSM/All Weather etc.).

(h) Operating procedures.

(i) Maintenance procedures.

(j) Maintenance standards applicable.

(k) Lubrication programme.

(l) Maintenance Planning Data revision or escalation applied or maintenance programme/schedule applicable.

(m) Data collection procedures.

(n) Engine/APU refurbish/rework specification.

Although it may not be necessary for all of the foregoing to be completely common, it is necessary for a substantial amount of commonality to prevail. Changes by any one of the Operators to the above, requires assessment in order that the pooling benefits can be maintained. Where an Operator wishes to pool data in this way, the approval of the Director-General should be sought prior to any formal agreement being signed between Operators.

2.7 Displays

2.7.1 Collected information may be displayed in either graphical or tabular presentations or a combination of both. The rules governing any separation or discarding of information prior to incorporation into these displays should be stated. The format of any display should be such that the identification of trends, specific highlights and related arisings would be readily apparent.

2.7.2 Displays should include provisions for 'nil returns' to aid the examination of the total information.

2.7.3 Where 'standards' or 'alert levels' are included in the Programme, the display information should be oriented accordingly.
2.8 Examination, Analysis and Interpretation of Information

2.8.1 The method employed for examining, analysing and interpreting the Programme information should be explained.

(a) Examination

Methods of examination of information may be varied according to the content and quantity of information of individual Programmes. These can range from examination of the initial indication of performance variations to formalised detailed procedures at specified periods and the methods should be fully described in the Programme documentation.

(b) Analysis and Interpretation

The procedures for analysis and interpretation of information should be such as to enable the performance of the items controlled by the Programme to be measured. They should also facilitate recognition, diagnosis and recording of significant problems. The whole process should be such as to enable a critical assessment to be made of the effectiveness of the Programme as a total activity. Such a process may involve:-

(i) Comparisons of operational reliability with established or allocated standards (in the initial period these could be obtained from in-service experience of similar equipment or aircraft types).

(ii) Analysis and interpretation of trends.

(iii) The evaluation of repetitive defects.

(iv) Confidence testing of expected and achieved results.

(v) Studies of life-bands and survival characteristics.

(vi) Reliability predictions.

(vii) Other methods of assessment.

2.8.2 The range and depth of engineering analysis and interpretation should be related to the particular Programme and to the facilities available. The following, at least, should be taken into account:-

Issue 2  1.6-2 A1 P.5  31 January 2009
(a) Flight defects and reductions in operational reliability.
(b) Defects occurring on-line and at main base.
(c) Deterioration observed during routine maintenance.
(d) Workshop and overhaul facility findings.
(e) Modification evaluations.
(f) Sampling programmes.
(g) The adequacy of maintenance equipment and publications.
(h) The effectiveness of maintenance procedures.
(i) Staff training.
(j) Service bulletins, technical instructions, etc.

2.8.3 Where the Operator relies upon contracted maintenance and/or overhaul facilities as input to the Programme, the arrangements for availability and continuity of such information should be established and details should be included.

2.9 Corrective Actions

2.9.1 The procedures and time scales both for implementing corrective actions and for monitoring the effects of corrective actions should be fully described. Corrective actions should correct any reduction in reliability revealed by the Programme and could take the form of:-

(a) Changes to operational procedures or techniques.
(b) Maintenance changes involving inspection frequency and content, function checks, overhaul requirements and time limits, which will require amendment of the scheduled maintenance periods or tasks in the Approved Programme.
(c) Amendments to Approved manuals (e.g. Maintenance Manual, Crew Manual).
(d) Initiation of modifications.
(e) Special inspections or fleet campaigns.
(f) Spares provisioning.
(g) Staff training.
(h) Manpower and equipment planning.

2.9.2 The procedures for effecting changes to the Programme should be
described, and the associated documentation should include a planned
completion date for each corrective action, where applicable.

2.10 Organisational Responsibilities

The organisational structure and the departments responsible for the
administration of the Programme should be stated. The chains of
responsibility for individuals and departments (Engineering, Production,
Quality Control, Operations, etc.) in respect of the Programme, together with
the formation and functions of any Programme control committees, should be
defined.

2.11 Presentation of Information to the Director-General

The production of reports and the notification of Programme events to the
Director-General will have to be agreed with the Director-General. As the
information to be supplied to the Director-General will vary for individual
Programmes, the Programme and its associated documentation should define
at least the following:-

(a) The format and content of routine and event reports.
(b) The time scales for the production of reports together with their
distribution.
(c) Details of any special reports (Annual Reports, special investigations,
   etc.).
(d) Reports supporting requests for increases in periods between
   maintenance (escalation) and for amendments to the Programme.
   These reports should contain sufficient detailed information to enable
   the Director-General to make its own evaluation where necessary.
(e) The production and distribution of agenda and minutes of various
   meetings related to the Programme and its functions.
(f) The identification of the availability of any non-reportable information which may be used to support the Programme (e.g. 'in-house' information).

(g) Any relationship between the reporting procedures of the Programme and the requirements for Mandatory Occurrence Reporting.

2.12 Evaluation and Review

2.12.1 Each Programme should describe the procedures and individual responsibilities in respect of continuous monitoring of the effectiveness of the Programme as a whole. The time periods and the procedures for both routine and non-routine reviews of maintenance control should be detailed (progressive, monthly, quarterly, or annual reviews, procedures following reliability 'standards' or 'alert levels' being exceeded, etc.).

2.12.2 Each Programme should contain procedures for monitoring and, as necessary, revising the reliability 'standards' or 'alert levels'. The organisational responsibilities for monitoring and revising the 'standards' should be specified together with associated time scales.

2.12.3 Although not exhaustive, the following list gives guidance on the criteria to be taken into account during the review:-

(a) Utilisation.
(b) Fleet commonality.
(c) Alert level adjustment criteria.
(d) Adequacy of data.
(e) Reliability procedure audit.
(f) Staff training.
(g) Operating and maintenance procedures.

2.13 Condition Monitored Maintenance

Condition monitoring is not acceptable as the primary maintenance process for any items, the failure of which can produce:-

(a) a hazardous increase in crew work load; or
(b) degradation of flight qualities, performance or strength of the aircraft; or
(c) fire; or
(d) the necessity for an unscheduled landing, marginal conditions for occupants or injury to occupants.

NOTE: The prohibition is not applicable to 'real-time' installed condition monitoring systems such as Helicopter Usage Monitoring system.

2.14 Operator Reliability Programmes

2.14.1 Operators who select to submit for approval a reliability centred maintenance programme, even though the Type Certificate holder may not require it, must include in the programme a classification listing which will indicate the importance of each item to continued airworthiness of the aircraft in the event of failure of the item so classified. Normally, this classification is applied after consultation between the Operator, Constructor and the Director-General, but, alternatively, due account may be taken of MRB findings and MSG logic analysis in arriving at the appropriate classification.

NOTE: The classification listing criteria may also be applied to maintenance schedule/programmes which do not employ an associated reliability programme, since the classifications have been found useful in determining airworthiness significance of escalation revisions.

2.14.2 Classifications should be as follows:-

(a) Items, the failure of which, would reduce the airworthiness of the aircraft to an unacceptable level. The reliability of such items will be controlled by the allocation of an overhaul period and/or Failure Rate Monitoring.

(b) Items, the failure of which, may reduce the airworthiness of the aircraft but not to an unacceptable level. Such items will be controlled by Failure Rate Monitoring. Where it is known that an item is subject to wear or deterioration, the allocation of an overhaul period may be necessary.

(c) Items, the single failure of which does not affect the airworthiness of the aircraft.

NOTE: There are certain items in the aircraft, the failure of which, when associated
with an emergency, could endanger the aircraft, e.g. warning circuits normally dormant. Such items may not be included in the above classification but are monitored in accordance with scheduled check inspection, functioning or test procedures.

3 MAINTENANCE PROGRAMMES - ENGINES AND AUXILIARY POWER UNITS

3.1 Introduction

The paragraph 3 defines an acceptable means of compliance with the requirements of Sub-section 1.6-2 for engines and auxiliary power units (engine/APU) in respect of Reliability Centred Maintenance and Condition Monitored Maintenance Programmes.

3.2 Applicability

A Reliability Centred Maintenance and Condition Monitored Maintenance Programme for an engine/APU is required when the restoration task for the engine/APU is not defined as either a Hot Section Inspection (HSI) and/or overhaul in accordance with the Constructor's approved engine overhaul manual.

3.3 Approval

Engine/APU Programmes should comply with this paragraph 3 and form part of the associated aircraft Programme. The procedures which are to be followed to obtain the Director-General's approval of Programmes, and amendments to them, are set out in Sub-section 1.7-5.

3.4 The Programme

3.4.1 Introduction

An engine/APU Reliability Centred Maintenance and Condition Monitored Maintenance Programme provides for the integration of Reliability Analysis, Hard Time Control, On Condition and Condition Monitoring into one Programme. It may vary in size and scope depending on the complexity and number of different engine and APU types being controlled by the Programme. The Programme sets out the means to identify both on-wing and off-wing maintenance tasks. On-wing engine/APU maintenance tasks and their intervals are initially established from Maintenance Review Boards (MRBs). Off-wing maintenance tasks and intervals are initially established by means of threshold and opportunity samples, Constructor's Engine
Maintenance Planning Guides and the inspection requirements of the Engine Manuals. The on-wing and off-wing maintenance tasks and intervals may be changed as a result of reviewing the experience gained by operating the Programme and information provided in Service Bulletins, Manual Revisions, Service Letters, Airworthiness Directives and other relevant sources.

NOTE: For the purposes of this Appendix, off-wing maintenance tasks are defined as the content of engine/APU rework or refurbish specifications and their associated time related intervals.

3.4.2 Objectives

A statement should be included summarising the objectives of the Programme, together with a definition of the engines/APU types controlled by the Programme and the associated aircraft in which those engine/APU types are installed.

3.4.3 Identification

The engine/APU Programme document can be unique and separate from the associated aircraft Programme or it can form part of the aircraft Programme. If it is a separate document, it should be identified by a reference number, issue number and date and be cross referred from the appropriate part of the aircraft Programme.

3.4.4 Data Pooling Arrangements

See paragraph 2.6 of the Appendix for the primary factors which, where appropriate, should be taken into account for engines and APUs.

3.4.5 Sub-contract

CAD 360 Air Operators' Certificates Requirements Document makes provision for the Operator to enter into a sub-contract arrangement with an Organisation which has the necessary resources and experience on the engine/APU type, to manage the Programme, and is acceptable to the Director-General. However, this sub-contract arrangement does not absolve the Operator from the overall responsibility for ensuring the safe operation and continuing airworthiness of the aircraft to which the engine/APU is installed.
3.4.6 **Data Collection, Analysis and Interpretation**
(See also paragraphs 2.5 and 2.8 of this Appendix.)

The data required for analysis and control of the engine/APU Programme together with associated procedures for the collection analysis and interpretation of the data should be defined in the Programme. The following is typical of the data which should be collected for an engine/APU Programme:

(a) Oil consumption trend monitoring.
(b) Pilots Reports.
(c) Aircraft Maintenance Access Terminal/On-board Maintenance System readouts.
(d) Boroscope inspection findings.
(e) Magnetic Chip Detector findings.
(f) In flight shut down, abandoned take-off, unscheduled removal rates and causes.
(g) Delay and cancellation rates and causes.
(h) Performance trend analysis.
(i) Engine and APU removal reports.
(j) Airworthiness Directives.
(k) Manufacturer's information and publications, e.g. Service Bulletins, Service Letters, All Operator Wires, etc.
(l) Engine/APU and Component Workshop Strip and Condition reports.
(m) Vibration monitoring.
(n) Sampling programme findings.
(o) Reliability Programme (statistical displays).

The final list of data to be collected, analysed and interpreted should be related to the objectives of the Programme and experience of operating
the particular engine/APU type.

3.4.7 **Sampling Programme**

The Programme should define a threshold life at which a sample engine/module or APU should be scheduled for removal if sufficient data regarding engine/module or APU internal conditions has not been generated by previous scheduled or unscheduled removals. Subsequent requirements should be based upon a review of all applicable evidence e.g. defect investigations, workshop investigations, health monitoring data and evidence from other Operators.

3.4.8 **Technical Record Keeping and Life Limited Components**

The Programme should give details of the method used and organisational responsibilities for recording flying hours, engine/APU cycles, training "touch and go" landings etc. which are needed to show compliance with the mandatory life limitations of the engine/APU and for controlling 'hard' and 'soft' time intervals. The procedure for complying with Airworthiness Notice No.44 where applicable, should also be defined.

3.4.9 **Refurbish and Rework Specifications**

Every engine, module and APU whose restoration task is not defined as either a HSI or Overhaul in accordance with an appropriate Overhaul Manual (Engine Manual) should have a rework or refurbish specification established in accordance with the procedures defined in the Programme. The Specification should define the minimum modification standard and the degree of strip inspection and rework necessary to release an engine, module or APU for specified periods of service usage. The content of the Specification should be based upon the appropriate Constructor's Maintenance Planning Guides, threshold and opportunity samples, the inspection requirements of the engine manuals and the review and analysis of the data collected by the Programme.

3.4.10 **Repair and Overhaul Organisations**

The Programme should define the nominated HKAR-145 Approved engine and APU repair and overhaul Organisations which are to be used, together with any contractual instructions to which the Organisations will be required to work.
3.4.11 Corrective Actions (See also paragraph 2.9 of this Appendix)

The Programme should define the means by which the collected data is routinely analysed and interpreted in order to monitor the effectiveness of the current on-wing and off-wing maintenance tasks and airworthiness of the fleet and so identify the need for any remedial action and appropriate timescales. The procedure for changing or escalating any of the on-wing and off-wing tasks, inspections and time intervals should also be defined in the Programme.

3.4.12 Organisational Responsibilities

The Organisational structure of the Operator and where appropriate the sub-contracted maintenance, repair and overhaul Organisations responsible for the administration and control of the Programme should be defined. The responsibilities for decision making with respect to both the on-wing and off-wing elements of the Programme shall be clearly defined in the Programme.

3.4.13 Management Evaluation and Review (See also paragraph 2.12 of this Appendix)

The programme should be managed effectively and ensure that good communications prevail between the various technical and quality departments of the Operator and if appropriate, the sub-contracted maintenance, engine and APU repair and overhaul Organisations. The Programme should define how the review, agreement, coordination and communication are ensured in the following areas:-

(a) Contractual Arrangements

Where the Operator sub-contracts any of the on-wing or off-wing engine/APU maintenance, repair and overhaul, Programmes require the details of the arrangements for maintenance, repair and overhaul to be clearly defined in a written maintenance contract. This is necessary to ensure that the technical and quality personnel of all the sub-contract Organisations which are involved in the application of the contract have a common understanding of the technical requirements of the Programme and of their respective duties and responsibilities.

(b) Engine/APU Workscopes

Each engine, module and APU upon removal from an aircraft,
should have an individual workscope prepared. The workscope should detail the reason for removal, engine/APU hours and cycles accrued in service, list any outstanding defects and define the required work to be carried out during the shop visit, cross referring, where appropriate, to the refurbish specification. The content of the workscope should also reflect any corrective actions which the Programme has previously identified as needing to be carried out at this shop visit. Where sub-contract arrangements exist, the content of the workscope should be agreed by the Operator and the sub-contract maintenance, engine repair and overhaul Organisation as appropriate.

(c) **Rework and Refurbish Specification**

Regular liaison between the technical and quality personnel of the Operator and where appropriate, the sub-contract maintenance, engine/APU repair and overhaul Organisation should take place to review, and update the content of the engine, module and APU rework and refurbish specifications. The review should be based upon the results of the analysis conducted upon the data collected in accordance with paragraph 3.4.6 of this Appendix.

(d) **Technical and Quality Review**

It is necessary for the Operator and where appropriate the sub-contracted maintenance, engine repair and overhaul Organisations to periodically review all of the data inputs and reliability analysis defined in the Programme together with any adverse quality audit findings and action taken. The review should seek to adjust "alert levels", identify trends, address any reduction in reliability or increase of in-flight shut down rate, delays, and cancellations and so implement any necessary remedial action.

(e) **Management Overview**

Every Programme should have a controlling body which is responsible for the implementation, decision making and overall running of the Programme. Management at a senior level (Quality Manager, Engineering Manager etc.) should periodically review the effectiveness of the Programme, and where necessary, implement changes.
3.4.14 Changes to the Programme

Any significant changes to the Programme will require approval of the Director-General. (See also paragraph 3.3 of this Appendix)
1 INTRODUCTION

This Sub-section 1.6-4 prescribes the requirements for the weighing of aircraft, the determination of the corresponding Centre-of-Gravity (C.G.) position and the provision of information from which the loading for flight can be correctly determined.

NOTE: The operator’s responsibilities are prescribed in the Air Navigation (Hong Kong) Order 1995.

2 DEFINITIONS

2.1 Basic Weight

Basic Weight is the weight of the aircraft and all its basic equipment, plus that of the declared quantity of unusable fuel and unusable oil. In the case of turbine-engined aircraft and aircraft the Maximum Total Weight Authorised of which does not exceed 5700 kg, it may also include the weight of usable oil.

2.2 Basic Equipment

Basic Equipment is the unconsumable fluids, and the equipment which is common to all roles for which the operator intends to use the aircraft.

2.3 Variable Load

Variable Load is the weight of the crew, of items such as the crew’s baggage, removable units, and other equipment the carriage of which depends upon the role for which the operator intends to use the aircraft for the particular flight.

2.4 Disposable Load

Disposable load is the weight of all persons and items of load, including fuel
and other consumable fluids, carried in the aircraft, other than the Basic Equipment and Variable Load.

NOTE: To obtain the total loaded weight it is necessary to add to the Basic Weight the weights of those Variable and Disposable Load items which are to be carried for the particular role for which the aircraft is to be used.

3 GENERAL

3.1 Aircraft shall be weighed when all manufacturing processes have been completed, and in accordance with the procedures in this paragraph 3.

NOTE: The Director-General will consider applications from aircraft constructors and operators to weigh certain types of aircraft on a sampling basis (i.e. representative aircraft, as weighed, would be acceptable for others of the same standard).

3.1.1 Aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg, shall be re-weighed within two years after the date the Certificate of Airworthiness is first issued in Hong Kong, and subsequent check weighing shall be made at intervals not exceeding five years, and at such times as the Director-General may require.

3.1.2 Aircraft, the Maximum Total Weight Authorised of which does not exceed 5700 kg, shall be re-weighed at such times as the Director-General may require.

3.2 When an aircraft is weighed, the condition of the aircraft (i.e. the equipment and other items of load such as fluids in tanks) shall be recorded. The equipment installed should not differ from that included in the declared list of Basic Equipment associated with the Weight and Centre-of-Gravity Schedule or the Loading and Distribution Schedule as appropriate.

3.3 The Basic Weight and the corresponding C.G. position shall be determined and entered in the Weight and Centre-of-Gravity Schedule or in the Loading and Distribution Schedule as appropriate.

3.4 The Director-General may require that the actual weight of the items of Variable Load be ascertained.

3.5 A Weighing Record containing records of the weighing and the calculations involved shall be made available to the Director-General, and such records shall be retained by the operator. When the aircraft is again weighed the previous Weighing Record shall be retained with the aircraft records.
3.6 Operators shall maintain records of all known weight and C.G. changes which occur after the aircraft has been weighed, and such records shall be retained by the operator.

4 **WEIGHT AND BALANCE REPORT - AIRCRAFT EXCEEDING 5700 kg**

A Weight and Balance Report shall be produced for each Prototype, Variant and Series aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg.

5 **WEIGHT AND CENTRE-OF-GRAVITY SCHEDULE - AIRCRAFT EXCEEDING 2730 kg** (see Sub-section 1.7-10 Appendix No. 1)

A Weight and Centre-of-Gravity Schedule shall be provided for each aircraft, the Maximum Total Weight Authorised of which exceeds 2730 kg, except that for an aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg the information contained in Parts B and C of the Schedule may, for a new aircraft, be given as part of the Weight and Balance Report.

6 **WEIGHT AND CENTRE-OF-GRAVITY SCHEDULE - AIRCRAFT NOT EXCEEDING 2730 kg** (see Sub-section 1.7-10 Appendix No. 2)

For aircraft, the Maximum Total Weight Authorised of which does not exceed 2730 kg, either a Weight and Centre-of-Gravity Schedule which complies with paragraph 5 and shall contain instructions for the determination of the loaded weight, the total moments and resultant Centre-of-Gravity positions, or a Loading and Distribution Schedule which complies with paragraph 3 of Sub-section 1.7-10 shall be provided.
APPENDIX NO. 1 TO SUB-SECTION 1.6-4
WEIGHT AND BALANCE OF AIRCRAFT - FLEET MEAN WEIGHT
AND FLEET MEAN CENTRE-OF-GRAVITY

1 INTRODUCTION  (See Sub-section 1.6-4, paragraph 3)

An alternative arrangement to the periodical check weighing of individual aircraft is to establish a Fleet Mean Weight and Fleet Mean Centre-of-Gravity Position, and this method is acceptable to the Director-General where an operator uses three or more aircraft of the same type. Application for acceptance of this arrangement should be made in writing to the CAD Airworthiness Office, giving a table of aircraft weights which it is intended will form the basis of the Fleet Mean Weight. Where such an arrangement is adopted, the provisions of this Appendix No.1 will apply.

2 GENERAL

This Initial Fleet Mean Weight should be based on the mean of the weights of all the aircraft of the same type in the fleet, and this should be reviewed annually by sample weighing (see paragraph 3).

2.1 The Fleet Mean Weight is the greatest of the following weights:-

(a) The mean Basic Weight of all aircraft of the same type in the fleet.

(b) The mean Basic Weight of aircraft of the same type in the most recent sample weighings.

(c) The Basic Weight of the heaviest aircraft in the fleet, less 0.5% of the Maximum Landing Weight.

2.2 If a Fleet Mean Weight is used, a weight control system should be established to account for modifications and repairs. Where there is a weight increase greater than 0.2%, the Director-General should be informed in order to consider the validity of the established Fleet Mean Weight.

2.3 Where the weight of an aircraft differs significantly from the remainder of the fleet it is acceptable to exclude this from the fleet. Separate fleets may be established each with differing Fleet Mean Weights.
2.4 To establish a Fleet Mean Weight for an existing fleet of aircraft to which will be added other aircraft of the same type, the new Fleet Mean Weight should be based on an up-to-date sample in accordance with the sampling procedures (see paragraph 3) drawn in proportion to the relative sizes of the original fleet and the additional aircraft.

3 PERIODICAL SAMPLING PROCEDURES

3.1 The number of aircraft to be weighed each year is:

<table>
<thead>
<tr>
<th>Number in Fleet</th>
<th>Number to be Weighed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4 and 5</td>
<td>4</td>
</tr>
<tr>
<td>6 and 7</td>
<td>5</td>
</tr>
<tr>
<td>8 to 13</td>
<td>6</td>
</tr>
<tr>
<td>14 to 23</td>
<td>7</td>
</tr>
<tr>
<td>24 and over</td>
<td>6 plus 10% of the number of aircraft over 9</td>
</tr>
</tbody>
</table>

3.2 The number of samples may be reduced, by prior agreement with the Director-General, where it can be shown that the variation in fleet weights is not significant from year to year.

3.3 Periodical sample weighings should be made in accordance with paragraph 3.1 from those aircraft in the fleet which show the greatest elapsed time between weighings.

4 FLEET MEAN CENTRE-OF-GRAVITY POSITION

This should be established by using the same appropriate procedures as for the Fleet Mean Weight, except that an aircraft with a Centre-of-Gravity position greater than 0.5% standard mean chord (SMC) from the Fleet Mean Centre-of-Gravity Position should not be included in the fleet.
SECTION 1.6

SUB-SECTION 1.6-5

MINIMUM EQUIPMENT LISTS

1. INTRODUCTION

1.1 Article 14A of the AN(HK)O prescribes that an aircraft registered in Hong Kong shall not commence a flight if any of the equipment required by or under the said Order to be carried in the circumstances of the intended flight is not carried or is not in a fit condition for use unless the aircraft does so under and in accordance with the terms of a permission granted under this Article.

1.2 The permission granted by the Director-General to operators states that the only items of required equipment which are not carried or are not in a fit condition for use shall be listed in the respective aircraft Minimum Equipment List (MEL) duly approved by the Director-General and it is provided in the said MEL that such items need not be carried or be in a fit condition for use in the circumstances of the intended flight.

1.3 The MEL shall be prepared by the operator and shall be no less restrictive than the relevant MMEL for the same aircraft type approved by the Director-General (see CAD 549 HKAR-MMEL/MEL).

1.4 Unless otherwise determined by the Director-General the format in which the MEL is to be presented should conform to that prescribed in CAD 549 HKAR-MMEL/MEL.

2 APPLICABILITY

This requirement is applicable to any aircraft for which a Certificate of Airworthiness (C of A) is in force or for which an application for issue of a C of A has been made, and which has a MTWA exceeding 2730 kg, with the exception of those certification in the Special Category, unless otherwise determined by the Director-General.

3 SUBMISSION OF MEL

Issue 2  1.6-5 P.1  31 January 2009
MELs must be submitted to the Airworthiness Office at the time of an application for an Air Operator Certificate (AOC). See CAD 360 Air Operator’s Certificates Requirements Document Part One for details.

4 CHARGES

The charges for the investigation of the MEL will form an integral part of the charges levied for the issue or renewal of the AOC.

5 APPROVAL OF THE MEL

Detailed requirements for the approval of a MEL are contained in CAD 549 HKAR-MMEL/MEL. Following investigation by the Director-General, approval of the MEL will be signified to the operator by means of the issue of an approval letter.

6 AMENDMENT OF MEL

6.1 Amendment of a MEL will be required in all cases where the MMEL has been amended such that it becomes more restrictive.

6.2 When a normal MMEL revision for a specific aircraft type is issued, an operator will have 90 days from the date of receipt of the revision to revise the MEL. Reduced time scales for implementation of safety related revisions may be required.

6.3 The amendment of the MEL to reflect an already approved change to the MMEL which is less restrictive will be at the discretion of the operator.
SECTION 1.6

SUB-SECTION 1.6-6

MANDATORY MODIFICATIONS, INSPECTIONS AND CHANGES TO APPROVED DOCUMENTATION:
PROCEDURE FOR IMPLEMENTATION

INTRODUCTION

1.1 Modifications and inspections, considered essential for airworthiness, will be classified as mandatory by the Director-General in consultation, where appropriate, with the approved organisation, and the compliance date, limiting flying hours, cycles, or details when the prescribed action must be taken, will be decided. In making this decision the degree of urgency and availability of modified parts will be taken into account.

1.2 An Airworthiness Directive (AD) is a document issued or adopted by the Authority of the State of Registry of an aircraft which mandates the actions to be performed to restore an acceptable level of safety to an aircraft when an unsafe condition has been identified. The corrective action can include any of the following and be addressed against the aircraft, engine, propeller, part or appliance:
   • repair;
   • removal from service;
   • design change;
   • inspection;
   • change to the limitations or procedures associated with a product or equipment (Aircraft Flight Manual, life limits, Certification Maintenance Requirements etc.).

NOTE: Where the term 'product' is used in this Sub-section it includes aircraft, engines and propellers and the term 'equipment' includes parts and appliances.

1.3 ‘Non-CAD AD’ means an AD (including Emergency AD (EAD)) or mandatory airworthiness requirement issued by a civil aviation authority outside Hong Kong which mandates actions to be performed to restore an acceptable level of safety for aircraft, when evidence shows that the safety level may otherwise be compromised.

1.4 The provisions of Article 8(7) of the Air Navigation (Hong Kong) Order 1995 (‘the Order’) are such that a Certificate of Airworthiness (C of A) issued in respect of an aircraft registered in Hong Kong will cease to be in force until any modification or inspection, being a modification or inspection required by
1.6 For the purpose of compliance with Articles 8(7) and 62(4), a modification, inspection or change to approved documentation required by the Director-General is one which has been so classified as mandatory or issued as an AD, by the Director-General. An AD is the means by which mandatory status is conferred on any modification, inspection, repair, life limit, or approved documentation.

1.7 In certain instances, requirements for mandatory modifications, inspections and changes to approved documentation are issued in respect of engines, propellers and equipment manufactured by one ICAO Contracting State fitted to aircraft designed by another ICAO Contracting State on the Hong Kong register. Owners/operators are therefore reminded to ensure the total requirements for a complete aircraft including its engines, propellers and equipment have been reviewed and complied with.

1.8 If, in the course of work connected with matters dealt with in this Sub-section, the owners/operators become aware of any potential airworthiness problems they should, without delay, advise the Director-General.

2 MANDATORY MODIFICATIONS AND INSPECTIONS

2.1 The mandatory modifications and inspections required to be complied with on an aircraft depend upon the certification basis (airworthiness standards) of that particular aircraft, upon which the Hong Kong C of A is issued. The Hong Kong certification basis of the aircraft is prescribed in the associated Hong Kong Type Certificate Data Sheet. There could be Hong Kong registered aircraft of the same aircraft type but issued with C of A based upon different certification basis. The Director-General adopts the following non-CAD AD unless notification by the Director-General is made to the contrary:

2.1.1 For aircraft with Hong Kong certification basis based upon the design standards issued by the State of Design, the Director-General adopts the non-CAD AD issued by the State of Design.
2.1.2 For aircraft with Hong Kong certification basis based upon the design standards issued by other than the State of Design, the Director-General adopts the non-CAD AD issued by the Civil Aviation Authority who issues the design standards.

2.1.3 Notwithstanding subparagraph 2.1.2, for aircraft with Hong Kong certification basis based upon the European Joint Aviation Requirements (JAR), the Director-General adopts the non-CAD AD issued by the State of Design.

2.1.4 For engines, propellers and equipment, the Director-General adopts the non-CAD AD issued by the State of Design.

NOTE: For products designed in EU States the AD of the States of Design issued prior to 28 September 2004 are adopted by EASA. AD issued after 28 September 2003 for products of EU design are published as AD approved directly by EASA.

2.2 Modifications and inspections prescribed in Hong Kong Airworthiness Notices (HKAN) of mandatory character are classified as mandatory by the Director-General.

3. WORK AND CERTIFICATIONS

3.1 Work undertaken in incorporating a mandatory modification, or in carrying out a mandatory inspection, shall be supervised by an organisation approved by the Director-General for the purpose (see Sub-section 1.8 and HKAR-145) or by an appropriately licensed aircraft maintenance engineer.

3.2 Full particulars of the work done to incorporate the modification, or details, results and work arising from the mandatory inspection, shall be entered in the appropriate log book, quoting the reference number of the appropriate document, e.g. Airworthiness Approval Note for a Major modification, Service Bulletin for a mandatory inspection. A Certificate of Release to Service shall be completed, where appropriate, and attached thereto.

3.3 All relevant records of mandatory modifications and inspection shall be made available to the Director-General for examination on request, and these shall not be destroyed without authorisation from the Director-General.

NOTE: The Order requires that log books, and other documents which are identified and referred to in the log books (therefore forming part of the log books) shall be preserved until a date two years after the aircraft, the engine or the variable pitch propeller, as the case may be, has been destroyed, or permanently withdrawn from use.
4. **RESPONSIBILITY OF OWNERS/OPERATORS AND INDIVIDUALS/ORGANISATIONS CARRYING OUT MAINTENANCE AND OVERHAUL**

4.1 In order to ensure that an aircraft is in compliance with any applicable requirements classified as mandatory by the Director-General, it is incumbent on the owners/operators to ensure that they are aware of the mandatory requirements where applicable as stated in paragraph 2, and any other continued airworthiness requirements (Service Bulletins, Technical News Sheets, etc.) concerning mandatory modifications, inspections or changes to approved documentation in respect of their aircraft including its engines, propellers, radio, accessories, instruments, equipment and performance documents, and to act accordingly.

*NOTE: The owners/operators are advised to institute a procedure for the assessment of published service information in order to ensure that an adequate and timely response will be made.*

4.2 In addition, organisations or individuals undertaking maintenance and overhaul must also ensure that they are in receipt of the data prescribed in paragraph 4.1, where applicable, for the products which they maintain or overhaul.

4.3 It is the owners/operators’ responsibility to monitor the AD and EAD adopted by the Director-General and HKAN as stated in paragraph 2. The documents are published in following websites:

<table>
<thead>
<tr>
<th>Document</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>i HKAN</td>
<td><a href="http://www.cad.gov.hk/english/HKAN.html">http://www.cad.gov.hk/english/HKAN.html</a></td>
</tr>
<tr>
<td>ii EASA AD/EAD</td>
<td><a href="https://ad.easa.europa.eu/">https://ad.easa.europa.eu/</a></td>
</tr>
<tr>
<td>iii FAA AD/EAD</td>
<td><a href="https://www.faa.gov/regulations_policies/airworthiness_directives/">https://www.faa.gov/regulations_policies/airworthiness_directives/</a></td>
</tr>
</tbody>
</table>

4.4 To receive notifications of new AD, EAD or HKAN, subscriptions may be made using the following methods:

<table>
<thead>
<tr>
<th>Authority</th>
<th>Subscription Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>i HKCAD</td>
<td>Send email to <a href="mailto:awoan@cad.gov.hk">awoan@cad.gov.hk</a></td>
</tr>
<tr>
<td>ii EASA</td>
<td><a href="https://hub.easa.europa.eu/security/?app=awd&amp;act=register">https://hub.easa.europa.eu/security/?app=awd&amp;act=register</a></td>
</tr>
<tr>
<td>iii FAA</td>
<td><a href="https://public.govdelivery.com/accounts/USFAARG/subscriber/new?pop=t">https://public.govdelivery.com/accounts/USFAARG/subscriber/new?pop=t</a></td>
</tr>
<tr>
<td>iv TCCA</td>
<td><a href="http://wwwapps.tc.gc.ca/Comm/5/ListServ/Lg.aspx?lang=eng">http://wwwapps.tc.gc.ca/Comm/5/ListServ/Lg.aspx?lang=eng</a></td>
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5. REPETITIVE INSPECTION

5.1 Non Commercial Air Transport

5.1.1 Where an AD has a repetitive periodicity of not exceeding 24 hours elapsed time the Director-General may invoke the authorisation detailed in paragraph 5.1.3. If invoked, the text of the AD will prescribe the authorisation.

5.1.2 When an AD is classified as mandatory in accordance with paragraph 2, and has the following or similar clauses in the text:-

(a) a repetitive inspection periodicity of not exceeding 24 hours elapsed time.

(b) a clause/paragraph which allows the pilot to carry out the inspection;

the authorisation contained in paragraph 5.1.3 may be used.

5.1.3 The Director-General in exercise of his powers under Article 11(6)(d) of the Order hereby authorises, a pilot, as a person competent to issue a Certificate of Release to Service in respect of a mandatory inspection required by an AD where the inspection recurs at periods not exceeding 24 hours elapsed time, subject to the following conditions:-

(a) The pilot must hold a Group or Type rated licence applicable to the type quoted in the inspection.

(b) The pilot must have sufficient technical knowledge and have received specific training to provide that person with the competence to accomplish the inspection which may also require the use of simple visual inspection aids.

(c) The specific training must be provided by an appropriately licensed aircraft maintenance engineer or organisation approved by the Director-General for that purpose.

5.1.4 When certifying an inspection in accordance with paragraph 5.1.3 the certifying signature will be that of the pilot followed by his or her licence number.
5.2 Commercial Air Transport

5.2.1 The provisions of paragraph 5.1 above cannot be used for repetitive inspections on aircraft operated for Commercial Air Transport. All certifications must be made by persons authorised by an organisation approved under HKAR-145.

5.2.2 Refer to HKAR 145.30(j)(2) for the requirements of repetitive pre-flight AD inspection which specifically states that flight crew may carry out such inspection.

5.2.3 When certifying an inspection in accordance with paragraph 5.2.2, the certifying signature will be that of the authorisation reference issued by the HKAR-145 organisation.

6. CHANGES TO FLIGHT MANUALS OR PERFORMANCE SCHEDULES

6.1 Where an AD introduces a change to an aircraft Flight Manual or Performance Schedule, the introduction of the change into the appropriate document shall be the responsibility of the owner/operator of the aircraft. A copy of the AD shall be attached to the Flight Manual or Performance Schedule to denote compliance in addition to any manufacturer's temporary revisions complementary to the AD.

Note: In addition to introducing a copy of the AD into the Flight Manual, owners/operators must ensure where a 'Permission' has been granted to utilise an Operations Manual in lieu of the Flight Manual, that the information promulgated in the AD is transmitted into the Operations Manual within the compliance time specified in the AD.

6.2 Where it is necessary to amend the particulars in the Certificate of Airworthiness or Flight Manual, the Certificate or Manual shall, unless agreed otherwise by the Director-General, be returned to the CAD Airworthiness Office for renewal and approval.

7. ALTERNATIVE MEANS OF COMPLIANCE (AMOC)

7.1 An applicant for the approval of an AMOC to that specified in an AD or a non-CAD AD shall submit a request to the Director-General containing at least the following information:

(a) The make, model, and serial number of the aircraft or aircraft component to which the AD or non-CAD AD applies; and
(b) In the case of an aircraft to which an AD or a non-CAD AD applies, its registration markings; and

(c) The name and address of the applicant; and

(d) The identification of the AD or non-CAD AD for which the AMOC is sought; and

(e) Substantiating data to demonstrate that a level of safety equivalent to that of the AD or non-CAD AD, as the case may be, can be achieved by the proposed AMOC; and

(f) A risk assessment analysis; and

(g) Such further particulars as the Director-General may require relating to the aircraft or aircraft component, or the approval of an AMOC.

7.2 The Director-General may approve an AMOC if the Director-General is satisfied that the AMOC provides an equivalent level of safety to that achieved through compliance with the requirements in the AD or non-CAD AD.

7.3 Variation to AD Compliance Timescale

7.3.1 Aircraft owners/operators and contracted maintenance organisations must assess all AD relating to relevant aircraft types and initiate early requisition and/or provision of aircraft parts and/or maintenance resources to meet the AD compliance timescale.

7.3.2 Any application to vary an AD compliance timescale will be assessed by the Director-General on a case by case basis. The applicant, normally supported by the organisation responsible for the type design, must demonstrate, to the satisfaction of the Director-General, an equivalent level of safety. Variations of this nature are intended to be used in exceptional circumstances which could not reasonably have been foreseen by the owner/operator or contracted maintenance organisation.

7.4 Acceptance of Non-CAD AMOC

7.4.1 Product type specific AMOC issued by the EASA or the FAA as the primary certification authority for the product type is adopted by the Director-General.

7.4.2 Approval of product/equipment serial number specific AMOC may be delegated to Design Organisation approved under HKAR-21 Subpart J via CAD approved company procedures. The AMOC is limited to a single
application to a specific repair with product/equipment serial number specific. The delegated AMOC shall be supported by a corresponding AMOC issued by the EASA or the FAA as the primary certification authority for the concerned product/equipment.
SECTION 1.6

SUB-SECTION 1.6-7

CERTIFICATION OF INSPECTIONS, OVERHAULS, MODIFICATIONS, REPAIRS AND REPLACEMENTS

1 INTRODUCTION

In accordance with the Air Navigation (Hong Kong) Order 1995 (AN(HK)O), an aircraft registered in Hong Kong, being an aircraft in respect of which a Certificate of Airworthiness issued or rendered valid under the AN(HK)O is in force, shall not fly unless there is in force a Certificate of Release to Service issued in respect of any overhauls, repairs, replacements, modifications, maintenance, mandatory inspections or scheduled maintenance inspections to the aircraft or any part of the aircraft or such of its equipment as is necessary for the airworthiness of the aircraft. In addition, a Certificate of Release to Service is required for all such work carried out on radio equipment and equipment specified in Schedule 6 of the AN(HK)O. Certain exclusions are identified in paragraph 3.1. This Sub-section 1.6-7 concerns inspections, overhauls, modifications, repairs and replacements applicable to aircraft and, where appropriate, to components, engines, propellers, radio apparatus, accessories, instruments, equipment, their installations and the issue of Certificates of Release to Service thereto.

NOTE: Owners, operators, and organisations undertaking overhaul/maintenance on aircraft should ensure that the constructor of each type of aircraft is informed of their names and addresses to facilitate distribution of the documents notifying mandatory modifications and inspections.

2 INSPECTIONS, OVERHAULS, MODIFICATIONS, REPAIRS AND REPLACEMENTS

2.1 General

2.1.1 Inspections, overhauls, modifications, repairs, and replacements shall be carried out in accordance with the approved manuals, drawings and schedules related thereto, and any other documents required or recognised, by the Director-General.
2.1.2 Further, in the case of structural repairs to an aircraft, where the repairs are of a major nature, or not covered in the particular approved manual, the approved organisation or the appropriately licensed aircraft maintenance engineer concerned, shall advise the Director-General of the nature of the repairs before the work commences (See Hong Kong Airworthiness Notice No. 29 for address information). Repair schemes, not previously approved by the Director-General, will be investigated as modifications in accordance with the procedures in HKAR-1 Sub-section 1.2-5.

2.1.3 Replacement parts shall be certified by an organisation approved by the Director-General for the purpose, or by an alternative procedure agreed by the Director-General.

2.2 Work and Certifications

2.2.1 Inspection, overhaul, modification, repair, and replacement work shall be supervised by an organisation approved by the Director-General for the purpose (see HKAR-1 Section 1.8 or HKAR-145) or by an appropriately licensed aircraft maintenance engineer.

2.2.2 Where the work is to be carried out on an aircraft registered in Hong Kong by an organisation located outside Hong Kong not approved by the Director-General, suitable arrangements shall be agreed with the Director-General (see paragraph 7).

2.2.3 Depending on the nature of the overhaul, modification, repair, or replacement made to the aircraft, the following may be required by the Director-General:

(a) The aircraft to be weighed, and an amended Weight and Centre-of-Gravity Schedule, or its equivalent as prescribed in HKAR-1 Sub-section 1.7-10 to be prepared.

(b) A Certificate of Fitness for Flight issued (See HKAR-1 Sub-section 1.3-8) and the aircraft to be tested in flight to schedules approved by the Director-General in accordance with HKAR-1 Sub-section 1.6-8.

2.2.4 Before a Certificate of Release to Service or its equivalent is issued, the work shall have been inspected, and tested where necessary, in conformity with the specifications, drawings and instructions relating
to the modification or mandatory inspection. Where appropriate, the instructions shall include a copy of the original Airworthiness Approval Note for a major modification, or a copy of the CAD Form DCA 261 for a minor modification.

2.2.5 The aircraft shall be made available to enable the Director-General to inspect it as necessary.

2.2.6 When the work has been fully inspected, and tested where necessary, for conformity with the specifications, drawings and instructions relating to the overhaul, modification, repair or replacement, the necessary certification and, where appropriate, log book entries shall be completed in accordance with paragraph 5. Where applicable the instructions shall include a copy of the original Airworthiness Approval Note for a major modification, or a copy of the CAD Form DCA 261 for a minor modification. Where the work has been carried out by an organisation, in accordance with paragraph 2.2.2, the organisation for whom the work has been carried out shall raise a Certificate of Release to Service where such is required, using a suitable certificate supported by the Responsible Authority of the State concerned, as evidence that an acceptable standard has been achieved.

3 CERTIFICATES OF RELEASE TO SERVICE

NOTE: Certificate of Release to Service for aircraft with either a Transport Category (Passenger) or Transport Category (Cargo) Certificate of Airworthiness and when used for Commercial Air Transport shall be in accordance with HKAR-145.

3.1 A Certificate of Release to Service shall be issued after overhauls, repairs, replacements, modifications and mandatory inspections have been carried out on an aircraft, which is registered in Hong Kong and has a Certificate of Airworthiness in force, except as follows:-

NOTE: Mandatory inspections, for the purpose of this Sub-section 1.6-2, are those inspections classified as mandatory by the Director-General, where the inspection itself is the work.

(a) A Certificate of Release to Service is not required for certain prescribed repairs or replacement carried out on an aircraft not exceeding 2730 kg Maximum Total Weight Authorised with a Certificate of Airworthiness in the Private or Special Categories, provided the work has been carried out personally by the owner or
operator holding a pilot's licence. Details of the prescribed repairs or replacements permitted are contained in the Air Navigation (General) Regulations.

(b) If a repair or replacement of a part of an aircraft or its equipment is carried out when the aircraft is at such a place that it is not reasonably practicable (i) to carry out the work in a manner that a Certificate of Release to Service can be issued, or (ii) for the Certificate to be issued at that particular place, the Commander may fly the aircraft, if, in his opinion, it is safe to do so, to the nearest place at which a Certificate can be issued.

NOTE: The AN(HK)O prescribes that in such cases written particulars of the flight and the reasons for making it are to be given to the Director-General within ten days thereafter.

(c) A Certificate of Release to Service is not required for any overhaul, repair, inspection or modification, carried out on items specified in the AN(HK)O, Schedule 5, paragraph 3.

3.2 A Certificate of Release to Service shall only be issued for a particular inspection, overhaul, modification, repair or replacement when the signatory is (signatories are) satisfied that the work has been properly carried out, having due regard to the use of:-

(a) up-to-date and approved airworthiness data including manuals, drawings, specifications, mandatory modifications/inspections and where applicable, company procedures,

(b) recommended tooling and test equipment which is currently calibrated where applicable, and

(c) a working environment appropriate to the work being carried out.

3.3 The Certificate of Release to Service shall contain particulars of the work done or the inspection completed and the organisation and place at which the work was carried out. Depending upon the application of the certificate, details of the aircraft type, registration, component type, part number and serial number shall be recorded as applicable. The certification shall be worded in one of the following manners:-

For certifications made other than by Organisations approved in accordance with HKAR-145
'The work recorded above has been carried out in accordance with the requirements of the Air Navigation (Hong Kong) Order for the time being in force and in that respect the aircraft/equipment is considered fit for release to service.'

For certifications made by Organisations approved in accordance with HKAR-145

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

NOTE: The above statement means that the signatory certifies (signatories certify) the work specified in the manufacturer’s or 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., except as otherwise specified in the deferred items, was carried out in accordance with HKAR-145 and in respect to that work the aircraft/aircraft component is considered ready for release to service. The above interpretative material is not exhaustive. For further details, reference should be made to HKAR-145 AMC145.50(b).

NOTE: For organisations approved in accordance with HKAR-145, the certification may be issued in accordance with procedures specified in the Maintenance Organisation Exposition.

3.4 The Authorised Release Certificate identified as CAD Form One (see Appendix No. 1 to Hong Kong Airworthiness Notice No. 17) for Hong Kong constitutes the aircraft component Certificate of Release to Service when an aircraft component is maintained by one HKAR-145 organisation for another HKAR-145 organisation.

3.5 The Certificate of Release to Service shall be signed by a person specified in paragraph 4 except that the Director-General may direct which of these persons shall sign in a particular case. The signatory/signatories shall record licence/approval/authorisation reference number as appropriate, together with the date.

4 CERTIFICATION OF RELEASE TO SERVICE SIGNATORIES

4.1 A Certificate of Release to Service shall be issued only by one of the following:-

(a) The holder of an aircraft maintenance engineer's licence granted
under the AN(HK)O, being a licence which entitles the holder to issue that certificate.

(b) The holder of an aircraft maintenance engineer's licence granted under the law of a country other than Hong Kong and rendered valid under the AN(HK)O, in accordance with the privileges endorsed on the licence.

(c) The holder of an aircraft maintenance engineer's licence or authorisation as such an engineer granted or issued by or under the law of any Contracting State other than Hong Kong in which the overhaul, repair, replacement, modification or inspection has been carried out, but only in respect of aircraft of which the Maximum Total Weight Authorised does not exceed 2730 kg and in accordance with the privileges endorsed on the licence.

NOTE: 'Contracting State' means any State which is a party to the Convention on International Civil Aviation at Chicago on 7th December 1944.

(d) A person, approved by the Director-General as being competent to issue such Certificates, and in accordance with that approval.

(e) A person whom the Director-General has authorised to issue the Certificate in a particular case, and in accordance with that authority.

(f) In relation only to the adjustment and compensation of direct reading magnetic compasses, the holder of an Airline Transport Pilot's Licence (Aeroplanes) or a Flight Navigator's Licence granted or rendered valid under the AN(HK)O may also issue a Certificate of Release to Service.

5 RETENTION OF RECORDS

5.1 When all the relevant work has been carried out, a Certificate of Release to Service shall be entered in/attached to the appropriate log book and signed by authorised persons.

(a) Where it is more convenient, the required particulars may be entered in a separate record, but an entry shall be made in the appropriate log book, containing a summary of the work carried out and a cross-reference to the document containing the Certificate of Release to Service.
(b) Where an alternative record system has been agreed then the format and location of such Certificates shall be in accordance with that agreement.

(c) Where work has been carried out in accordance with the provision of paragraph 3.1 (b) then the details of such work together with date, pilot’s licence number and signature of the person who carried out the work shall be entered in the appropriate log book.

5.2 Full particulars of work done to incorporate modifications shall be entered in the appropriate log book, quoting the reference number of the appropriate document, e.g. Airworthiness Approval Note for a major modification, Service Bulletin for a mandatory inspection. A Certificate of Release to Service shall be issued, where appropriate, and attached thereto (see paragraph 2.2.6).

5.3 When it is more convenient, the information required by paragraph 5.2 may be entered in a separate record which shall be certified in the same manner as that required for entry in the appropriate log book. The reference number of this record, and the place where it may be examined, shall be entered in the log book under a brief description of the particular modification. A similar record shall be kept when log books are not required.

5.4 All relevant records of mandatory inspections, overhauls, modifications, repairs and replacements shall be made available to the Director-General for examination on request, and these shall not be destroyed without authorisation from the Director-General.

NOTE: The AN(HK)O requires that log books, and other documents which are identified and referred to in the log books (therefore forming part of the log books) shall be preserved until a date two years after the aircraft, the engine or the variable pitch propeller, as the case may be, has been destroyed or has been permanently withdrawn from use.

6 MANUALSES

6.1 Amendments to Manuals, i.e. the Flight Manual (see HKAR-1 Sub-section 1.7-2), Maintenance, Overhaul and Repair Manuals (see HKAR-1 Sub-section 1.7-4) or the Crew Manual (see HKAR-1 Sub-section 1.7-3) or the Maintenance Schedule (see HKAR-1 Sub-section 1.7-5) arising from the incorporation of a major or minor modification in an aircraft shall be made
in accordance with the requirements of the particular Sub-sections. In the case of minor modifications approved under CAD Form DCA 261 procedure the applicant shall submit details of the proposed amendments to the Director-General for approval.

6.2 Where it is necessary to amend the particulars in the Certificate of Airworthiness or Flight Manual, the Certificate or Manual shall, unless agreed otherwise by the Director-General, be forwarded to the CAD Airworthiness Office.

7 WORK BY ORGANISATIONS LOCATED OUTSIDE HONG KONG NOT APPROVED BY THE DIRECTOR-GENERAL

7.1 Where the Director-General has entered into a special arrangement with a country, the supervision and associated release documentation should follow the terms of that agreement.

7.2 In the absence of a special arrangement in accordance with 7.1, 7.2.1 or 7.2.2 may be applied.

7.2.1 Where the airworthiness arrangements in the country achieve a standard acceptable to the Director-General, work may be accepted from organisations within that country provided it is accompanied by a suitable certificate supported by the Responsible Authority of the State concerned. The type of work, detail arrangements and form of certification required should be agreed in consultation with the Director-General.

7.2.2 Work from other organisations not covered by 7.2.1 may be accepted on an ad hoc basis, and the arrangements should be agreed, case by case, with the Director-General.
SECTION 1.6

SUB-SECTION 1.6-8

FLIGHT TESTING AFTER MODIFICATION OR REPAIR

1 GENERAL

1.1 The flight testing of aircraft shall comply with the procedures set out in this Sub-section 1.6-8, as follows:-

(a) Modifications to aircraft and Variants under investigation for the issue of a Certificate of Airworthiness or a Permit to Fly.

(b) Aircraft which have undergone structural repairs which could affect their flight characteristics.

NOTE: All owners are required to ensure that insurance policies covering damage to their aircraft and to third parties are suitably endorsed to cover flights by the CAD Approved Test Pilots.

1.2 In order that the Director-General may accept reports on flight test matters, the qualifications and experience of personnel involved in flight testing under the provisions of this Sub-section shall be acceptable to the Director-General. The pilots or flight crew shall be appropriately licensed for the particular type of aircraft concerned and competent to conduct the test laid down in the Airworthiness Flight Test Schedule.

1.3 Except where the Director-General requires additional pilots or flight crew to be carried out for a particular Airworthiness Flight Test, the number of persons conducting the test should be confined to the crew specified in the Certificate of Airworthiness (flight manual).

1.4 Flight test personnel shall be provided with adequate facilities and equipment for the effective performance of their duties.

NOTE: Organisations approved in accordance with Sub-section 1.8-9 to fly aircraft under 'B' Conditions of the Air Navigation (Hong Kong) Order 1995 comply with this requirement.

2 MODIFICATIONS AND REPAIRS TO AIRCRAFT AND VARIANTS

2.1 The requirements and procedures of this paragraph 2 are applicable:-
HKAR-1

(a) In respect of modifications to aircraft.

(b) In respect of repairs to aircraft.

2.2 If in the opinion of the Director-General, the design of an aircraft is so modified as to affect the flight characteristics or the functioning in flight of the aircraft, the Director-General may decide that a flight test evaluation is required; in which case the procedures of Sub-section 1.2-3 shall be followed, except where any part is clearly inapplicable. The schedule of flight testing shall include:

(a) The flight tests necessary to re-establish compliance with the appropriate airworthiness requirements.

(b) The flight tests necessary to provide new or revised information for inclusion in the documents associated with the Certificate of Airworthiness (or Permit to Fly).

(c) Flight tests as contained in the approved Airworthiness Flight Test Schedule for an aircraft of the basic type concerned (Sub-section 1.3-3) except where these tests are covered by the tests referred to in (a) and (b).

2.3 Where no specific flight test evaluation is required, the aircraft shall be flight tested as a Series aircraft in accordance with Sub-section 1.3-3.
Section 1.7

Procedures for the Approval of Documents and Manuals for Operation and Maintenance of Aircraft
SECTION 1.7

SUB-SECTION 1.7-2

FLIGHT MANUALS

1  INTRODUCTION

1.1 A Flight Manual is a document prescribed by the International Civil Aviation Organisation and is intended primarily for use by the flight crew. The Manual contains limitations, recommended procedures and information of a nature such that adherence to it will enable the level of safety which is intended by the Airworthiness Requirements and the Air Navigation legislation to be regularly achieved. The Flight Manual, by definition in the Air Navigation (Hong Kong) Order 1995, forms part of the Certificate of Airworthiness. A Configuration Deviation List (CDL), if compiled, should contain the contents as specified in the paragraph 4.

NOTES: (1) The requirements of this Sub-section do not apply to aircraft of which the Prototype was certificated before 5th April 1949.

(2) In this Sub-section, the term 'Flight Manual' includes any documents accepted in place of a Flight Manual.

1.2 Flight Manuals and amendments thereto shall be approved, amended, and published in accordance with the procedures set out in this Sub-section 1.7-2.

2  AIRCRAFT FLIGHT MANUAL

2.1 Applicability

The requirements and procedures of this Sub-section 1.7-2 are applicable to Flight Manuals which are required to be provided as part of the certification documentation of a type of aircraft new to Hong Kong and to new Flight Manuals for Variants or Series aircraft for which an application has been made for a Hong Kong Certificate of Airworthiness.

2.1.1 In respect of aircraft the Maximum Total Weight Authorised of which does not exceed 2730 kg, a Flight Manual need not be supplied provided that:-

(a) A Flight Manual is not prescribed as a mandatory part of the
Certificate of Airworthiness by the Responsible Authority of the State of Origin of the aircraft, and

(b) The limitations, procedures and information necessary for the operation of the aircraft in accordance with the Air Navigation (Hong Kong) Order 1995 are promulgated in an acceptable document other than a Flight Manual.

2.2 General

Flight Manuals and all amendments thereto shall be subject to acceptance or approval, as appropriate, by the Director-General.

2.2.2 Flight Manuals provided in compliance with this paragraph 2 shall be approved in accordance with procedures acceptable to the Responsible Authority of the State of Origin of the aircraft (hereinafter referred to as the 'Responsible Authority'), and in addition shall comply with any Special Conditions prescribed by the Director-General.

NOTE: It is the usual practice for Flight Manuals to be prepared and published by the constructor*, but a Manual prepared and published by some other body* will be acceptable provided that it complies with paragraph 2.2.2.

(*) Hereinafter referred to as the Originator of the Manual.

2.2.3 Procedures shall be established by the applicant to ensure that the flight manual is updated by incorporating the amendments, including changes classified as mandatory by the Director-General; or in case of an aircraft leased to a Hong Kong operator, classified as mandatory by the State of Registry.

2.2.4 For Flight Manuals provided in compliance with this paragraph 2, the applicant shall be responsible for, and shall make the necessary arrangements to ensure, the supply of any amendments which are necessary to keep the Flight Manual up to date for as long as an aircraft of the type remains registered in Hong Kong (see paragraph 2.4).

2.2.5 Flight Manuals provided in compliance with this paragraph shall be in the English language.

2.3 Acceptance and Publication of Initial Manual

2.3.1 The Director-General will, after taking account of the size and
complexity of the aircraft, advise the applicant of the timetable for approving the Flight Manual.

2.3.2 The Flight Manual shall be identified either by a unique reference number, or by the exact designation of all the aircraft to which the Manual is to apply.

2.3.3 One copy of the Flight Manual shall be supplied to the CAD Airworthiness Office for examination and acceptance in accordance with the agreed timetable.

2.3.4 When the Director-General has completed his examination of the Flight Manual, the applicant will be notified of the acceptance or of any alterations to it which are considered necessary prior to such acceptance.

2.3.5 When the Flight Manual is acceptable to the Director-General, one copy in the final form shall be sent to the CAD Airworthiness Office for retention.

2.4 Acceptance or Approval and Publication of Amendment

The procedure for the amendment of Flight Manuals accepted and published in accordance with paragraph 2.3 shall be in accordance with this paragraph 2.4.

2.4.1 The applicant shall supply such amendment material as is necessary to maintain compliance with paragraph 2.2.4, and shall indicate to which aircraft the proposed amendments are applicable.

2.4.2 Amendments which are initiated by the Originator of the Manual and already approved by the Responsible Authority are accepted by the Director-General and shall be proceeded in accordance with this paragraph.

(a) One copy of the approved amendments shall be sent to the CAD Airworthiness Office.

(b) The investigation by the Director-General will normally be limited to the extent necessary to ensure that the amendments are consistent with:

(i) The basis upon which the type of aircraft was
certificated.

(ii) Current Hong Kong Air Navigation legislation.

(c) Change Sheets or Supplements to the amendments may be initiated by the Director-General if necessary.

2.4.3 Changes which are initiated by an applicant other than the Originator of the Manual or the Director-General shall be processed and approved in accordance with paragraph 2.4.4, and shall be effected either by means of a Change Sheet or by a Supplement.

(a) Each Change Sheet or Supplement shall, unless agreed otherwise by the Director-General, be produced by, and shall be submitted for approval through, the medium of an organisation approved for the purpose, and shall comply with the appropriate requirements.

NOTES: (1) Where the amendment involves the copying of a previously approved amendment or alterations to reflect changes of relatively small significance, material may be accepted from suitable organisations not formally approved by the Director-General.

(2) A Change Sheet, which consists of an additional page or pages, is normally used to cover simple changes to existing data. It is embodied in the Flight Manual adjacent to the basic page to which the change relates.

(3) A Supplement is normally used to introduce a new role for the aircraft or the installation of major items of equipment.

2.4.4 The requirements of this paragraph 2.4.4 are applicable to amendments initiated in accordance with paragraph 2.4.3.

(a) One copy of the proposed amendments shall be sent to the Director-General for approval, at least three weeks in advance of the desired date for publication.

NOTE: In the respect of amendments already approved by the Responsible Authority, the investigation by the Director-General will normally be limited to the extent necessary to ensure that the amendments are consistent with:

(i) The basis upon which the type of aircraft was certificated.
(ii) Current Hong Kong Air Navigation legislation.

(b) The applicant shall make any alternations which the Director-General may consider necessary at this stage.

(c) When the amendments have been approved by the Director-General, one copy of the amendments to be made to the Flight Manual of each particular aircraft, together with embodiment instructions, shall be sent by the Originator of the amendment or applicant, as appropriate, to the owner or operator of each aircraft affected, and the Director-General shall be informed when this has been done.

(d) One copy of the amendments as approved shall be supplied to the CAD Airworthiness Office for retention.

(e) The Operators shall, in accordance with the instructions provided, incorporate the amendments.

2.4.5 Series Aircraft

At least seven days before the date on which certification of a Series aircraft is desired, the applicant shall send to the Director-General, for examination, a copy of the Flight Manual relating to the aircraft; the manual to include Hong Kong registration marks and constructor's serial number. This copy shall include all applicable amendments embodied in accordance with paragraph 2.4.4. If the Flight Manual contains any material or amendments which have not previously been accepted or approved by the Director-General, the procedure of paragraph 2.4.4 shall be followed. When the Flight Manual has been examined and found to be satisfactory, it will be issued to the applicant with the Certificate of Airworthiness.

3 CERTIFICATE OF AIRWORTHINESS RENEWAL

The requirements concerning the Flight Manual at Certificate of Airworthiness renewal are prescribed in Sub-section 1.3-4.

4 CONFIGURATION DEVIATION LIST (CDL)

Operation of the aeroplane without certain secondary airframe and engines parts is allowed through the use of an approved CDL. The CDL should be included in the Flight Manual as a separate appendix. The following guidance should be followed.
when preparing the CDL.

4.1 The parts or combinations of parts permitted to be missing, together with the associated performance penalties and other limitations should be determined and presented in the same format as the Minimum Equipment List (MEL).

4.2 Unless it can be established that a zero or negligible performance degradation occurs as a result of a part missing from the aeroplane, a performance penalty should be presented for each part or for each combination of parts.

4.3 Performance penalties are normally presented as weight or percent weight decrements. Equivalent penalties expressed as other parameters are also acceptable. A single performance penalty applicable to all Flight Manual performance limitations may be presented for a missing part or, subject to certain restrictions, performance penalties may be presented for each phase of flight as follows:

(a) Only a single performance penalty for take-off and a single performance penalty for landing will be permitted. For take-off, the penalty shall be the most restrictive of the take-off field length, first, second and final segment climbs, and take-off flight path considerations. For landing, the penalty shall be the most restrictive of approach climb, landing climb, and landing distance considerations.

(b) Only a single weight penalty for en route climb performance, applying to both the one-engine-inoperative and two-engine-inoperative cases, as applicable, will be permitted.

(c) The CDL should contain the explanations of take-off performance penalty, landing performance penalty and en route performance penalty, as appropriate for the aeroplane, when individual penalties are used.

4.4 The following General Limitations should be presented in the CDL:

(a) When the aeroplane is operated using the CDL, it must be operated in accordance with the limitations specified in the Flight Manual, as amended in the CDL.

(b) The associated limitations must be listed on a placard affixed in the cockpit in clear view of the pilot in command and other appropriate
crew member(s).

(c) The pilot in command should be notified of each operation with a missing part(s) by listing the missing part(s) in the flight or dispatch release.

(d) The operator should list in the aeroplane logbook an appropriate notation covering the missing part(s) on each flight.

(e) If an additional part is lost in flight, the aeroplane may not depart the airport at which it landed following this event, until it again complies with the limitations of the CDL. This, of course, does not preclude the issuance of a ferry permit to allow the aeroplane to be flown to a point where the necessary repairs or replacements can be made.

(f) No more than one part for any one system may be missing, unless specific combinations are indicated in the CDL. Unless otherwise specified, parts from different systems may be missing. The performance penalties are cumulative, unless specifically designated penalties are indicated for the combination of missing parts.

(g) No more than three parts that have each been determined to cause a negligible performance degradation may be missing for take-off without applying a performance penalty. When more than three such parts are missing, a performance penalty of either 0.05 percent of the maximum take-off weight or 50 kg, whichever is less, must be applied for take-off, en route, and landing for each missing part.

(h) Take-off performance penalties should be applied to the take-off weights that are limited by performance considerations (i.e. take-off field length, first, second, or, final segment climb, or take-off flight path). If the performance limited take-off weight is greater than the maximum certified take-off weight, the take-off performance penalties should be applied to the maximum certified take-off weight to ensure compliance with the noise requirements.

(i) Landing performance penalties should be applied to the landing weights that are limited by performance considerations (i.e. landing field length, landing climb or approach climb). If the performance limited landing weight is greater than the maximum certified landing weight, the landing performance penalties should be applied to the maximum certified landing weight to ensure compliance with the noise requirements.
(j) En route performance penalties apply only to operations that are limited by the one- or two engine(s) inoperative en route climb performance.

(k) The numbering and designation of systems in the CDL is based on Air Transport Association (ATA) Specification 100. The parts within each system are identified by functional description and, when necessary, by part numbers.
SECTION 1.7
SUB-SECTION 1.7-3
CREW MANUALS

1 INTRODUCTION

Information and instructions necessary to enable the crew to acquire an understanding of the aircraft essential for its safe operation shall be provided by the Type Design Organisation of a public transport aircraft to be granted a Hong Kong Certificate of Airworthiness. The information and instructions may form part of the Operations Manual, or may be produced as a separate document, which shall be entitled 'Crew Manual'.

NOTE: In this Sub-section the word ‘manual’ is used to indicate ‘Crew Manual’, or the information and instructions to the crew which may be part of the Operations Manual.

1.1 The manual must be available for issue to a standard of completion acceptable to the Director-General at the time of issue of the Certificate of Airworthiness, unless otherwise agreed by the Director-General.

2 GENERAL

2.1 Except as otherwise agreed by the Director-General the manual shall be certified and published under the authority of the Organisation approved for design of the aircraft. The Director-General reserves the right to investigate the contents of the certified manual and to require the embodiment of any revision or amendment which he considers necessary to satisfy the requirements.

NOTE: The Director-General may accept a manual published by an Organisation other than the aircraft Type Design Organisation provided that the manual complies with HKAR-1 Sub-section 1.7-3.

2.2 The manual, when published by an approved Organisation, must comply with HKAR-1 Sub-section 1.7-3. One copy of the certified manual must be given to the Flight Standards and Airworthiness Division.

2.3 The aircraft Type Design Organisation shall obtain from the manufacturers of engines, auxiliary power units, propellers, radio and radar apparatus, and from the manufacturers of products which are approved under either the
Accessory Procedure or the Component Procedure prescribed in Sub-section 1.4-8, such certified information relating to their products necessary for the completion of the manual. Should the aircraft Type Design Organisation wish to depart from the information supplied, the agreement of the original manufacturer shall be sought. The Director-General shall be informed of disagreement and will adjudicate where necessary.

2.4 The manual shall be adequately illustrated and include such instructions and information considered necessary to meet the requirements of this Sub-section. Manuals complying with the applicable recommendations in paragraph 3 would fulfill the requirements.

2.5 The manual shall contain those parts specified under paragraph 3.15, headed 'Flight Planning Data', which are not part of the Flight Manual.

2.6 Any other instructions and information may be omitted from the manual only if the Flight Manual contains all (not parts) of the information specified under any item of a subject. In the event of any such omissions appropriate cross-references must be made to the Flight Manual.

2.7 The instructions and information in the manual must be presented in a manner suitable for use by the crew, giving sufficient detail for a proper understanding of each subject, and shall be consistent with the Flight Manual, with particular emphasis on the instruments and controls in the flight crew compartment. The manual should not contain superfluous matter regarding engineering and construction. The advice of the Director-General should be sought in cases of doubt.

3 FORMAT

Some, possible all, of the contents of the Crew Manual will be repeated in an Operations Manual. There are obvious advantages, therefore, in producing the Crew Manual in a format that will permit the contents to be incorporated in an Operations Manual without being changed or rewritten. The UKCAA has published a document, CAP 450, 'Specifications for Operations Manuals' giving guidelines on the preparation of these manuals. It is recommended that this document be studied before the Crew Manual is prepared and that it is produced in conformity with those guidelines. The following information is for guidance in compiling a manual to comply with the requirements of this Sub-section 1.7-3.

3.1 TITLE PAGE
3.2 NOTE TO READERS

The conventions used in the manual (e.g. where words are in capital letters this indicates a placarded marking in the aircraft, similarly statements that all speeds given are ‘indicated airspeeds’) scope and purpose of the manual and list of contents.

3.3 INDEX OF AMENDMENTS (PERMANENT) ISSUED BY TYPE DESIGN ORGANISATION

3.4 INDEX OF AMENDMENTS (TEMPORARY) ISSUED BY TYPE DESIGN ORGANISATION

3.5 INDEX OF AMENDMENTS (PERMANENT) ISSUED BY OPERATOR

3.6 INDEX OF AMENDMENTS (TEMPORARY) ISSUED BY OPERATOR

3.7 LIST OF ASSOCIATED PUBLICATIONS

3.8 INTRODUCTION

A brief introduction to the aircraft, its structure, systems, equipment and roles, including a three-view general arrangement drawing giving dimensions and such illustrations as may be necessary to cover panel coding, bulkhead numbering and nomenclature.

3.9 FLIGHT CREW COMPARTMENT

Lay-out, crew stations, controls, equipment, instruments and lights with appropriate illustrations.

3.10 SYSTEMS AND EQUIPMENT

As appropriate:- air conditioning; auto-pilot; flight systems; communications; electrical power distribution; fire protection systems including warning and extinguishing devices; flight control; fuel; hydraulic power; ice and rain protection; landing gear; navigation equipment including radio aids; instruments and radar; oxygen system including portable sets; pitot static system; fatigue meters; ice-detection, etc.; power-plant; auxiliary power units; starter pods; oil systems; emergency and survival equipment with locations and working instructions; cabin accommodation; galleys; warning lights; all of which should be covered in the following way:-
(a) Description, consisting of location of main components in diagrammatic or table form; technical description of the system or installation; system and component functioning; controls, indicators and instruments, and power (electric, hydraulic and/or pneumatic) supplies in diagrams or table form (structural information should be given only where necessary for clarity).

(b) Management, consisting of normal conditions before flight, in flight and after flight, and abnormal conditions (i.e. malfunctioning and abnormal external conditions which do not constitute an emergency (see paragraph 3.13)).

(c) Ground Servicing, consisting of items of system ground servicing that the crew may be required to supervise or carry out in the event of a stop where full servicing facilities are not available; location of system ground servicing points in diagram form, and system replenishing and off-loading.

3.11 LIMITATIONS

As prescribed in the Flight Manual.

3.12 HANDLING PROCEDURES

General handling techniques applicable to all procedures; departure, starting, taxying and take-off; flight handling, normal climb and cruise and flight in adverse weather, arrival, descent, field approach and landing; abnormal conditions, feathering, unfeathering, relighting, asymmetric flight, auto-rotation, etc., crew training, procedures outside normal operation but necessary for crew training; and ground handling, ground running and testing, ground manoeuvring, parking and mooring.

NOTE: Standard procedures, such as holding patterns and VOR procedures, which are considered to be part of basic piloting knowledge, may be omitted, except for those items of equipment which introduce new concepts.

3.13 EMERGENCIES

Essential operating procedures for emergency conditions (but excluding abnormal conditions (see paragraph 3.12)). An emergency in this context is defined as a foreseeable but unusual situation in which immediate and precise action will substantially reduce the risk of a catastrophe; those steps in which immediate action is essential to safety shall be distinguished from the steps
which are taken subsequently.

3.14 CHECK LISTS

Crew check lists with transit checks where applicable.

3.15 FLIGHT PLANNING DATA

Example calculations and flight plans, performance, fuel and oil consumption, etc.

3.16 LOADING AND CG DATA

Definitions, data, example calculations and typical loading examples and instructions for using the Weight and Centre-of-Gravity Schedule (Sub-section 1.7-10) for all reasonable combinations of loading. In the case of aircraft in which provision is made for the carriage of freight, floor loading limitations and adequate information to enable the operator to position and secure freight.

4 REVIEW AND AMENDMENT OF MANUALS

4.1 The aircraft Type Design Organisation shall review certified manuals at periods not exceeding six months and where changes have been made by him, permanent revisions or amendments shall be published. The revisions or amendments must comply with HKAR Sub-section 1.7-3. One copy of each revision or amendment shall be forward to the Flight Standards and Airworthiness Division.

4.2 Essential information, which has to be issued in the shortest possible time, may be published by a serialised system of temporary revisions or amendments which shall be certified and printed on pages readily distinguishable from ordinary pages, and subsequently embodied in the permanent revision or amendment procedure.

4.3 The details of the system and the manner in which amendments are to be incorporated and recorded shall be adequately explained.

4.4 Permanent revisions or amendments or temporary revisions or amendments shall be distributed by the Type Design Organisation to holders of the manual, together with the necessary instructions for embodiment and recording in the manual.
4.5 Operators with appropriate approval may amend manuals without reference to the Type Design Organisation, provided that the technical substance of the change is within the terms of their approval. In this case the operator shall proceed as follows:-

(a) Prepare a temporary or permanent revision or amendment in compliance with this Sub-section.

(b) Provide the Flight Standards and Airworthiness Division with a copy.

(c) Incorporate the revision or amendment in the manuals and record the embodiment in a revision or amendment record, which is separate from that provided by the Type Design Organisation.

NOTE: Where operators wish to amend manuals, co-operation with the Type Design Organisation is recommended. This also applies where amendments to manuals are necessary due to the incorporation of Minor modifications under the CAD Form DCA 261 procedure (see Sub-section 1.2-5).
SECTION 1.7

SUB-SECTION 1.7-4

MAINTENANCE, OVERHAUL AND REPAIR MANUALS

1 INTRODUCTION

Manuals containing information and recommendations necessary for the maintenance, overhaul and repair of aircraft, including engines and auxiliary power units, propellers, components, accessories, equipment, instruments, electrical and radio apparatus and their associated systems, and radio station fixed fittings, shall be provided by the constructor/manufacturer as required by Sub-section 1.5-3. This Sub-section 1.7-4 is to provide guidance in the compilation of such Manuals.

2 AIRCRAFT MAINTENANCE MANUAL

This should include the information described in paragraphs 2.1 to 2.11.

2.1 Introduction

A brief survey of the aircraft features and data of general interest.

2.2 Description

The construction of the aircraft including its control surfaces, landing gear, flying control systems and all other systems, e.g. hydraulic, pneumatic, vacuum and de-icing; all installations, e.g. engine, auxiliary power unit, propeller, instrument, electrical, and radio station fixed fittings and all equipment installations, e.g. lifebelts, dinghies, fire detection and prevention. Where necessary, the purpose of individual parts should be described.

2.3 Operation

The method whereby the components, systems and installations achieve their designed purpose.

2.4 Control

The method of operating the components, systems and installations together with any special procedures and limitations.
2.5 Servicing

Details regarding servicing points, capacities of tanks, reservoirs, etc., types of fluid to be used, with details of any anti-corrosive measures to be taken, pressures applicable to the various systems, position of access or inspection panels, walkways and drain locations, lubrication points and the lubricants to be used. Details of servicing equipment, ground handling details such as taxying, towing, parking, mooring, jacking and levelling, and loading data including loading limitations. Details of ground de-icing fluids and other fluids where contamination could cause a dangerous deterioration in airworthiness.

NOTE: Suitable de-icing and cleaning fluids which are approved for use by the aircraft constructor may be listed, together with information concerning the means to counteract any detrimental action which might result from their use.

2.5.1 Procedures for the ground de-icing and anti-icing of aircraft should be included in the Maintenance Manual or in a separate document referred to in the Maintenance Manual.

2.6 Maintenance

2.6.1 Schedule

The recommended periods at which each part of the aircraft, engine, auxiliary power units, propellers, the accessories, instruments and equipment, should be cleaned, inspected, adjusted, tested and lubricated, and the degree of inspection recommended at the periods quoted. The recommended periods at which components and accessories should be overhauled, the Mandatory Life Limitations identified in Sub-section 1.5-3, paragraph 4.1, and a cross-reference to the section of the Overhaul Manual which lists the Mandatory Life Limitations of engine or propeller parts. A procedure for converting flying hours or landings, as applicable, into life units (e.g. cycles) together with the assumptions made with regard to the 'typical cycle' on which the lives are based.

2.6.2 Procedures

The methods to be used for implementing the recommended schedule, e.g. methods of access to specified parts, methods of inspection, including those of carrying out duplicate inspections of vital points
and control systems (see Sub-section 1.5-3).

2.6.3 **Faults and Rectification**

The faults which may arise during service or those which may be found as a result of inspection, together with suggested causes and recommended methods of rectification.

2.6.4 **Adjustments and Testing**

The methods of completing the adjustments or tests which may be required during service or to correct faults, e.g. control movements with permissible tolerances.

2.7 **Removal and Assembly**

The order and method of removing and refitting components and accessories, together with details of any special precautions to be observed.

2.8 **Line Repairs**

Repairs of a temporary or minor nature which, in the opinion of the constructor, could be applied to the aircraft whilst remote from suitable facilities.

2.9 **General Procedures**

The method of applying general procedures such as system testing during ground running, checks after a heavy landing, change of role, symmetry checks, weighing and determination of centre of gravity and salvage considerations, such as lifting and shoring.

2.10 Details of crating and unpacking of components, as considered necessary; conditions of storage, with recommended limiting periods, and component dimensions and weights.

2.11 **Compliance**

The manner of complying with the above should be such that it is primarily directed to those persons who will be responsible for maintaining a complete aircraft in a state of airworthiness.

**NOTE:** The aircraft Maintenance Manual should not contain data relating to the complete
overhaul of a component.

3 AIRCRAFT OVERHAUL MANUAL

This should include the information described in paragraphs 3.1 to 3.5.

3.1 Aircraft Structures and Control Surfaces

The extent of overhaul data for structures including control surfaces should be such as to ensure that owners and operators are made aware at an early stage of the recommended standard of overhaul required initially to ensure the continued airworthiness of the structures including control surfaces over a stated period of flying hours and/or elapsed calendar time, or at the termination of a specified number of flights and/or landings. Subsequent amendments should be made as necessary to acquaint owners and operators of the latest findings or experience so that the manual reflects current knowledge of the aircraft thereby enabling increases or decreases, as appropriate, to be made in the recommended periods.

3.2 Integrity of Structures

Information, as detailed below, should be provided initially for the main aircraft structures.

3.2.1 Illustrations which show clearly the construction of the structures, with descriptive text to clarify the illustrations and draw attention to those parts which require detailed attention during overhaul.

3.2.2 Diagrams showing those parts of the structure to which access cannot be gained through the normal inspection doors and panels, the diagrams being supplemented by a table defining the limits of inaccessibility.

3.2.3 Diagrams showing structures classified as primary and secondary.

3.2.4 Table showing the recommended limiting periods at which designated parts of the structure should be overhauled in compliance with the standards given in the following paragraphs.

3.2.5 Information giving the methods and the extent of dismantling necessary to gain access to normally inaccessible structure, e.g. whether by removal of skin, by provision of additional panels,
removal of fuel tanks, etc., and detailing any special opportunities of gaining access to normally inaccessible structure, e.g. during any component change programme.

3.2.6 A tabulated schedule of overhaul, relating to paragraphs 3.2.2 and 3.2.4, which defines the overhaul work and inspections and tests necessary after the normally inaccessible structure has been reached, and the method of implementing the schedule.

3.2.7 Details on the application of special inspection techniques, e.g. radiographic and ultrasonic testing, with a proven technique of examination where such processes are required. The limitations of such processes and limits of their applicability should be clearly defined. Any special techniques necessary for proving the serviceability of castings, forgings, tubular members, etc., should be given.

3.2.8 Details of the protective treatment to be used to restore the original standard of protection, the final inspection of the structure or control surfaces, and the methods of closing structure which has been opened.

3.2.9 Details regarding the correlation of the bolt/joint overhaul programme (see paragraph 3.3.1) with the prescribed sampling programme, and the necessity to overhaul accessories and equipment in normally inaccessible structure at the structure overhaul periods.

3.3 **Integrity of Attachments and Joint Assemblies**

3.3.1 Diagrams showing the positions of bolt and stud holes in spar booms and other primary structure, and in such secondary structure where, if failure occurs the associated primary structure may be affected. The diagrams should be annotated or marked to show the bolt or stud holes which are accessible and those normally inaccessible; the size of the holes and whether bushed; the materials forming the mating surfaces; fits and clearances and dimensional limits and a reference to identify the holes.

3.3.2 Using the reference identifying the holes, tables giving the total number of holes, recommended number of bolts or studs to be withdrawn from each group for operators having fleets of 2, 5, 10 and 20 aircraft, recommended number of bushes to be withdrawn, and recommended number of flying hours, flights, landings and/or
the elapsed time at which bolts, studs or bushes should be withdrawn, having regard to the possibility of fatigue, fretting and corrosion.

NOTE: Where an arrangement has been made between operators by the constructors for a shared programme of bolt and hole sampling, it is recommended that details of the programme be provided in Service Bulletins, etc.

3.3.3 Details of the methods and extent of dismantling necessary to gain access to the nominated bolts or studs where this differs from paragraph 3.2.5.

3.3.4 Details of the precautions necessary during the removal of bolts or studs, special tools or equipment necessary, the recommended inspection and crack detection procedure, e.g. penetrant or fluorescent dyes, special optical instruments, etc., salvage methods and limitations, schedule of oversize bolts, studs, and bushes available, protective treatment, methods of re-assembly and locking, including torque loading data, and details of recording schemes to identify the bolts, studs or holes examined.

3.4 Mandatory Life Limitations

A Schedule detailing those parts of the aircraft and the aircraft structure which are to be replaced by new parts and the mandatory periods of renewal.

3.5 Aircraft Systems

Details of recommended overhaul practices of aircraft systems such as flying controls, hydraulic and electrical installations.

4 AIRCRAFT REPAIR MANUAL

4.1 This manual should be confined to a description of the repairs applicable to the aircraft structure and components, and to those parts of the systems and installations which are the design responsibility of the aircraft constructor, and should include the information described in paragraphs 4.2 to 4.11.

4.2 Introduction

General notes on the contents and usage of the manual.

4.3 General Information
Details of recommended repair procedures and practices which have a general application, with diagrams showing:-

(a) Structures classified as primary and secondary with areas or parts where repairs are not permissible clearly defined.

(b) The construction of main structures and components with station positions which define the extent of skin panels, and the construction of primary longitudinals, frames, stringers and ribs, with details of the dimensions and materials used.

(c) Tables of standard and special extruded sections with, where applicable, approved alternatives.

(d) Tables of fasteners for each part of the structure, with information on the areas where oversize fasteners may be used.

4.3.1 Details of process specifications, heat treatment procedures, protective treatment requirements, precautions necessary during repairs, e.g. damage by drilling into hidden structures and building in assembly stresses, details of special processes such as metal-to-metal bonding, welding, sealing of pressurised structures, etc.

4.4. **Preparation for Repair**

Details of, for example, the inspection necessary before repair, damage assessment standards, methods of supporting the structure, alignment and geometry checks, material allowance for dressing of damage, and limits of wear.

4.5 **Tools and Equipment**

A list of tools and equipment necessary for applying repairs, with details of their purpose and method of use.

4.6 **Temporary Repairs**

Details of repairs of a temporary nature which would permit the aircraft to return to base for a permanent repair.

4.7 **Standard Repairs**
Details of repairs which can, within defined limits, be applied as applicable, to various structures, systems and installations.

4.8 **Minor Repairs**

Details of permanent repairs which apply only to specified parts of the structure or particular components. Each part of the aircraft structure, its systems and installations should be considered, the sub-divisions of this section following the same sequence as that used in the Maintenance Manual. Only minor repairs, which do not require extensive dismantling or the use of special jigs or equipment, should be included.

4.9 **Major Repairs**

Details of permanent repairs which would normally only be completed at the main base, e.g. those which would require the use of special jigs and equipment.

4.10 **Checking and Testing after Repair**

Details of those checks or tests necessary after repair, e.g. structure alignment checks, adjustment of control surface balance and fuselage pressure testing.

4.11 **General**

The repair schemes specified in paragraphs 4.6 to 4.9 should, as far as possible, be diagrammatically presented with the text adjacent, giving details of negligible damage, the limits of repairable damage, the applicability of the particular repair and the procedure involved in its embodiment.

5 **ENGINE AND AUXILIARY POWER UNIT MANUALS**

Engine and Auxiliary Power Unit Manuals should contain the following descriptive, servicing, maintenance and overhaul data relating to the engine, and similar data relating to those components and accessories either on the engine or in the power unit, in respect of which an application for design approval has been made by the engine constructor. Such data should conform to the recommendations of paragraph 7.

5.1 **Engine and Auxiliary Power Unit Maintenance Manuals**
5.1.1 Introduction

A brief description of the engine and engine systems.

5.1.2 Description

A detailed description of the construction of the engine, including the systems and, where necessary, the purpose of the individual parts. For modular engines, details of the division of the engine into modules (see JAR-E Section C, Chapter C1-2 for definition) giving the nomenclature and clearly defining the boundaries for each module.

5.1.3 Operation

The method whereby the components, systems and installations achieve their designed purpose.

5.1.4 Installation

Methods of uncrating, acceptance checking, de-inhibiting, lifting, and installing an engine into a power unit, the method of attaching accessories to an engine or power unit, and the checks necessary after such installation.

5.1.5 Control

Methods of starting, running, testing and stopping the engine and its components, systems and installations, with any special procedures and limitations.

5.1.6 Servicing

Details regarding servicing procedures, capacities of tanks, reservoirs, etc., types of fluid to be used, and the draining of collector tanks.

5.1.7 Maintenance

(a) Schedule and Procedures

Compliance with the recommendations in paragraphs 2.6.1 and 2.6.2.
(b) **Faults and Rectification**

Compliance with the recommendations in paragraph 2.6.3, together with inspections necessary after abnormal circumstances, such as shock loading, sudden stoppage, excessive out of balance, fire, over-speed, over-temperature, or any other excursions outside approved limitations.

(c) **Adjustments, Component Removals and Testing**

The methods of completing those adjustments, tests or removal of components, e.g. cylinders or combustion chambers, which may be required during service or to correct faults.

(d) **Modular Engines**

In respect of modular engines, in addition to (a), (b) and (c):

(i) In carrying out a module change, the means of checking the serviceability of the other modules fitted to the engine (e.g. establishing that they have not been adversely affected by blade damage, oil contamination, internal air system contamination).

(ii) The compatible modification standards for the interchange of modules.

(iii) Details of the methods, tests and equipment by means of which adequate engine performance, functioning and mechanical integrity (e.g. freedom from leaks, oil consumption, oil pressure, run down time) may be established following a module change on an installed engine.

5.1.8 **Removal**

The order and method of removing the engine from a power unit, and the removal of accessories from either the engine or the power unit, with the methods of engine lifting, inhibiting and crating for return to manufacturer or base.

5.1.9 **Tools and Equipment**
Tools and equipment necessary for maintenance with details of their purpose and method of use.

5.1.10 Mandatory Life Limitations

A procedure for converting flying hours, or landings, as applicable, into life units (e.g. cycles) together with the assumptions made with regard to the 'typical cycle' on which the lives are based.

5.2 Engine and Auxiliary Power Unit Overhaul Manuals

5.2.1 Tools and Equipment

Tools and equipment necessary for overhaul and testing, with details of their purpose and method of use.

5.2.2 Dismantling

The order and method of dismantling for overhaul.

5.2.3 Cleaning and Inspection

The materials, equipment and methods to be used for cleaning. The materials and equipment to be used, and the standards and methods of inspection to be applied, during overhaul, and also after abnormal circumstances such as shock loading, sudden stoppage, excessive out of balance, fire, overspeed, over-temperature or any other excursions outside approved limitations.

5.2.4 Fits and Clearances

Details of all relevant fits and clearances.

5.2.5 Repair and Salvage Schemes

Details of all applicable repair and salvage schemes.

5.2.6 Re-assembly

Description of the order and method of assembly at overhaul.

5.2.7 Testing
Details of the standards to be observed, the method of completing tests, and a list of faults which may occur during testing, together with possible causes and methods of rectification.

5.2.8 **Storage Conditions and Limiting Period**

Details of the conditions of storage and the recommended limiting storage periods.

5.2.9 **Mandatory Life Limitations**

A list of the relevant parts, with details of the Mandatory Life Limitations, with a cross reference to the Maintenance Manual for the procedure for converting flying hours or landings, as applicable, into life units (e.g. cycles) together with the assumptions made with regard to the 'typical cycle' on which the lives are based.

### 6 PROPELLER MANUALS

Propeller manuals should contain descriptive, servicing maintenance and overhaul data relating to the propeller and similar data relating to those accessories concerned with the functioning and control of the propeller in respect of which an application for design approval has been made, as outlined in paragraphs 6.1 and 6.2; such accessory data should conform to the recommendations of paragraph 7.

#### 6.1 Propeller Maintenance Manual

6.1.1 **Introduction**

A brief description of the propeller and propeller systems.

6.1.2 **Description**

A detailed description of the construction of the propeller.

6.1.3 **Operation**

The method whereby the propeller and the propeller systems achieve their designed purpose.

6.1.4 **Installation**
The method of uncrating, acceptance checking, lifting and installing the propeller.

6.1.5 Control

The method of checking the operation of the propeller during engine running, with details of any special procedures and limitations.

6.1.6 Maintenance

(a) Schedule and Procedures

Compliance with the recommendations in paragraphs 2.6.1 and 2.6.2.

(b) Faults and Rectification

Compliance with the recommendations in paragraph 2.6.3.

(c) Adjustments

The methods of completing those adjustments which are necessary during service or to correct faults.

6.1.7 Removal

The order and method of removing the propeller from the engine.

6.1.8 Mandatory Life Limitations

A procedure for converting flying hours or landings, as applicable, into life units (e.g. cycles) together with the assumptions made with regard to the 'typical cycle' on which the lives are based.

6.2 Propeller Overhaul Manual

Compliance to the standards recommended in paragraph 5.2.

7 ACCESSORY, INSTRUMENT AND ELECTRICAL EQUIPMENT MANUALS
Separate manuals should normally be provided by the accessory, instrument or equipment manufacturer for (a) Maintenance and (b) Overhaul, the manuals containing data which conforms to the standard indicated by the subjects detailed below, where applicable.

7.1 Maintenance Manuals

7.1.1 Description, Operation and Data

7.1.2 Unpacking

7.1.3 Acceptance Checks

7.1.4 Storage Instructions

    Conditions
    Limiting Periods (recommended)

7.1.5 Checks/Tests Before Installation

7.1.6 Installation

7.1.7 Checks/Tests After Installation

7.1.8 Operation Instructions

7.1.9 Maintenance Schedule

    To include recommendations in respect of overhaul periods and/or Mandatory Life Limitations, as appropriate.

    NOTE: In certain circumstances life limitations may become mandatory; in such cases these must be indicated.

7.1.10 Trouble Shooting Procedures

7.1.11 Removal

7.1.12 Bench Checks

7.1.13 Return to Manufacturer or Base

7.2 Overhaul Manuals
7.2.1 Description, Operation and Data

7.2.2 Disassembly

To include any checks or tests considered necessary before disassembly, and a list of items which are to be discarded and replaced by new parts at overhaul.

7.2.3 Cleaning

7.2.4 Inspection/Check

7.2.5 Repair

7.2.6 Assembly

7.2.7 Fits and Clearances

7.2.8 Testing

7.2.9 Trouble Shooting Procedures

7.2.10 Storage Instructions

Conditions
Limiting Periods (recommended)

7.2.11 Special Tools, Fixtures and Equipment

8 REPLACEMENT PARTS

8.1 Unless Manuals include detailed part identification of all replacement parts appropriate to the work described in the Manual, a statement should be included in each appropriate Manual specifying the documents which identify these parts.

8.1.1 Each Manual should also contain a statement that all replacement parts must be either those parts detailed in the manufacturers' publications or documents, or approved alternative parts.
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APPENDIX NO. 1 TO SUB-SECTION 1.7-4

AUTOMATIC TEST EQUIPMENT SOFTWARE

1 INTRODUCTION

1.1 The requirements of this Appendix are applicable to any Automatic Test Equipment (ATE) Software, which is essential to the use of ATE in testing a specific airborne equipment, where the ATE Software is provided as an alternative to, or in place of, conventional test procedures in Maintenance, Overhaul or Repair Manuals. The requirements do not apply to either ATE Software used by a manufacturer as part of the process leading to certification of a new product or test equipment which is an integral part of airborne equipment (built-in test equipment - BITE).

2 DEFINITIONS

2.1 ATE Software Design Control Authority

The ATE Software Design Control Authority is the original producer of ATE software or, if the software has been revised, the organisation certifying the revisions.

2.2 Data Processing Terms

The terms used in this Appendix are in accordance with British Standard BS 3527, Glossary of Terms used in Data Processing.

3 GENERAL

3.1 Except as otherwise agreed by the Director-General, software produced in accordance with this Appendix shall be certified and published under the authority of an appropriately approved Organisation and shall relate accurately to the design and production standard of both the specific airborne equipment to be tested and the ATE itself. In particular, programs shall be allocated a coding or part number which can be directly related to the build standards of both the ATE and the unit under test (UUT). Failing adequate protection being provided within the ATE, object program content shall include protection against unauthorised editing.
NOTE: The original equipment manufacturer and its recommended ATE software companies which have been approved by the Authority of the State of Manufacture are recognised by the Director-General as an appropriately Approved Organisation. The Director-General may accept the certification issued under the Law of the State of Manufacture.

3.2 The Director-General reserves the right to require the re-assessment of the content of any certified software and to require the embodiment of any revision or amendment which is considered necessary to satisfy the requirements of paragraphs 3, 4, 5 and 6.

3.3 Software, produced by an Approved Organisation other than the original equipment manufacturer or its recommended ATE software companies, must be associated with a statement that it complies with the requirements of this Appendix.

3.4 Software, when used with the ATE to which it relates, shall be such as to ensure that all specified tests of the specific airborne equipment are either completed satisfactorily or result in an unambiguous indication to the contrary.

3.5 The certification shall be worded as follows and must appear on the relevant record sheet:

STATEMENT OF INITIAL CERTIFICATION

The software identified ..................................complies with HKAR-1 Sub-section 1.7-4, Appendix No. 1.

Signed ..........................................................

Date ............................................................

CAD Approval No: ...........................................

NOTE: The above certification does not apply to revisions or amendments. Revisions or amendments must each be separately certified. Suitable records shall be maintained of all revisions or amendments (whether temporary or permanent) to ATE software.

The following information is for guidance in preparing ATE software to
comply with the requirements of this Appendix. It is biased towards systems which are computer controlled but the principle can also be applied to sequential tape controlled equipment.

4 SOFTWARE RELATED TO THE TESTING OF SPECIFIC AIRBORNE EQUIPMENT

4.1 The software should normally consist of three main parts, together with associated record and control documentation, as follows:

(a) A test specification in plain English or the Abbreviated Test Language for Avionic Systems (ATLAS) which will normally be that contained in the Overhaul Manual for the airborne equipment under test.

(b) A test sequence in a test program format suitable for the particular ATE (SOURCE PROGRAM).

(c) A test sequence in the media (e.g. magnetic disc, tape) used to control the particular ATE (OBJECT PROGRAM).

4.2 Each of the above parts should separately be subject of issue control and modification procedure.

4.3 Programs should be specified in a manner which satisfies the requirements of paragraph 2.1 (a), having due regard to the characteristics of the equipment under test and taking account of the inherent limitations of the ATE. Particular attention should be paid to ensure that programs do not lead to circumstances which induce incipient damage into the equipment under test.

4.4 All programs should be fully debugged and validated prior to certification.

5 SOFTWARE RELATED TO SPECIFIC ATE

5.1 All software, e.g. assemblers, compilers, self test programs, should be fully documented, debugged and validated prior to certification.

6 REVIEW AND AMENDMENT TO SOFTWARE

6.1 Certified software shall be reviewed by the ATE software design control
authority at periods not exceeding six months and where changes have been made affecting the validity of the software, permanent revisions or amendments shall be published.

NOTE: The Director-General may accept the certification issued under the Law of the State of Manufacture.

6.1.1 The certification of permanent revisions or amendments shall be as follows:-

**STATEMENT OF REVISION/AMENDMENT**

Software Identification .......................................

This permanent revision / amendment complies with HKAR-1, Sub-section 1.7-4, Appendix No. 1.

Signed  .....................................................

Date  .........................................................

CAD Approval No:  .................................

6.2 Operators with appropriate approval may amend ATE software without reference to the originating ATE software design control authority, provided that the amendment of ATE software is within the terms of their Approval. However, co-operation with the appropriate airborne equipment manufacturer should normally be undertaken in order to ensure that ATE software adequately meets the test requirement of the UUT. Any operator undertaking amendment of ATE software shall proceed as follows:-

(a) Prepare a revision or amendment in compliance with this Sub-section 1.7-4.

(b) Incorporate the revision or amendment in the program and retain an appropriate record of the details of the amendment. The record can be in any convenient form, e.g. log book, record sheets or retention of pre-revision tapes for comparison.
SECTION 1.7

SUB-SECTION 1.7-5

APPROVAL OF MAINTENANCE SCHEDULES

1 INTRODUCTION

1.1 Applicability

The requirements of this Sub-section 1.7-5 are applicable to Maintenance Schedules and associated Maintenance Programmes (hereinafter referred to as the 'Schedule') submitted for approval as required by the Air Navigation (Hong Kong) Order 1995.

1.2 Purpose

This Sub-section 1.7-5 provides an applicant intending to gain approval of a Schedule or amendments thereto, with:

(i) Procedures to follow when seeking to gain approval of a Schedule.

(ii) Procedures for the control and approval of amendments to Schedules.

1.3 Approval

When satisfied with the content of the Schedule, the Director-General will signify this approval by issuing a CAD Approval Document DCA 281 to the applicant.

NOTE: It is not intended that the Type Certificate (TC) Holder should also submit the maintenance inspection programme required by Sub-section 1.5-3 or the certification code for approval in accordance with this procedure. Sub-section 1.6-2 lists the minimum content of the Schedule and a TC Holder may use that list as guidance for the acceptable content of the Scheduled Inspection Programme submitted as part of the Type Certification procedure. Such Programmes are not specifically approved by the Director-General, but they are accepted when considered satisfactory by the Authority issuing the Type Certificate as part of the procedure leading to the issue of the Type Certificate (or Certificate of Airworthiness when required).

2 MAINTENANCE SCHEDULE APPROVAL PROCEDURES

2.1 To comply with the Air Navigation (Hong Kong) Order 1995, an aircraft registered in Hong Kong in respect of which a certificate of airworthiness is in
force shall not fly unless the aircraft (including in particular its engines),
together with its equipment and radio station, is maintained in accordance with
a maintenance schedule approved by the Director-General in relation to that
aircraft.

The Applicant shall submit for approval a Maintenance Schedule and, where
applicable, all of the associated procedures intended to ensure that the
airworthiness of the aircraft will be preserved on a continuing basis. These
procedures shall, as a minimum, ensure a review of the effectiveness of the
Schedule on a continuing basis. Schedules shall be submitted and approved
in accordance with this paragraph 2.

2.2 Normally the Director-General expects that all Schedules will be based upon
the TC Holder's recommendations. The Schedule may use the traditional
processes of inspection, servicing, and replacement/overhaul at stated periods,
or such processes may be combined with other processes which permit the
adjustment of the work content and periods in accordance with information
derived from the operation and maintenance of the aircraft concerned.

2.3 Notwithstanding paragraph 2.2 it may be possible for the Operator to develop
or escalate the TC Holder's Programme in accordance with procedures
approved by the Director-General (see paragraph 3.1 below).

NOTE: Where it is proposed that such maintenance processes be monitored by a statistical
reliability procedure of a condition monitored (see CAD 418 Condition Monitoring
Maintenance: an Explanatory Handbook) or reliability centred Maintenance
Programme, such a procedure will need the approval of the Director-General, and
will be deemed part of the Schedule (see Appendix 1 to Sub-section 1.6-2).

2.4 Where Maintenance Review Board (MRB) procedures are applicable to the
Type Certification of a particular type, then these procedures will be applied
as stated in Sub-section 1.5-2.

NOTE: (1) Guidance on the MRB report content and on MRB procedures are contained in
Sub-section 1.5-2.

(2) Where TC Holder's maintenance planning data developed from an MRB is used,
this should be clearly identified in the Schedule.

(3) Certification Maintenance Requirements (CMR) may arise as a result of the
System Safety Assessment necessary for compliance with JAR (FAR) 25.1309.
The associated tasks should be clearly identified as being separate from MRB
tasks. (See also paragraph 3.1.4).

2.5 Application

Application for approval of the Schedule shall be made in writing. One copy
each of the Schedule, and any other documents or procedures, required in a
particular case, shall be forwarded with the application to the Airworthiness Office, Civil Aviation Department.

2.6 The Applicant shall nominate a person (keeper or controller) who shall be responsible for the upkeep or control of the Schedule, including ensuring that the Schedule is suitably amended where applicable following the regular review.

3 GENERAL

3.1 Amendments to Approved Schedules

3.1.1 Amendments to Approved Schedules may only be approved when the Director-General is satisfied with the content or when the approval is obtained in accordance with Approved Procedures (see paragraph 3.1.2). The data in an Approved Schedule shall, where appropriate, be amended by the Operator to reflect the embodiment of mandatory and non-mandatory modifications and inspections, the incorporation of constructor's and manufacturer's requirements (bulletins, etc.), and the effects of maintenance experience. Amendments shall not be incorporated without the approval of the Director-General, unless an alternative method of approving such amendments has been accepted by the Director-General.

3.1.2 An organisation may be approved to provide reports and certify that the content of a Schedule amendment complies with the appropriate requirements, when the Organisation complies with the procedures set out in Supplement No. 1 to this Sub-section. In such cases the approval of the amendment may take place in accordance with the Organisation's Approved Procedures.

3.1.3 Amendments required by the Director-General shall be incorporated in the Approved Schedule.

3.1.4 For aircraft types where CMR tasks are identified as part of the TC process, these tasks are subject to separate procedures for escalation.

3.2 Applicability to Individual Aircraft

The Schedule submitted to the Director-General for approval, must contain a list of the registration marks of the aircraft intended to be maintained in accordance with the Schedule, (see Sub-section 1.6-2 paragraph 3.2 (a)): changes to the list of aircraft constitute an amendment to the Schedule and as such requires the approval of the Director-General. The introduction of
aircraft to the Schedule, will also require an assessment by the applicant, of those (that) aircraft maintenance records, to determine what work must be carried out to align the aircraft concerned with the Schedule. The agreement of the Director-General should be sought for the content of this alignment check when such amendments are anticipated.

3.3 Maintenance Schedule Review Procedures

3.3.1 The applicant shall submit for approval to the Director-General, procedures to ensure that the Schedule is reviewed for effectiveness on a regular basis with the review carried out, as a minimum, once in every 12 months. When the effectiveness of the Schedule falls below the established criteria, the Schedule shall be amended as necessary to take into account the findings of such reviews.

3.3.2 The review procedures may include the Operator's escalation procedures which ensures that the Schedule is developed to reflect current operating experience and the TC Holder's recommendations.

3.3.3 All procedures intended to meet the intent of this paragraph 3.3 shall be submitted to the Director-General for approval.

3.4 Maintenance Task Card and Maintenance Instruction Development Procedures

3.4.1 The applicant may choose to develop Task Cards or Maintenance Instructions from the Schedule for ease of interpretation. These Task Cards or Instructions shall be developed using procedures approved by the Director-General. It is important that the content of the Task Cards or Instructions accurately reflects the content of the Approved Schedule and the content of the Aircraft Maintenance Manual. Task Cards and Maintenance Instructions must be revised to reflect revisions to source documents. There shall be a continuing audit of the effectiveness and applicability of these Task Cards or Instructions and the associated development procedures.

3.4.2 Task Cards may additionally be developed by the applicant for non-scheduled or non-routine tasks. The procedures used to develop these non-routine cards shall be submitted for approval in accordance with paragraph 3.4.1 above.

3.4.3 Where Maintenance Tasks or Maintenance Manual procedures are broken down into discrete maintenance steps or maintenance instructions, in particular for complex tasks, then the procedures used to develop these instructions shall be approved in accordance with
3.4.1 above.

3.4.4 All Task Cards and any associated Maintenance Instructions shall be separately identified and be controlled by a revision identification system. Each task or instruction should clearly cross refer to the relevant Schedule task or maintenance manual reference as applicable.

3.5 **Requirements**

Schedules and all associated airworthiness data, including those data used for the substantiation of escalation programmes (in particular where alternative procedures in accordance with paragraph 3.1.2 are employed) shall be made available to the Director-General upon request.
APPENDIX NO. 1 TO SUB-SECTION 1.7-5

MAINTENANCE SCHEDULE

1 INTRODUCTION

In preparing a Maintenance Schedule for initial approval by the Director-General, account should be taken of the following paragraphs.

2 MAINTENANCE SCHEDULE

The Maintenance Schedule shall at least contain the information set out in the paragraph 2.1 and 2.2 as applicable.

2.1 The following information shall not be varied or amended without direct approval from Director-General (with the exception of item (c) the revision record):

(a) DCA 281 Approval Document.

(b) Standard Maintenance Practices (SMP) as appropriate, including applicable aircraft registrations.

(c) Schedule Revision Record.

(d) Check Cycle criteria (e.g. A Check–400 FH, B Check–800 FH etc.), taking into account the anticipated utilisation of the aircraft.

(e) Certification Maintenance Requirements, Mandatory Life Limits, Mandatory Regulatory Requirements, and when applicable, a Continuing Structural Integrity Programme.

(f) MRB Safety Route (e.g. route 5 or 8) tasks (if applicable) or equivalent.

(g) Reference to the applicable maintenance control procedures or documents.

(h) Sampling Programme details or procedures.

(i) Schedule general particulars (see Sub-section 1.6-2 paragraph 3.2 (a) and (d)), including procedures for changing or deviating from the Continuing Structural Integrity Programme, maintenance tasks and the intervals.
(j) When applicable, condition monitoring and reliability programme descriptions for aircraft systems, components and powerplants.

2.2 Amendments to the following information may be approved by Director-General or in accordance with the approved procedures (see Sub-section 1.7-5 paragraph 3):-

(a) Maintenance tasks recommended by the MRB or Manufacturer's maintenance planning guide (excluding those listed in Part 1 above).

(b) Operator requirements (e.g. Operator supplemental inspections).

(c) Recommended or optional SB/SIL, etc.

(d) Lubrication Programme (other than Lubrication tasks arising from paragraph 2.1).

(e) Passenger entertainment and aircraft appearance tasks.

3 **HUMAN FACTORS CONSIDERATION**

The Schedule shall be prepared in respect of its design and application to ensure that the Human Factors principles have been observed. E.g. the information is written in “simplified” English and readily understandable to the target audience. Guidance material on the application of Human Factors principles may be found in the ICAO Human Factors Training Manual (Doc 9683).
SECTION 1.7
SUPPLEMENT TO SUB-SECTION 1.7-5

ORGANISATION APPROVAL FOR THE
APPROVAL OF MAINTENANCE SCHEDULE AMENDMENTS

1 INTRODUCTION

This Supplement does not replace the applicable operating requirements. This Supplement defines the requirement for applicants wishing to obtain Organisation Approval for the control of Schedule amendments. Appendix No. 1 to this Sub-section 1.7-5 sets out minimum content required when submitting Schedules and their associated amendment procedures for approval to the Director-General in such cases.

2 ORGANISATION

2.1 The Organisation shall demonstrate to the satisfaction of the Director-General that it has competence, and has in place procedures (see paragraph 3 of this Supplement) and record keeping provisions which will enable the Organisation to analyse aircraft reliability, TC Holder's instructions, and other related operating and maintenance criteria, to generate sound and logical proposals for changes to Schedules. To this end, the Organisation shall:

(a) Be the holder of an AOC, or HKAR-145 Approval, valid or rated for the type of aircraft for which the Schedule is intended; and

(b) Meet the requirement of this Supplement.

2.2 In addition to the respective requirement (CAD 360 or HKAR-145) the Organisation must satisfy the Director-General that it has adequate manpower resources and facilities to enable it to fulfil the intended role in relation to this Supplement.

2.3 A senior person or group of persons acceptable to the Director-General, whose responsibilities include ensuring that the Organisation remains in compliance with the requirement shall be nominated.

2.4 A person or persons (Schedule controller) acceptable to the Director-General, whose responsibility includes ensuring that the Schedule(s) controlled by the Organisation remains in compliance with the applicable requirements, shall be nominated.
2.5 Personnel shall be competent, capable of fulfilling their respective role, and shall be adequately trained to carry out the particular function for which they are responsible. Training shall be given where necessary in the procedures and development of Schedules. The personnel should demonstrate a sufficient familiarity with:

(a) Reliability Centred Maintenance processes.
(b) MSG Analysis and MRB procedures (where applicable to the type).
(c) Type Certification Requirements.
(d) Aircraft or System or Component type.
(e) Organisation Procedures relating to Schedule amendment control.
(f) Requirements applicable to the control of Schedules.

2.6 Records shall be kept such that the Organisation is able to demonstrate that the development of the Schedule is justified by approved data and in accordance with the approved procedures.

2.7 The Organisation shall be maintained to the standard necessary to undertake the work for which it is approved, and the Director-General shall at all reasonable times, have access to the Organisation for the purpose of assessing the standard in use.

2.8 The Director-General may revoke, suspend or vary the Terms of Approval if the conditions prescribed for the Approval are not maintained.

3 MAINTENANCE SCHEDULE AMENDMENT PROCEDURES

Maintenance Schedule amendment procedures are required for compliance with CAD 360 Part 2.

3.1 The procedures should contain reliability centred maintenance procedures which comply with Appendix No. 1 to Sub-section 1.6-2 and additionally have procedures relating to the Schedule control which contain the following provisions:-

(a) Task Escalation or adjustment.
(b) Maintenance Schedule review.
(c) Independent Quality Audit.
(d) Service Bulletin or Service Information assessment.
(e) Component, Equipment and structures in-service performance review.
(f) Maintenance Schedule revision.
(g) Maintenance procedure effectiveness review and amendment.
(h) Manufacturer Maintenance Planning Document review and assessment.
(i) Mandatory Airworthiness Directive review and assessment.
(j) Operations/Maintenance liaison.
(k) Sub-contract and supplier evaluation.
(l) Training.

3.2 The implementation of such procedures requires the management, assessment and integration of a wide spread of data from a wide range of sources. As a consequence, the Organisation should be able to effectively manage procedures which affect a number of different departments within the Organisation. Such maintenance procedures are sometimes known as maintenance control or maintenance integration procedures.

3.3 The Approved procedures shall make provision for a fully representative committee or group to meet on a regular basis to consider all of the operating and maintenance implications arising from the reviews set out in the above paragraph 3.2 and be able to collectively approve any associated Schedule amendments arising. Records shall be kept of the meeting and the associated minutes.

3.4 The Organisation shall make provision for the attendance of a representative of the CAD at any meetings held in accordance with paragraph 3.3. If, in the opinion of the Director-General, the decisions reached regarding the amendment to the Schedule are not fully justified by the criteria presented, then the Director-General may require that further substantiation is provided before the amendment may be incorporated.
SECTION 1.7

SUB-SECTION 1.7-6

MINIMUM EQUIPMENT LISTS

1 Detailed requirements in compiling a Minimum Equipment List and the acceptance of the MEL are contained in CAD 549 HKAR-MMEL/MEL.
INTRODUCTION

The Air Navigation (Hong Kong) Order 1995 requires that a Technical Log shall be kept for an aircraft registered in Hong Kong in respect of which a Certificate of Airworthiness in either the Transport or Aerial Work Categories is in force. The Air Navigation (Hong Kong) Order 1995 further requires that a Technical Log shall contain details of the time the aircraft took off and landed, particulars of defects and any other information affecting the airworthiness or safe operation of the aircraft.

NOTE: In the case of an aircraft not exceeding 2730 kg Maximum Total Weight Authorised which is not operated by a person who is the holder of an Air Operator’s Certificate or required to hold such a Certificate, an alternate form of record may be approved by the Director-General.

BASIC TECHNICAL LOG REQUIREMENTS

2.1 The Technical Log shall contain the following:-

(a) A Title Page with the registered name and address of the operator, the aircraft type and the full international registration marks of the aircraft.

(b) A valid Certificate of Maintenance Review as specified in Sub-section 1.6-2.

(c) A Maintenance Statement of the next inspection due to comply with inspection cycle of the Approved Maintenance Schedule and any out of phase inspection or component change due before that time.

NOTE: CAD 360 Air Operator’s Certificates Requirements Document Part Two gives an example of a Maintenance Statement which includes the Certificate of Release to Service required by Sub-section 1.6-2 and which would be acceptable to the Director-General.
(d) A readily identifiable section containing sector record pages. Each page shall be pre-printed with the operator's name and page serial number and shall make provision for recording the following:-

(i) The aircraft type and registration mark.

(ii) The date and place of take-off and landing.

(iii) The times at which the aircraft took off and landed.

(iv) Particulars of any defect in any part of the aircraft affecting the airworthiness or safe operation of the aircraft which is known to the Commander or, if no such defect is known to him, an entry to that effect.

(v) The date and signature of the Commander following completion of item (d)(iv).

(vi) The arrival fuel state.

(vii) A Certificate of Release to Service as required by Sub-section 1.6-2 in respect of any work carried out for the rectification of defects. This certificate shall be entered in such a position and manner as to be readily identifiable with the entry of the defect to which it relates.

(viii) The quantities of fuel and oil uplifted, and the quantity available in each tank, or combination of tanks, at the beginning of each flight.

(ix) The running total of flying hours, such that the hours to the next inspection can be readily determined.

(x) Provision for pre-flight and daily inspection signatures.

(xi) The times when ground de-icing was started and completed.

NOTES: (1) Where sector record pages are of the multi-sector 'part-removable portion' type then such 'part-removable portions' shall contain any of the above information necessary plus all relevant data from paragraph 3, if applicable, to ensure the safe operation of the aircraft.
(2) Examples of sector record pages which would be acceptable to the Director-General are shown in CAD 360 Air Operator’s Certificates Requirements Document Part Two.

(e) A readily identifiable section containing acceptable deferred defect record pages. Each page shall be pre-printed with the operator’s name and page serial number and shall make provision for recording the following:

(i) A cross reference for each deferred defect such that the original defect can be clearly identified in the sector record page section.

(ii) The original date of occurrence of the defect deferred.

(iii) Brief details of the defect.

(iv) A cross reference for each deferred defect such that the action in respect of such deferred defect can be readily identified on the sector record page.

NOTE: An example of a deferred defect record page which would be acceptable to the Director-General is shown in CAD 360 Air Operator’s Certificates Requirements Document Part Two.

2.2 The format of all sector record pages shall be submitted to the Director-General for acceptance, and agreement in respect of the supplementary information required (see paragraph 3).

3 SUPPLEMENTARY TECHNICAL LOG REQUIREMENTS

3.1 It will be necessary to record additional information for a specified aircraft. The following items are typical of what is required, where appropriate, but the list is not intended to be exhaustive:

(a) Maximum or Intermediate Contingency Power

It is necessary to record the duration of maximum and intermediate contingency power usage, and subsequently to transfer the information to the engine log book or maintenance record. For rotorcraft the record of each use of these powers must also subsequently be transferred to the log cards or other appropriate documents applicable to those components of the transmission which
always transmit the power from a single engine only, i.e. components upstream of any combining gearbox.

(b) Landings

The number of landings carried out will be necessary for undercarriage component life consideration.

(c) Flight Pressure Cycles

The number of pressure cycles will be necessary for fuselage life considerations.

3.2 Supplementary information shall be assessed by the operator and agreed by the Director-General.

4 RETENTION OF RECORDS

4.1 All entries in the Technical Log shall be made in duplicate, with provision for one copy of each entry to be removed and retained on the ground before the next flight, except that, in the case of an aeroplane of which the maximum total weight authorised does not exceed 2730 kg, or a helicopter, if it is not reasonably practicable for the copy of the technical log to be kept on the ground it may be carried in the aeroplane or helicopter, as the case may be, in a box approved by the Director-General for that purpose. Adequate arrangements shall be made to extract information recorded in the Technical Log for use by the maintenance organisation and component overhaul organisation.

4.2 All entries in the Technical Log shall be retained by the operator for a period not less than two years after the particular aircraft has been destroyed or permanently withdrawn from service except that the Director-General may consider a different retention period in a particular case.
SECTION 1.7

SUB-SECTION 1.7-9

MODIFICATION RECORD BOOK

1 INTRODUCTION

1.1 The Modification Record Book is a statement of the modification history of the aircraft to which it relates.

1.2 A Modification Record Book must be kept for each aircraft of more than 2730 kg maximum authorised weight, registered in Hong Kong.

NOTE: The word 'aircraft' used in the context of this Sub-section, does not apply to engines and propellers where suitable modification records are maintained in appropriate log books. The Modification Record Book is considered an addition to the aircraft log book.

1.3 Modification Record Books may be purchased from the CAD Airworthiness Office.

2 CONTENTS OF THE MODIFICATION RECORD BOOK

The following shall be recorded in the Modification Record Book:-

(a) Modifications made to those parts of the aircraft on which airworthiness depends.

(b) Modifications made to the aircraft which affect modifications already listed in the Record Book.

(c) Major repairs, which have significantly altered the design affecting the airworthiness of the aircraft.

3 COMMENCING AND MAINTAINING THE MODIFICATION RECORD BOOK

3.1 New Aircraft Initially Registered in Hong Kong

The applicant for issue of a Hong Kong Certificate of Airworthiness (see
Sub-section 1.3-2), shall obtain from the aircraft constructor information necessary to comply with the requirements of this Sub-section relevant to commencement for these aircraft, by stating the modification embodied, additional to the basic design, at the time of certification.

3.2 Used Aircraft

The applicant for the issue of a Hong Kong Certificate of Airworthiness (see Sub-section 1.3-2) for a used aircraft shall be responsible for starting a Modification Record Book at the time of Hong Kong registration, and shall, at that time, record such of the modification history of the aircraft as is considered necessary by the Director-General.

3.3 A Modification Record Book which is valid in the exporting country, and supplied with an aircraft to be imported and registered in Hong Kong, may be acceptable in place of the Modification Record Book required by this Sub-section. Such a book shall be certified as accurate and up to date by the competent airworthiness authorities of the exporting country, and shall be acceptable to the Director-General in all other particulars.

3.4 The Modification Record Book must be up to date at the issue of the Certificate of Airworthiness for a new aircraft, at the renewal of the Certificate (see Sub-section 1.3-4), and at the time of sale or lease of the aircraft.

3.5 The Modification Record Book shall be kept by the owner or operator of the aircraft, and shall be made available for examination, when required by the Director-General.
SECTION 1.7
SUB-SECTION 1.7-10
WEIGHT AND BALANCE REPORT

INTRODUCTION

This Sub-section 1.7-10 contains guidance for compiling Weight and Balance Reports and Weight and Centre-of-Gravity Schedules as required by Sub-section 1.5-4.

1 WEIGHT AND BALANCE REPORT - AIRCRAFT EXCEEDING 5700 KG

1.1 A Weight and Balance Report shall be produced for each Prototype, Variant and Series aircraft, the Maximum Weight Authorised of which exceeds 5700 kg.

1.2 The Weight and Balance Report shall record such loading data as is essential to enable the particular aircraft to be correctly loaded, and shall include sufficient information for an operator to produce written loading instructions in compliance with the requirements of the Air Navigation (Hong Kong) Order 1995.

1.3 The Weight and Balance Report shall apply to the aircraft in the condition in which it is to be delivered to the user.

1.4 One copy of the Weight and Balance Report shall be sent to the CAD Airworthiness Office.

1.5 The Weight and Balance Report shall include the following items:-

(a) Reference number and date.

(b) Designation, nationality, and registration marks of the aircraft, or if these are not known, the constructor’s serial number.

(c) A copy of the Weighing Record, produced in accordance with Sub-section 1.5-4, paragraph 3.5.
HKAR-1

(d) A copy of the Weight and Centre-of-Gravity Schedule including the list of Basic Equipment, if this is separate from Part A of the Schedule (see paragraph 2.7.2).

(e) A diagram and a description of the datum points which are used for weighing and loading and an explanation of the relationship of these points to the fuselage frame numbering system or other identifiable points, and, where applicable, to the standard mean chord (SMC).

(f) Information on the lever arms appropriate to items of Disposable Load. (This should include the lever arms of fuel, oil and other consumable fluids or substances in the various tanks (including agricultural material in hoppers), which, if necessary, should be shown diagrammatically or graphically; lever arms of passengers in seats appropriate to the various seating layouts; mean lever arms of the various baggage holds or compartments).

(g) Details of any significant effect on the aircraft Centre-of-Gravity (C.G.) of any change in configuration, such as retraction of the landing gear.

2 WEIGHT AND CENTRE-OF-GRAVITY SCHEDULE - AIRCRAFT EXCEEDING 2730 kg (see Sub-section 1.7-10 Appendix No. 1)

A Weight and Centre-of-Gravity Schedule shall be provided for each aircraft, the Maximum Total Weight Authorised of which exceeds 2730 kg, except that for an aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg, the information contained in Parts B and C of the Schedule may, for a new aircraft, be given as part of the Weight and Balance Report.

NOTES: (1) The Weight and Centre-of-Gravity Schedule may be in the form set down in Sub-section 1.7-10 Appendix No. 1, but variations are permitted within the Requirements.

(2) Where reference is made in Sub-section 1.7-10 Appendix No. 1 to the Flight Manual, but such a document has not been issued, it will be necessary to refer to the Certificate of Airworthiness.
2.1 Each Schedule shall be identified by the aircraft designation, nationality and registration marks, or if these are not known, by the constructor's serial number. The date of issue of the Schedule shall be given and the Schedule shall be signed by a representative of an approved organisation or a person acceptable to the Director-General. A statement shall be included indicating that the Schedule supersedes all previous issues.

2.2 The date and reference number of the Weight and Balance Report, or, as appropriate to the weight, other acceptable information upon which the Schedule is based, shall be given.

NOTE: For aircraft for which a Weight and Balance Report is not mandatory, the Weighing Record would normally be used (see Sub-section 1.5-4, paragraph 3.5).

2.3 A copy of each issue of the Schedule shall be retained by the operator, and where the Schedule is re-issued the previous issue shall be retained with the aircraft records. A copy of the current Schedule and any related list of Basic Equipment (see paragraph 2.7), shall be sent to the CAD Airworthiness Office.

2.3.1 For aircraft, the Maximum Total Weight Authorised of which does not exceed 5700 kg, a copy of the Schedule shall be included in the Flight Manual, if a Flight Manual is applicable, or if this is not the case, displayed or retained in the aircraft in a suitably identified stowage.

2.4 Operators shall issue a revised Weight and Centre-of-Gravity Schedule when the weight and C.G. is known to have changed to an extent greater than that which has been agreed by the Director-General as applicable to a particular aircraft type.

2.5 If the aircraft has not been re-weighed, the revised Weight and Centre-of-Gravity Schedule shall contain a statement that calculations have been based on the last Weight and Balance Report, or other information (see paragraph 2.2), and the known weight and C.G. changes.

2.6 The datum to which the C.G. limits relate is defined in Part A (see paragraph 2.7) and this may be different from the datum defined in the Certificate of Airworthiness or Flight Manual. When a different datum is used it shall be adequately defined, its precise relationship to the datum in the Certificate of Airworthiness or Flight Manual shall be given, and any lever arms and moments which appear in any part of the Schedule shall be consistent with the datum so declared.
NOTE: In the case of helicopters, it may be necessary to present lever arms and moments about more than one axis, depending on the C.G. limits specified in the Flight Manual.

2.7 **Part A Basic Weight**

The Basic Weight and the associated position of the C.G. of the aircraft as derived from the most recent Weight and Balance Report or other information together with any subsequent weight and C.G. changes, shall be stated. The position (retracted or extended) of the landing gear associated with this information shall be stated.

2.7.1 Where the Maximum Total Weight Authorised does not exceed 5700 kg, Part A shall also include the list of Basic Equipment showing the weight and lever arm of each item, or this information may form separate pages attached to the Weight and Centre-of-Gravity Schedule, with a suitable reference in Part A of the Schedule to this procedure.

2.7.2 Where the Maximum Total Weight Authorised exceeds 5700 kg, Part A shall include the list of Basic Equipment showing the weight, lever arm and moment of each item, or shall make reference to the document in which such a list is included.

2.8 **Part B Variable Load**

The Variable Load may be detailed for as many roles as the operator wishes, but for every role the weights and moments shall be given. Weights of crew members may be assumed to be not less than the weights shown in the Air Navigation (General) Regulations, provided that the Maximum Total Weight Authorised exceeds 5700 kg, or the aircraft has a total seating capacity for 12 or more persons. Otherwise the weight of each person must be determined by weighing.

2.9 **Part C Loading Information**

This shall include all relevant information so that, knowing the Disposable Load which is intended to be carried, the weight and the position of the C.G. of the aircraft can be calculated. At least the following shall be given:

(a) The lever arm of the C.G. of a passenger in each seat.

(b) The mean lever arm of each compartment or area in the aircraft
where Disposable Load, such as luggage or freight, may be placed.

(c) Any significant change in the C.G. of the aircraft (change in moment) which will result from a change in configuration, such as the retraction and extension of the landing gear.

(d) The lever arm of the C.G. of fuel, oil and other consumable fluids or substances in each tank, including any significant variation of the lever arm with the quantity loaded.

(e) The maximum total usable capacities of the tanks for fuel, oil and other consumable fluids or substances and the weight of fluids or substances when the tanks are filled to their capacities assuming typical densities.

2.10 A statement shall be made in the Schedule to the effect that it is a requirement of the Air Navigation (Hong Kong) Order 1995 that the commander satisfies himself before take-off that the load is of such weight, and is so distributed and secured, that it may safely be carried on the intended flight.

2.11 The weights, distances, moments and quantities may be given in any units provided that these are used consistently and do not conflict with the markings and placards on the aircraft.

3 WEIGHT AND CENTRE-OF-GRAVITY SCHEDULE - AIRCRAFT NOT EXCEEDING 2730 kg (see Sub-section 1.7-10 Appendix No.2, paragraph 1)

For aircraft, the Maximum Total Weight Authorised of which does not exceed 2730 kg, either a Weight and Centre-of-Gravity Schedule which complies with paragraphs 2 and 3.2, or a Loading and Distribution Schedule which complies with paragraph 3.1 shall be provided.

3.1 Loading and Distribution Schedule (See Sub-section 1.7-10 Appendix No.2, paragraph 2)

3.1.1 The Loading and Distribution Schedule (hereinafter in this paragraph 3.1 referred to as 'the Schedule') shall contain at least the information in Sub-section 1.7-10 Appendix No.2.
3.1.2 Each Schedule shall be identified by the aircraft designation, nationality and registration marks, or if these are not known, by the constructor’s serial number.

3.1.3 A copy of each issue of the Schedule shall be retained by the operator, and when the Schedule is re-issued the previous issue shall be retained with the aircraft records. A copy of the current Schedule and any related list of Basic Equipment shall be sent to the CAD Airworthiness Office.

3.1.3.1 A copy of the Schedule shall be included in the Flight Manual, if a Flight Manual is applicable, or, if this is not the case, the Schedule shall be displayed or retained in the aircraft in a suitably identified stowage.

3.1.4 Operators shall issue a revised Schedule when:-

(a) the Basic Weight of the aircraft is known to have undergone changes in excess of 0.5% of the Maximum Total Weight Authorised, or

(b) the total moment applicable to the Basic Weight is known to have changed to an extent greater than that which has been agreed by the Director-General as applicable to a particular aircraft type.

3.1.5 If the aircraft has not been re-weighed the revised Schedule shall contain a statement that calculations have been based on the last Weighing Record and the known weight and moment changes.

3.1.6 Instructions for the use of the Schedule, together with the Loading Graphs, shall be included.

3.1.7 A statement shall be given in the Schedule to the effect that it is a requirement of the Air Navigation (Hong Kong) Order 1995 that the commander satisfies himself before the aircraft takes off that the load is of such a weight, and is so distributed and secured that it may safely be carried on the intended flight.

3.1.8 The weight, distances, moments and quantities may be given in any units provided that these are used consistently and do not conflict with the markings and placards on the aircraft.
3.1.9 **Part A Basic Data**

Part A shall contain the following:-

(a) The Basic Weight and the associated moment, and C.G. position of the aircraft, as derived from the most recent Weighing Record, together with any subsequent changes.

(b) The Maximum Total Weight Authorised appropriate to each permitted use (e.g. aerobatics).

(c) The definition of the C.G. datum.

(d) The date and reference number of the Weighing Record and list of Basic Equipment upon which the Schedule is based.

(e) The date and reference of the Loading Graphs of the Loading and Distribution Schedule shall be given.

(f) A statement of the date of preparation and validity of the Schedule, signed by a representative of an approved organisation, or a person acceptable to the Director-General. A statement shall also be included indicating that the Schedule supersedes all previous issues.

3.1.10 **Part B Loading**

Columns shall be provided which list all standard items of Variable Load and make provision for the associated weight and C.G. moments to be recorded and totalled for a particular flight. Columns shall also be provided for recording an example of a typical aircraft loading calculation. This example shall employ the same weight and C.G. moment figures as recorded in the Loading Graphs (see paragraph 3.1.11).

3.1.11 **Part C Loading Graphs**

Graphs, sufficient to ascertain moments, and to enable the operator to determine that the aircraft loaded weight and C.G. moment are within the prescribed limits shall be provided. The graphs shall be identified by aircraft designation, date of compilation and source. Suitable sources are the aircraft constructor or other competent person. An example application shall be included using the same
figures as employed in the Loading and Distribution Schedule example.

3.2 **Weight and Centre-of-Gravity Schedule** (See Sub-section 1.7-10 Appendix No.2, paragraph 3)

In addition to compliance with paragraph 2 the Weight and Centre-of-Gravity Schedule for aircraft, the Maximum Total Weight Authorised of which does not exceed 2730 kg, shall contain instructions for the determination of the loaded weight, the total load moments and resultant C.G. positions.
APPENDIX NO. 1 TO SUB-SECTION 1.7-10

WEIGHT AND CENTRE-OF-GRAVITY SCHEDULES FOR AIRCRAFT EXCEEDING 2730 kg

1 INTRODUCTION (see Sub-section 1.5-4, paragraph 5)

This Sub-section 1.7-10 Appendix No. 1 presents a specimen Weight and C.G. Schedule which constitutes an acceptable means of compliance with the appropriate requirements of Sub-section 1.5-4, paragraph 5, and where elected with Sub-section 1.5-4, paragraph 6.

NOTE: Imperial Units are shown on the specimen. Where it is necessary to use S.I. Units these should be used throughout.

SPECIMEN SCHEDULE

Reference : NAL/286
Produced by : Loose Aviation Ltd.
Aircraft Designation : Flynow 2E
Nationality and Registration Marks : B-HZZ
Constructor : F.L.Y. Co. Ltd.
Constructor's Serial Number : 44
Maximum Total Weight Authorised : 7300 lb
Centre-of-Gravity Limits : Refer to Flight Manual reference number 90/946

PART A BASIC WEIGHT

The Basic Weight of the aircraft as calculated from Weight and Balance Report/Weighing Record*

(*) Delete as appropriate.

NAL/E/95 dated 31 August 1988 is : 5516 lb
The C.G. of the aircraft in the same condition at this weight and with the landing gear extended is : 127 in aft of datum
The total moment about the datum in this condition in lb in/100 is : 7015
NOTE: The datum is at fuselage station 0 situated 114 inches forward of the wing leading edge. This is the datum defined in the Flight Manual. All lever arms are distances in inches aft of datum.

The Basic Weight includes the weight of 5 gal unusable fuel and 1 gal unusable oil and the weight of the following items which comprise the list of Basic Equipment:-

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>LEVER ARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(lb)</td>
<td>(in)</td>
</tr>
<tr>
<td>Two Marzell propeller type BL-H3Z30</td>
<td>127 each</td>
</tr>
<tr>
<td>Two engine driven 100 ampere alternators type GE-361</td>
<td>27 each</td>
</tr>
<tr>
<td>One 13 Ah Ni-Cd battery CB-7</td>
<td>31</td>
</tr>
<tr>
<td>etc.</td>
<td>etc.</td>
</tr>
</tbody>
</table>

PART B VARIABLE LOAD

The weight, lever arms and moments of items of Variable Load are shown below. The Variable Load depends upon the equipment carried for the particular role.

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>LEVER ARM</th>
<th>MOMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(lb)</td>
<td>(in)</td>
<td>(100 lb in)</td>
</tr>
<tr>
<td>Pilot (one)</td>
<td></td>
<td>108</td>
</tr>
<tr>
<td>De-icing fluid 1.5 gal</td>
<td>12</td>
<td>140</td>
</tr>
<tr>
<td>Life-jackets (7)</td>
<td>14</td>
<td>135</td>
</tr>
<tr>
<td>Row 1 passenger seats (two)</td>
<td>60</td>
<td>173</td>
</tr>
<tr>
<td>Row 2 passenger seats (two)</td>
<td>60</td>
<td>215</td>
</tr>
<tr>
<td>Row 3 passenger seats (two)</td>
<td>60</td>
<td>248</td>
</tr>
<tr>
<td>Table</td>
<td>8</td>
<td>256</td>
</tr>
<tr>
<td>One stretcher and attachments</td>
<td>45</td>
<td>223</td>
</tr>
<tr>
<td>(in place of seat rows 2 and 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical stores</td>
<td>15</td>
<td>250</td>
</tr>
</tbody>
</table>

31 January 2009

1.7-10 A1 P.2

Issue 2
PART C   LOADING INFORMATION (DISPOSABLE LOAD)

The total moment change when the landing gear is retracted in lb in/100 is : -18.

The appropriate lever arms are:-

<table>
<thead>
<tr>
<th>WEIGHT (lb)</th>
<th>LEVER ARM (in)</th>
<th>CAPACITY (Imp. gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel in tanks 1 and 2</td>
<td>1368*</td>
<td>145</td>
</tr>
<tr>
<td>Engine Oil</td>
<td>50*</td>
<td>70</td>
</tr>
<tr>
<td>Forward baggage</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>Rear baggage</td>
<td></td>
<td>261</td>
</tr>
<tr>
<td>Passengers in Row 1 seats</td>
<td></td>
<td>171</td>
</tr>
<tr>
<td>Passengers in Row 2 seats</td>
<td></td>
<td>213</td>
</tr>
<tr>
<td>Passengers in Row 3 seats</td>
<td></td>
<td>246</td>
</tr>
<tr>
<td>Patient in stretcher</td>
<td></td>
<td>223</td>
</tr>
</tbody>
</table>

NOTE: To obtain the total loaded weight of aircraft, add to the Basic Weight the weights of the items of Variable and Disposable Load to be carried out for the particular role.

(*) Densities - Petrol 7.2 lb/Imp.gal; Kerosene 8.1 lb/Imp.gal; oil 9.0 lb/Imp.gal.

This Schedule was prepared (date) ........................... and supersedes all previous issues.

Signed .................................................................... Inspector/Engineer

on behalf of .......................................................................................

Approval Reference .............................................................................

In accordance with AN(HK)O 1995, it is a requirement that the pilot satisfies himself before take-off that the load is of such a weight, and is so distributed and secured, that it may safely be carried on the intended flight. Full conformity with the instructions contained in this document will ensure compliance with the Flight Manual in respect of aircraft loading.

Issue 2 1.7-10 A1 P.3 31 January 2009
NOTE: (Not part of the specimen Schedule) In Part B, Variable Load, of this Schedule the actual weight of the pilot is required in accordance with the Air Navigation (General) Regulations for aircraft the Maximum Total Weight Authorised of which does not exceed 5700 kg or with less than 12 persons seating capacity. Hence the pilot’s weight and calculated moment are omitted in the example.
APPENDIX NO. 2 TO SUB-SECTION 1.7-10

WEIGHT AND CENTRE-OF-GRAVITY AND LOADING AND DISTRIBUTION SCHEDULES FOR AIRCRAFT NOT EXCEEDING 2730 kg

1 INTRODUCTION (See Sub-section 1.5-4, paragraph 6)

This Appendix No. 2 contains acceptable means of compliance in respect of Weight and Centre-of-Gravity and Loading and Distribution Schedules provided in accordance with Sub-section 1.5-4, paragraph 6.

2 LOADING AND DISTRIBUTION SCHEDULE (See Sub-section 1.5-4, paragraph 6).

The Schedule (including the graphs) and the List of Basic Equipment should, as far as is practical, take the form of Figures 1, 2 and 3.
AIRCRAFT LOADING AND DISTRIBUTION SCHEDULE FOR AIRCRAFT NOT EXCEEDING 2730 kg

Aircraft Type: 
Aircraft Registration or Constructor's Serial No.: 
Aircraft Nationality: 

PART A BASIC DATA

<table>
<thead>
<tr>
<th>ITEM</th>
<th>WEIGHT</th>
<th>MOMENT</th>
<th>C.G. POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Aircraft</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTWA</td>
<td>Normal Use</td>
<td>The C.G. datum is defined as ..................................................</td>
<td></td>
</tr>
<tr>
<td>Aerobatic Use</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Basic Aircraft Weight and C.G. Position were determined from the following documents contained in the aircraft records.
(a) Weighing Record Ref: ................. Date: .....................
(b) Basic Equipment List Ref: ................. Date: .....................
(c) Loading and Distribution Charts Figs. 1 and 2 Ref: ................. Date: .....................

This Schedule was prepared and the Loading and Distribution Charts Figs. 1 and 2 were current on ............................................................... and supersede all previous issues.
Signed ..........................................................
Authority ..................................................

PART B LOADING

1. To obtain moments of items, refer to Fig. 1 and read off moment from corresponding weight. Repeat this for all items of load, and record both weight and moment in the appropriate columns below.
2. Total the weight column. TOTAL THE MOMENT COLUMNS, ASCERTAIN THE RESULTANT MOMENT, and apply the results to Fig. 2 in order to ascertain that the resulting intersection point falls within the permissible loading envelope, appropriate to the certification Category. The envelope(s) take account of fuel usage in flight. Examples of the use of the Figures are shown by arrowed lines.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>EXAMPLE AIRCRAFT</th>
<th>YOUR AIRCRAFT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WEIGHT</td>
<td>MOMENT</td>
</tr>
<tr>
<td></td>
<td>(+)</td>
<td>(-)</td>
</tr>
<tr>
<td>Basic Weight (see Part A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel – Standard (@7.2lb/imp gallon)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(@6.0lb/imp gallon)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot and Passenger (Row 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger (Row 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger (Row 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baggage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTALS OF MOMENTS

TOTAL WEIGHT & RESULTANT MOMENT

In accordance with the AN(HK)O 1995 as amended, it is a requirement that the pilot satisfies himself before take-off that the load is of such a weight, and is so distributed and secured, that it may safely be carried on the intended flight. Full conformity with the instructions contained in this document will ensure compliance with the Flight Manual in respect of aircraft loading.

Figure 1 (Sub-section 1.7-10 Appendix No.2) FRONT OF SCHEDULE
Figure 2 (Sub-section 1.7-10 Appendix No.2) REVERSE OF SCHEDULE
PART A  BASIC DATA

1. The aircraft is as defined in Type Certificate Data Sheet (or equivalent) ...................................................
2. The Weighing Record from which the Basic Aircraft Weight is calculated is
   Ref: ..................................................    Date: .............................................
3. The Basic Aircraft Weight is ................................... made up as follows:-
   (a) Basic aircraft, including standard equipment (e.g. seat lap straps)
   (b) Items of non-standard equipment, as listed in Part B.
4. The moment of the aircraft as at item 3 is ..........................................................

PART B  NON-STANDARD EQUIPMENT INCLUDED IN WEIGHT STATED IN PART A

<table>
<thead>
<tr>
<th>ITEM</th>
<th>WEIGHT</th>
<th>MOMENT</th>
<th>DATE OF CHANGE OR EMBODIMENT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(+)</td>
<td>(-)</td>
<td></td>
</tr>
</tbody>
</table>

PART C  NON-STANDARD EQUIPMENT NOT INCLUDED IN WEIGHT STATED IN PART A

NOTE: When re-calculation of Basic Aircraft Weight is made (see Sub-section 1.5-4), items in Part C should be included in the re-calculation and moved to part B
Figure 3 (Sub-section 1.7-10 Appendix No.2) LIST OF BASIC EQUIPMENT
WEIGHT AND CENTRE-OF-GRAVITY SCHEDULE (See Sub-section 1.7-10, paragraph 3.2)

An acceptable means of compliance with Sub-section 1.7-10, paragraph 3.2 would be to include in the Schedule instructions on the following lines:-

<table>
<thead>
<tr>
<th>SPECIMEN INSTRUCTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. By reference to Weight and Centre-of-Gravity Schedule, ascertain the lever arm of each item (Basic Weight, Variable Load, Disposable Load).</td>
</tr>
<tr>
<td>2. To obtain moment of an item, multiply the weight of the item by the corresponding lever arm, and record the moment for each item of load, giving the moment a positive sign if the item is aft of the datum, and a negative sign if it is forward of the datum. Enter the weight of the item in the weight column.</td>
</tr>
<tr>
<td>3. Total the weight column.</td>
</tr>
<tr>
<td>4. Total the moment columns. If (+) and (-) moments are recorded total each column and obtain the total resultant moment, by subtracting the lesser from the greater.</td>
</tr>
<tr>
<td>5. Divide the total (or total resultant) moment by the total weight to obtain C.G. position, positive or negative, relative to the datum, and check that this is within the prescribed C.G. limits.</td>
</tr>
<tr>
<td>6. To check that the fuel consumed during a flight does not cause the C.G. position to be outside the prescribed limits, re-total the weights in 3 and the moments in 4, but omitting the total fuel weight and the corresponding moment(s), respectively. Add the weight and moment of the fuel expected to remain in the tanks at the end of the flight. Divide the final total resultant moment by the final total weight to obtain the C.G. position, and check that it is still within the prescribed C.G. limits.</td>
</tr>
</tbody>
</table>

NOTE: Where there are any other significant quantities of consumable fluids or substances (e.g. crop spraying), similar account should be taken of them.
Section 1.8

Approvals
1 INTRODUCTION An Organisation may be Approved to certify that aeronautical materials and/or parts have been processed (e.g. protective and heat treatments) and inspected in conformity with acceptable standards/specifications and Hong Kong airworthiness requirements, subject to compliance with the procedures set out in this Sub-section 1.8-5. The Approval, when granted, will apply to the whole Organisation headed by the Chief Executive.

2 APPLICATION CAD Form DCA 61, copies of which may be obtained from the CAD Airworthiness Office, shall be completed and returned to the same address.

3 REQUIREMENTS FOR THE GRANT OF APPROVAL

3.1 The applicant for approval shall nominate the following persons:-

(a) A senior person whose functions will include co-ordination of all appropriate departments to ensure compliance with the relevant airworthiness requirements and the technical content of customers' order insofar as airworthiness may be affected. Such person shall be directly responsible to the Chief Executive.

(b) Departmental heads and other senior members of staff as appropriate to the class of work for which Approval is sought.

(c) Signatories to Approved Certificates.

3.2 The applicant shall provide an Exposition (see Sub-section 1.8-2 Appendix No. 1) of the Organisation, including the following information:-

(a) The terms of reference of senior technical personnel, as applicable to activities under the Approval.

(b) The associated chains of responsibility.

(c) The cope of the process facility, together with information on essential inspection and test equipment.
(d) The procedures adopted for controlling all matters directly affecting compliance with standards/specifications, and other technical matters which may affect airworthiness from receipt to despatch of processed parts/materials.

(e) Any special process methods/techniques adopted by the company within specification limits.

(f) Any further matters which the Director decides are necessary arising from initial assessment or subsequent supervisory visits.

3.2.1 One copy of the exposition and of all subsequent amendments shall be supplied to the CAD Airworthiness Office, together with a copy of the distribution list.

3.3 The Organisation shall, in the opinion of the Director, be such as to ensure that, in all matters affecting airworthiness, full and efficient co-ordination exists within departments and between related departments.

3.4 The applicant shall satisfy the Director that the persons nominated in accordance with 3.1 are capable and responsible persons and written evidence of their qualifications and experience shall be supplied. The applicant shall also satisfy the Director that such persons are conversant with Hong Kong requirements and procedures insofar as they affect the particular matters for which they are responsible. The Director shall be satisfied that the management of the Organisation will be conducted with due regard to the needs of airworthiness and the character of airworthiness requirements.

3.5 The staff in all appropriate technical departments shall be of sufficient number and experience as may reasonably be expected to undertake the volume of work in the class for which approval is sought.

3.6 The staff shall be provided with adequate accommodation, facilities and equipment for the effective performance of their duties. Office, laboratory and workshop environmental conditions shall be controlled as necessary in relation to the work. Bonded and quarantine stores shall be provided, where appropriate.

3.7 The applicant shall demonstrate that the organisation has established and is able to maintain a quality system. This quality system shall be such that it enables the organisation to ensure aeronautical materials and/or parts processed by the organisation or its partners or subcontractors, conforms to
the applicable design data and is in condition for safe operation when installed on an aircraft, engine, or its related part or system.

3.8 The calibration of test equipment shall be checked as frequently as is necessary to maintain confidence in the accuracy of the equipment.

3.9 An Approved Certificate, the form of which shall be approved by the Director, shall be issued to the consignee for each batch of material related under the CAD approval. Approved Certificates shall be numbered serially at the time of bulk printing, except as otherwise agreed by the Director. The working of the certification shall be as follows:-

Certified that, unless otherwise stated above, the whole of the above-mentioned materials and/or parts have been processed and inspected in accordance with the terms of the contract/order applicable thereto and conform fully to the standards/specification quoted hereon and the requirements of Hong Kong.

Signed .............................................................................

for and on behalf or ........................................................

Date .............................................................................

3.10 Technical records shall be maintained and shall be such that proper correlation of all work carried out is established with relevant documents including the following, as appropriate:-

(a) Customer's order.

(b) Material or parts.

(c) Relevant standards/specifications.

(d) Test and Inspection records including a record of each identified (i.e. by serial number) component and item of equipment.

(e) Outgoing Approved Certificate.

3.10.1 Essential records shall not be destroyed without authorisation from the Director.
4 REQUIREMENTS FOR THE MAINTENANCE OF APPROVAL

4.1 The Organisation shall be maintained at the standard necessary to undertake the work for which it is approved and the Director shall, at all reasonable times, have access to the Organisation for the purpose of assessing the standard in use.

4.2 A proposed change of the Chief Executive shall be notified to the Director in writing. The Director may require the Organisation to supply further information in order to satisfy itself of the suitability of the official concerned insofar as it may affect the Approval of the Organisation.

4.3 Changes in the persons nominated in accordance with 3.1 shall be notified to the Director in writing for acceptance.

4.4 The Exposition required by 3.2 shall be reviewed periodically by the Organisation and any necessary amendments promulgated.

4.5 The Organisation shall consult the Director if in any difficulty about the interpretation of the Requirements or associated procedures.

4.6 The Director shall have the right to witness tests or inspections in any way associated with establishing airworthiness.

4.7 The Director may revoke, suspend or vary the Terms of Approval if, in the opinion of the Director, the conditions required for approval are not maintained.
SECTION 1.8

SUB-SECTION 1.8-6

TEST HOUSES GROUP B4

INTRODUCTION

An Organisation may be Approved to provide reports and certify that test/examination on an aircraft, engine, or related part, system, or material have been made in compliance with requirements or specifications published or accepted by the Director, subject to the procedures set out in this Sub-section 1.8-6. The approval, when granted, will apply to the whole Organisation headed by the Chief Executive.

APPLICATION

CAD Form DCA 61, copies of which may be obtained from the CAD Airworthiness Office, shall be completed and returned to the same address.

REQUIREMENTS FOR THE GRANT OF APPROVAL

3.1 The applicant for approval shall nominate the following persons:-

(a) The person in direct charge of the test house and, where applicable, a deputy.

(b) The technical director or senior executive to whom the person directly in charge of the test house is responsible.

(c) Other senior members of the test house staff and of related departments.

(d) Signatories to Approved Test Certificates.

3.2 The applicant shall provide an Exposition (see Sub-section 1.8-2 Appendix No. 1) of the Organisation, including the following information:-

(a) The terms of reference of senior technical personnel, as applicable to activities under the Approval.

(b) The associated chains of responsibility.
3.2.1 One copy of the exposition and of all subsequent amendments shall be supplied to the CAD Airworthiness Office, together with a copy of the distribution list.

3.3 The Organisation shall, in the opinion of the Director, be such as to ensure that, in all matters affecting airworthiness, full and efficient co-ordination exists within the test house, and between the test house and other departments of the company.

3.4 The Applicant shall satisfy the Director that the person in charge of the test house and his accredited deputy are capable and responsible persons, and written evidence of their qualifications and experience shall be supplied. The Director shall be satisfied that the management of the Organisation will be conducted with due regard to the needs of airworthiness and the character of airworthiness requirements, and that the persons nominated in accordance with 3.1 are conversant with Hong Kong airworthiness requirements and procedures insofar as they affect the particular matters for which they are responsible.

3.5 The test house staff shall be of sufficient number and experience as may reasonably be expected to undertake the volume of work in the class for which approval is sought.

3.6 The test house staff shall be provided with adequate accommodation, facilities and equipment for the effective performance of their duties. The calibration of test equipment shall be checked as frequently as is necessary to maintain confidence in the accuracy of the equipment, and the laboratory or test house environmental conditions shall be controlled as necessary in relation to the work. Bonded and quarantine stores shall be provided, where appropriate.

3.7 The applicant shall demonstrate that the organisation has established and is able to maintain a quality system. This quality system shall be such that it enables the organisation to ensure all materials used in testing/examining the aircraft, engine or its related parts conform to
approved specifications and is in condition for safe operation when the tested/examined parts are reinstalled on the aircraft, engine, or its related system.

3.8 An Approved Certificate, the form of which shall be approved by the Director, shall be issued to the consignee for each item tested or examined and released under the CAD approval. Approval Certificates shall be numbered serially at the time of bulk printing, except as otherwise agreed by the Director. The wording of the certification shall be as follows:-

Certified that the above mentioned specimens/parts/materials/systems* have been tested/examined in accordance with the terms of the contract/order applicable thereto and the requirements of Hong Kong relating to the testing of such specimens/parts/materials/systems*.

This Certificate does not relate to the standard or quality of manufacturer of the item/material except as may be specified in the test contract/order.

Signed .................................................................

for and on behalf of ...................................................

Date .................................................................

*Delete where inapplicable.

3.9 Test house records shall be maintained and shall be such that proper correlation of all work carried out is established with relevant documents including the following, as appropriate:-

(a) Customer's order.

(b) Item under Test/Examination.

(c) Relevant standards/specifications.

(d) Test Report including a record of each identified (i.e. by serial number) component and item of equipment.

(e) Outgoing Approved Test Certificate.

3.9.1 Suitable arrangements shall be made for checking and supervising test results and recordings. Essential records shall not be destroyed without authorisation from the Director.
4 REQUIREMENTS FOR THE MAINTENANCE OF APPROVAL

4.1 The Organisation shall be maintained at the standard necessary to undertake the work for which it is approved and the Director shall, at all reasonable times, have access to the Organisation for the purpose of assessing the standard in use.

4.2 A proposed change of the Chief Executive shall be notified to the Director in writing. The Director may require the Organisation to supply further information in order to satisfy itself of the suitability of the official concerned insofar as it may affect the Approval of the Organisation.

4.3 Changes in the persons nominated in accordance with 3.1 shall be notified to the Director in writing for acceptance.

4.4 The Exposition required by 3.2 shall be reviewed periodically by the Organisation and any necessary amendments promulgated.

4.5 The Organisation shall consult the Director if in any difficulty about the interpretation of the Requirements or associated procedures.

4.6 The Director shall have the right to witness tests in any way associated with establishing airworthiness.

4.7 The Director may revoke, suspend or vary the Terms of Approval if, in the opinion of the Director, the conditions required for approval are not maintained.
INTRODUCTION

1.1 An organisation may be approved to operate aircraft under 'B' Conditions as prescribed in Schedule 2 of the Air Navigation (Hong Kong) Order 1995 subject to any conditions specified by the Director-General in such approval. The aircraft may fly without a Certificate of Airworthiness or Permit to Fly being in force. The aircraft may fly without being registered.

1.2 Approvals under the provision of this Sub-section 1.8-9 are granted in one or more of the following groups:

F1 An approval granted to an organisation approved for the full management and control of flights under 'B' Conditions.

F3 An approval granted to an organisation for the management and control of flights under 'B' Conditions for the purposes of a specified test or development programme of defined scope and specified duration.

F4 An approval granted to an organisation for the management and control of flights under 'B' Conditions for the purposes of a specified test or development programme of defined scope and specified duration, where the applicant determines and the Director-General agrees that there are no significant flight safety implications.

G1 An approval granted to an organisation for the approval of flight test personnel, facilities and procedures to support flight testing carried out under 'B' Conditions.

1.3 Each approval group is discrete such that, for example, a Group F1 approval does not include Group F3 or F4 privileges. It is possible however, for an organisation to be approved in more than one group.
1.4 The Schedule of Approval may restrict the organisation to a limited scope, aircraft category, or specific aircraft dependent upon the flight test expertise retained and the relative complexity of the projects undertaken.

2 APPLICATION

2.1 Application for Group F4 approval under Sub-section 1.8-9 shall be made by letter to the Director-General.

2.2 Application for other Group approvals under Sub-section 1.8-9 shall be made on Form DCA61 or DCA456, copies of which may be obtained from the CAD Airworthiness Office.

3 REQUIREMENTS FOR GRANT OF APPROVAL

3.1 **Group F1** approval may only be granted to an organisation, which meets the requirements of this Sub-section 1.8-9 and holds an approval in Groups E2 and A2 in accordance with the requirements of HKAR-1 Sub-section 1.8-8 and 1.8-2 respectively. Approvals granted under JAR-21, FAR-21 or EASA Part 21 may be accepted in lieu of a HKAR-1 approval. The organisation shall provide an organisation exposition containing the particulars identified in Appendix 3 to this Sub-section 1.8-9. The organisation shall, in the opinion of the Director-General, be such as to ensure that, in all matters affecting airworthiness and flight testing, full and efficient co-ordination exists within departments and between related departments.

3.2 **Group F3** approval may only be granted to an organisation which meets the requirements of this Sub-section 1.8-9 and holds an approval in Group E2 in accordance with the requirements of HKAR-1 Sub-section 1.8-8. Approvals granted under JAR-21, FAR-21 or EASA Part 21 may be accepted in lieu of a HKAR-1 approval. The organisation shall provide an organisation exposition containing the particulars identified in Appendix 4 to this Sub-section 1.8-9, as necessary to the proposed task, and detailing how the interfaces between the flight test, design and quality management functions are managed by the organisation who will be the Group F3 approval holder. The duration of the approval will not normally exceed 12 months and will be cancelled on completion of the programme. The organisation shall, in the opinion of the Director-General, be such as to ensure that, in all matters affecting airworthiness and flight testing, full and efficient co-ordination exists within departments and between related departments.

31 January 2009 1.8-9 P.2 Issue 2
3.3 **Group F4** approval may only be granted to an organisation which meets the requirements of this Sub-section 1.8-9. There shall be a substantiation of, and proper correlation between, all the data comprising the design; this shall be at least sufficient to allow a determination to be made that there are no significant flight safety implications. The organisation shall provide a compliance and control statement containing the particulars identified in Appendix No. 1 to this Sub-section 1.8-9. The duration of the approval will not normally exceed 3 months and will be cancelled on completion of the programme. The organisation shall satisfy the Director-General that full and efficient co-ordination exists between the persons identified under paragraph 3.6.2 of this Sub-section 1.8-9, and that they understand their roles and responsibilities.

3.4 **Group G1** approval may only be granted to an organisation which meets the requirements of this Sub-section 1.8-9. To carry out flights under 'B' Conditions, such a Group G1 organisation will form an association with either a Group F1, F3 or F4 organisation. The organisation shall provide an organisation exposition containing the particulars identified in Appendix No. 2 to this Sub-section 1.8-9. The organisation shall, in the opinion of the Director-General, be such as to ensure that, in all matters affecting airworthiness and flight testing, full and efficient co-ordination exists within departments and between related departments.

3.5 **General Requirements**

3.5.1 **Elements of Approval**

Any approval to conduct flights under 'B' Conditions requires the availability of suitable and appropriately approved personnel, facilities and procedures for the control of the principal aspects of flight under 'B' Conditions. These shall include the following elements:

(a) **Flight** – to conduct safe flight operations.

(b) **Design** – to determine the areas where flight testing has to be undertaken and provide information on the appropriate conditions and limitations and also to control the aircraft build standard or modification state. The conditions shall include specification of any additional maintenance of the aircraft arising from development or modification.

(c) **Airworthiness and Inspection** – to ensure compliance with the requisite build standard or modification state (embracing
manufacture, inspection and installation) and adequate maintenance of the aircraft whilst operating under 'B' Conditions.

(d) **Quality Management** – an independent quality system that will by means of auditing ensure that the organisation (embracing Flight, Design, Airworthiness/Inspection) operates in accordance with established procedures and remains in compliance with this Sub-section 1.8-9.

The relative strengths of these four elements may vary according to the nature of the work undertaken. (See Appendices to this Sub-section 1.8-9). The applicant may form an association with other approved organisations to meet the requirements of the approval.

### 3.5.2 Essential Procedures

Procedures must be documented and agreed with the Director-General to address the following:

(a) **Airworthiness**

The holder of an approval granted under this Sub-section 1.8-9 shall not allow an aircraft to fly unless he is satisfied that the aircraft is in every way fit for flight.

(b) **Conduct of Flights**

Flights shall only be undertaken in accordance with the Air Navigation (Hong Kong) Order 1995 supplemented by such procedures as the approval holder considers necessary and which are accepted by the Director-General. Applicants shall ensure that aerodromes used for flying under 'B' Conditions are suitable for the testing proposed.

(c) **Safety Provisions for Test Flying**

For all test flying under 'B' Conditions, the approval holder must consider the need for special equipment for the purposes of the safety of the trials, e.g. harnesses, parachute stowages, emergency exits, anti-spin parachutes, instrumentation and the means for disconnecting automatic devices.
(d) **Certificate of Clearance**

An aircraft shall not fly on any test flight unless an appropriate Certificate of Clearance is completed by the approval holder.

3.5.3 **Optional Procedures**

Where it is intended that the activities, identified in this paragraph, are to be undertaken the organisation exposition must contain procedures to address them.

**Air Displays**

**Group F1 or F3 Approval** – Before an aircraft may participate in an air display in accordance with Schedule 2 of the Air Navigation (Hong Kong) Order 1995, the approval holder shall ensure that the aircraft build standard, operating limitations and display profile have been agreed to by the Director-General.

**Group F4 Approval** – Display flying is not permitted under a Group F4 approval.

3.5.4 **Foreign Registered Aircraft**

Arrangements for flight testing by a HKAR-1 Sub-section 1.8-9 approval holder, of aircraft registered in a state/place other than Hong Kong shall be agreed in writing with the Authority of the State of Registry. The aircraft is to be maintained, operated and (if necessary) modified in a manner acceptable to the authority of the State of Registry as well as being conducted in accordance with the organisation exposition.

3.6 **Nomination of Persons for Acceptance by the Director-General**

For each person nominated under this paragraph, a form DCA61A shall be submitted to the Director-General.

For the head of the flight test function and all flight test aircrew, the following additional particulars are required:

(a) Licences held;
(b) Particulars of flight training;
(c) Aircraft types on which in current flying practice;
(d) Total hours on each type;
(e) Test flying qualifications and experience.

3.6.1 **Group F1 or F3 Approval**

The applicant for approval shall nominate for acceptance by the Director-General:

(a) The individual accountable for ensuring compliance with the requirements of this Sub-section 1.8-9 whose function will include co-ordination between all organisations involved;

(b) Signatories to certificates and schedules required by this Sub-section 1.8-9.

3.6.2 **Group F4 Approval**

The applicant for approval shall nominate for acceptance by the Director-General:

(a) The individual accountable for ensuring compliance with the requirements of this Sub-section 1.8-9 whose function will include co-ordination between all organisations involved.

(b) Signatories to certificates and schedules required by this Sub-section 1.8-9.

The applicant shall be satisfied the persons nominated hold the appropriate licences and approvals and are otherwise suitably qualified.

3.6.3 **Group G1 Approval**

The applicant for approval shall nominate for acceptance by the Director-General:

(a) Flight test aircrew involved in the provision of flight test services.
(b) Signatories to certificates and schedules required by this Sub-section 1.8-9.

3.7 Flight Crew

The number and qualifications (including licences where applicable) of the minimum flight crew shall be subject to agreement between the organisation and the Director-General for each type or category of aircraft (as appropriate) concerned.

NOTE: This arrangement will not prejudice the minimum flight crew finally specified in the Flight Manual.

3.8 Certificate of Clearance

3.8.1 Group F1 or F3 Approval (see Appendix No. 3 or 4 to Sub-section 1.8-9 as applicable)

(a) All flights under 'B' Conditions shall be covered by a Certificate of Clearance, the form of which shall be agreed to by the Director-General. There shall be procedures in place to ensure that the Certificate of Clearance is amended, or replaced by a new certificate, whenever a change is made to the aircraft design standard or to any document or action referenced by the Certificate of Clearance.

(b) Before flight of an aircraft under 'B' Conditions, the Certificate of Clearance shall be signed by approved persons from each of the following functions, as defined in paragraph 3.5.1:

(i) Design;

(ii) Airworthiness and Inspection (as applicable for build standard and maintenance);

(iii) Flight (aircraft commander) and test pilot, if appropriate;

(iv) Quality Management.

Where the organisation responsible for the control and management of the 'B' Conditions project has employed another suitably approved organisation to carry out one or more of the elements required, then the signatory to the Certificates of Clearance shall sign under the approval of their own
organisation and state the applicable approval reference. It is expected that at least the signatory for the Quality Management and Design elements will be under the approval authority of the applicant.

(c) The persons signing the Certificate of Clearance shall ensure that the information provided is adequate to enable the crew to carry out the proposed flights. Before the crew undertakes the flight, they shall be satisfied with the adequacy of the information provided, and the aircraft commander shall sign the Certificate of Clearance.

3.8.2 Group F4 Approval (see Appendix No. 1 to Sub-section 1.8-9)

(a) All flights under 'B' Conditions shall be covered by a Certificate of Clearance as defined in Appendix No. 1 to this Sub-section 1.8-9.

(b) Prior to the completion of a Certificate of Clearance the applicant shall have supplied to the Director-General for review any data, reports, or other substantiation of airworthiness that the Director-General may require, together with a flight test schedule.

(c) The Certificate of Clearance shall:

(i) be signed by an approved person from the appropriate design function to certify the design standard and the flight test schedule for flight, or

(ii) reference a document signifying Director-General's acceptance of the design standard and the flight test schedule for flight.

(d) The Certificate of Clearance shall be signed by a person acceptable to the Director-General to certify that all necessary actions embracing maintenance, installation and inspection have been completed prior to flight and that the aircraft is in conformance with the defined design standard. (See Appendix No. 1 sub-paragraph 2.1.2 (c)).

(e) The Certificate of Clearance shall be signed by a person acceptable to the Director-General performing the quality
management function to certify that all relevant procedures have been carried out satisfactorily, prior to flight.

(f) The pilot in command of the aircraft for the particular flight, and the test pilot if appropriate shall sign the Certificate of Clearance, prior to flight, to certify that he has received and understood all of the information necessary to conduct the flight to the specified schedule.

3.9 Flight Data Recording

3.9.1 Each aircraft to be flown under 'B' Conditions shall be fitted with data and/or voice recording equipment as specified in the Air Navigation (Hong Kong) Order 1995 Schedule 5 as appropriate for the description of the aircraft. Flight testing for the issue of a Certificate of Airworthiness for series production aircraft does not require fitment of flight data recorder or voice data recorder equipment.

3.9.2 The equipment, when required by the Air Navigation (Hong Kong) Order 1995 Schedule 5, shall be operational throughout each flight conducted under 'B' Conditions. The data and/or voice recording systems may be unserviceable for any positioning flights associated with flights under 'B' Conditions.

3.9.3 In respect of each aircraft flown under 'B' Conditions and which is required to carry recording equipment, a specimen of acceptable records obtained from the equipment specified in the foregoing paragraphs 3.9.1 to 3.9.2 (inclusive) shall be preserved together with a means of identifying the flight to which the record relates. A Group F4 approval holder need only provide a specimen of the records obtained if there is any evidence that the conduct of the flight test was not satisfactory.

3.9.4 The records required by paragraph 3.9.3 above shall not be destroyed without written authorisation from the Director-General.

3.10 Aircraft Markings

3.10.1 Aircraft not registered in Hong Kong nor under the law of any state/place referred to in Article 3 of the Air Navigation
HKAR-1

(Hong Kong) Order 1995 shall be marked so as to comply with the following paragraphs 3.10.2 and 3.10.3.

3.10.2 The aircraft shall be marked with the letter B followed by three characters allocated by the Director-General. The two marks shall be separated by hyphens such that the combined marks are not those displayed currently by any other aircraft. The marks shall conform to the principles of the Air Navigation (Hong Kong) Order 1995 as to registration marks of aircraft in respect of position, size, width, spacing and colour.

NOTE: These markings are only permissible within Hong Kong airspace. Where 'B' Conditions controls are agreed by the Director-General for use outside Hong Kong airspace, the aircraft must be registered and display the appropriate registration marks.

3.10.3 The holder of the Approval granted under this Sub-section 1.8-9 shall maintain a register of the markings, which shall cross refer to the corresponding aircraft serial number allocated by the Constructor.

3.11 Maintenance of Aircraft

Any aircraft flying under 'B' Conditions shall continue to be maintained in accordance with the maintenance schedule or programme approved for the said aircraft. Any aircraft flying under 'B' Conditions for which there is no approved maintenance schedule or programme shall be maintained in an airworthy condition in accordance with a programme of maintenance prepared in accordance with appropriate procedures of the 'B' Conditions approval holder. These procedures should include provisions for any additional maintenance, which may arise from development or modifications to the aircraft while operating under 'B' Conditions.

4 REQUIREMENTS FOR MAINTAINING APPROVAL

4.1 The organisation shall be maintained at the standard necessary to undertake the work for which it is approved and the Director-General shall, at all reasonable times, have access to the organisation for the purpose of assessing the standard in use.
4.2 Any changes to the information provided to the Director-General for the grant of the approval shall first be notified to the Director-General in writing. Such changes require Director-General's approval.

4.3 Where an organisation exposition is required, this and any associated Supplements shall be maintained up to date. All amendments must be approved by the Director-General.

4.4 Changes of the persons nominated in accordance with paragraph 3.6 of this Sub-section 1.8-9 shall be notified to the Director-General in writing for acceptance.

4.5 At all reasonable times, the Director-General shall have access to all data, reports and records relating directly or indirectly to the flight testing or airworthiness of an aircraft, engine, or any part thereof. The Director-General shall also have the right to witness tests or inspections in any way associated with establishing the airworthiness or fitness for flight of an aircraft, engine, propeller, or any part thereof.

4.6 The Director-General may revoke, suspend, or vary the Schedule of Approval if the conditions required for approval are not maintained or if the organisation cannot continue to demonstrate compliance with the requirements of this Sub-section 1.8-9.

4.7 Any 'reportable occurrence', meaning an incident or accident subject to the provisions of Article 86 of the Air Navigation (Hong Kong) Order 1995, shall be reported to the Director-General in accordance with the information and guidance provided in CAD 382 'The Mandatory Occurrence Reporting Scheme'.
ORGANISATIONS - APPROVAL FOR FLIGHT UNDER 'B' CONDITIONS
GROUP F4

This Appendix contains information for guidance in complying with the requirements of Sub-section 1.8-9 for Group F4.

1 APPLICATION FOR GROUP F4 APPROVAL
(see Sub-section 1.8-9 paragraph 1.2, 3.1, 3.4, 3.6.1 and 4.1)

The F4 Approval is one of specified duration and specified scope. Due to the strictly limited nature of this approval, credit will not normally be given in respect of any subsequent application for any approval under Sub-section 1.8-9.

2 INFORMATION REQUIRED FOR F4 APPROVAL APPLICATION

The information listed in this section must be provided to support an application for F4 approval.

2.1 Compliance and Control Statement (DCA F400)

The information itemised in this section 2.1 should be provided in a single document in the order listed. (Form DCA F400 may be obtained from the CAD Airworthiness Office.)

2.1.1 General

(a) Applicant (Name, Address, Contact No., E-mail etc).

(b) Justification for the application for approval (the need for the proposed flying activity, identification of modification etc).

(c) Substantiation that there are no significant flight safety implications associated with the proposed activity.

(d) Aircraft to be tested (Aircraft Type, Serial Number, and Registration, (if any)).

(e) Intended start and end dates for the flight trials.
2.1.2 **Personnel**

(a) Name of the person in direct charge who will be accountable for compliance with the terms of the F4 approval and the safe conduct of the flight trials.

(b) Name(s) of the flight crew (Pilot(s) and Engineer(s)/Observer(s)). Note that the carriage of passengers is not permitted. A form DCA 61A for the pilot must also be provided as detailed in Sub-section 1.8-9 paragraph 3.4.

(c) Name of the person who will certify that the aircraft is fit for the intended flight. (This person may be a licensed aircraft maintenance engineer, a person approved by an approved organisation or a person nominated under paragraph 3.4.1 and accepted by the Director-General as a signatory under Sub-section 1.8-9).

(d) Name of any other signatories of certificates and/or schedules.

2.1.3 **Facilities**

(a) Maintenance facilities.

(b) Facilities for the planning of flights, and pre and post flight briefings.

(c) Administration facilities suitable for the production and storage of documents associated with 'B' Conditions activities. This should include release documentation for manufactured parts.

2.1.4 **Design Clearance**

(a) Definition of aircraft standard, as defined by Type Certificate Data Sheet or other documents, plus all subsequent modifications.
(b) Design approval of the aircraft prior to flight:

(i) Reference to the documents and/or drawings defining the modification or operation to be evaluated during the flight trials.

(ii) Where applicable, the identity of any associated organisation that holds an appropriate design approval granted by the Director-General together with their statements of compliance against the applicable airworthiness standards.

(iii) Where applicable, reference to the Airworthiness Approval Note or other documented Director-General's acceptance of the suitability of the design for the proposed flight trials.

(c) A statement of any aircraft limitations to be complied with during the flight trials, in addition to those contained in any Flight Manual or existing Permit to Fly.

2.1.5 Aircraft Maintenance

(a) Identification of the aircraft maintenance schedule in use including any special procedures or inspections to be applied to the modification being evaluated.

2.1.6 Parts Manufacture

(a) Identification of the origin of parts comprising any modifications not yet approved (e.g. CAD Form One(s) for parts comprising the modification to be assessed during the trials).

2.1.7 Quality Management

(a) The person in direct charge identified on form DCA F400 must ensure that all of the required documentation is in place and completed correctly prior to signing DCA F401.
2.2 **Flight Test Schedule**

A flight test schedule for the trials shall be provided for approval by the Director-General. The flight test schedule must specify the test objectives and, for each test point, the test conditions and manoeuvres to be flown and the measurements and observations that will be required.

2.3 **Certificate of Clearance (DCA F401)**

A Certificate of Clearance must be completed prior to each flight. (Form DCA F401 may be obtained from the CAD Airworthiness Office.)

3 **SIGNIFICANT FLIGHT SAFETY IMPLICATIONS**

Significant flight safety implications exist:

(a) With an external modification when there are perceived to be handling or performance implications or where the performance and handling of such a modification has not been seen by the Director-General before. If the Director-General has knowledge that a certain external shape does not present any handling or performance difficulties, or where the performance and handling of such a modification is similar to that of a previously approved modification, then that would not pose significant flight safety implications and could be flown under an F4 approval. Equally, some external modifications, such as measurement of the performance of aeroplanes engaged in banner towing, presents no significant flight safety risk, provided the modification itself is approved, and can therefore be conducted under an F4 approval.

(b) When an internal modification could be expected to affect other flight control systems such as FADEC, autopilot etc.

(c) For EGPWS, GPWS or TCAS modifications for which no previous STC approval has been granted, or no previous Director-General approval has been given, and which involve unusual manoeuvres to approve such a modification. Other avionic modifications, such as MMR or FMS, do not usually constitute a significant flight safety risk and can therefore often be carried out under an F4 approval.
4 FUNCTIONAL FLIGHT TESTS

A modification which has previously been approved by the Director-General will normally require no further action on behalf of the applicant. However, the modification may, in its instructions, require a functional flight test to be undertaken prior to formal acceptance of the modification. If the flight test involves a functionality check only, then it can be carried out under 'A' Conditions and does not require any 'B' Conditions approval.

Test flying of modifications not previously approved by the Director-General, will normally be undertaken using a 'B' Conditions approval.
APPROVAL FOR FLIGHT UNDER 'B' CONDITIONS – CERTIFICATE OF CLEARANCE

This Certificate is provided to support an F4 approval and is valid on the day of issue only. The Certificate of Clearance must be amended, or replaced by a new certificate, whenever a change is made to the aircraft design standard or to any document or action referenced by the Certificate.

SECTION 1 AIRCRAFT DETAILS

| (1)  | Flight number |
| (2)  | Aircraft Type |
| (3)  | Serial number |
| (4)  | Registration |
| (5)  | Airfield |
| (6)  | Aircraft Limitations. (Flight Manual or other defined documents shall be referenced plus any limitations specific to the trial or configuration). |
| (7)  | Aircraft design standard. (Identify initial build and subsequent modifications). |
| (8)  | Flight Test Schedule. (Document reference) |
### SECTION 2 CLEARANCE FOR FLIGHT

<table>
<thead>
<tr>
<th>FLIGHT NUMBER</th>
<th>CAD APPROVAL</th>
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<table>
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<tr>
<th>REFERENCE NUMBER</th>
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#### DESIGN

The defined design standard of the aircraft complies with the requirements and standards agreed with the Director-General and specified in Section 1(7) of this Form DCA F401/1.

Signed on behalf of

<table>
<thead>
<tr>
<th>Design Organisation</th>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
</table>

or

Reference of document signifying Director-General's acceptance of the design standard

<table>
<thead>
<tr>
<th>Reference of document signifying Director-General's acceptance of the design standard</th>
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</table>

#### MAINTENANCE

The necessary maintenance actions have been completed and the aircraft is airworthy.

Signed by Maintenance Engineer

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
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</table>

#### FLIGHT

The Flight Crew (and ground observers) understand and accept the test plan and limitations for the flight. A pre-flight briefing has been carried out. The aircraft is correctly loaded, (weight, centre of gravity and sufficient fuel).

Signed by the Commander of the aircraft

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<th>Name</th>
<th>Signature</th>
<th>Date</th>
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#### QUALITY

Reference of document signifying Director-General's acceptance of the flight test schedule

The flight test schedule referenced above has been accepted as appropriate for the purpose of the flight. The aircraft is in conformance with the defined design standard. All of the conditions of the approval have been complied with and this form has been completed correctly and signed by the appropriate persons.

Signed by the person in direct charge

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<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
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FORM DCA F401/2  June 2003

**Issue 2**  **1.8-9 A1 P.7**  **31 January 2009**
APPENDIX NO. 2 TO SUB-SECTION 1.8-9

ORGANISATIONS – APPROVAL FOR FLIGHT UNDER 'B' CONDITIONS
GROUP G1

This Appendix contains information for guidance in complying with the requirements of Sub-section 1.8-9 applicable to a G1 approval.

1 The following information is required to be included in the organisation Exposition:
   
   (a) Name and address of company.
   
   (b) A company organisation chart showing the lines of responsibility to the Chief Executive of the head of the flight test function and the flight test personnel.
   
   (c) General procedures for the interface with the approved design and quality management functions, for the issue of a Certificate of Clearance, including the procedures for the generation and approval of flight test programmes.
   
   (d) Particulars of facilities for the Flight Test function.
   
   (e) The names of the Certificate of Clearance flight test signatories.
   
   (f) Information as required by Sub-section 1.8-9 paragraph 3.4.
   
   (g) Category of aircraft for which the approval is to be granted.

3 CATEGORIES OF AIRCRAFT
(see Sub-section 1.8-9)

As indicated in Sub-section 1.8-9 paragraph 3, setting out the requirements for grant of approval may restrict the organisation to a limited scope or category of aircraft. An organisation may be approved for more than one category. The following categorisation will be used in the Schedule of Approval in relation to the categories of aircraft:

3.1 Category 1 Aeroplanes greater than 5,700 kg.
3.2 Category 2 Aeroplanes up to and including 5,700 kg.
3.3 Category 3 Rotorcraft greater than 5,700 kg.
3.4 Category 4  Rotorcraft, excluding Light Gyroplanes, up to and including 5,700 kg.

3.5 Category 5  Very Light Aeroplanes up to 750 kg.

3.6 Category 6  Microlight Aeroplanes and Small Light Aeroplanes up to 450kg.

3.7 Category 7  Sailplanes and Powered Sailplanes.

3.8 Category 8  Gas Airships.

3.9 Category 9  Manned Free Balloons and Hot Air Airships.

3.10 Category 10  Light Gyroplanes.

NOTE: These are broad categories which may cover a wide variety of types of aircraft. Further restrictions may be imposed within these categories.
APPENDIX NO. 3 TO SUB-SECTION 1.8-9

ORGANISATIONS - APPROVAL FOR FLIGHT UNDER 'B' CONDITIONS
GROUP F1

This Appendix contains information for guidance in complying with the requirements of Sub-section 1.8-9 applicable to an Group F1 Approval.

1 Management

The following information is required to be included in the organisation exposition:

(a) Name and address of company.

(b) A company organisation chart showing the lines of responsibility to the chief executive of:

(i) the chief test pilot and/or the head of the flight test function (see paragraph 2 below);

(ii) the design function (see paragraph 3 below);

(iii) the quality management function (see paragraph 4 below);

(iv) the airworthiness and inspection, which includes the manufacturing, installation and maintenance functions (see paragraph 5 below).

(c) Procedures detailing how the flight test function will interface with the approved design and quality management functions, for the issue of a Certificate of Clearance, including the procedures for the generation and approval of flight test schedules.

(d) The nominated signatories for the Certificate of Clearance.

(e) A copy of a Certificate of Clearance.

(f) Procedures detailing the interface arrangements of any associated organisations supporting the 'B' Conditions approval.

NOTE: The flight test schedule in (c) above must specify the test points to be examined during a specific test flight.
2  **The Flight Test Function**

The following should be included in the organisation exposition:

(a)  Particulars of facilities for the Flight Test function.

(b)  An organisation chart showing the lines of responsibility of the flight test personnel to the Head of the Flight Test function.

(c)  The names of the Certificate of Clearance flight test signatories (see also paragraph 6(n) of this Appendix).

(d)  The Flight Test Operations Manual, detailing the procedures for the control of flight tests.

3  **The Design Function**

The following information relating to the design function should be included in the organisation exposition:

(a)  Details of the design function supporting the 'B' Conditions approval.

(b)  The names of the Certificate of Clearance design signatories (see also paragraph 6(k) of this Appendix).

(c)  The procedures for the control of the modification standard, configurations and conditions to be flight tested.

4  **The Quality Management Function**

The following information relating to the quality management function should be included in the organisation exposition:

(a)  Details of the quality management function supporting the 'B' Conditions approval.

(b)  The names of the Certificate of Clearance quality management signatories (see also paragraph 6(o) of this Appendix).

5  **The Airworthiness and Inspection Function**

The following information relating to the airworthiness and inspection function, which includes manufacture, installation and maintenance, should be included in the organisation exposition:
(a) The names of the Certificate of Clearance Airworthiness and Inspection signatories (see also paragraph 6(l) and (m) of this Appendix).

(b) The procedures for the control of the build standard of the aircraft.

(c) The procedure for notifying the pilot of any changes embodied on the aircraft.

(d) The arrangements for maintaining the aircraft (see HKAR-1 Sub-section 1.8-9, sub-paragraph 3.11).

6 Certificate of Clearance

The form of the Certificate of Clearance, to be agreed with the Director-General, should normally contain at least the following information:

(a) Organisation name and approval number.

(b) Certificate number.

(c) The date of issue.

(d) Type, serial number and registration of the aircraft.

(e) A reference to documents defining the design standard of the aircraft.

(f) A reference to the approved flight test schedule(s).

(g) The maximum weight and centre-of-gravity limits.

(h) All pertinent operating limitations.

(i) The minimum crew.

(j) Any other restrictions considered necessary.

(k) A statement that the design standard and conditions stated on the certificate are adequate to conduct the necessary flight tests.

(l) A statement that the build standard of the aircraft conforms to the design standard and that the aircraft is fit for flight.

(m) A statement of compliance with maintenance requirements specified by the manufacturer and if appropriate, as modified by the design function in relation
to the work being undertaken, including hours available to the next maintenance check.

(n) A statement that the flight crew (and ground observers) understand and accept the test plan and limitations for the flight and that a pre-flight briefing has been carried out.

(o) A statement by the quality management function that all relevant procedures have been carried out satisfactorily.

7 Functional Flight Tests

An aircraft conforming to a build standard, including all modifications, which has previously been approved by the Director-General will normally require no further action on behalf of the Applicant. However, the instructions for actions to be completed prior to release to service for the aircraft, or for embodiment of an approved modification may require a functional flight test to be undertaken. If the flight test involves a functionality test only, then it can be carried out under 'A' Conditions and does not require any 'B' Conditions approval. Test flying of an aircraft of a build standard, including all modifications, not previously approved by the Director-General will normally be undertaken using a 'B' Conditions approval.

8 Categories of Aircraft

As indicated in HKAR-1 Sub-section 1.8-9 paragraph 1.4, setting out the requirements for grant of approval may restrict the organisation to a limited scope or category of aircraft. An organisation may be approved for more than one category. The following categorisation will be used in the Schedule of Approval in relation to the categories of aircraft:

Category 1: Aeroplanes greater than 5,700 kg
Category 2: Aeroplanes up to and including 5,700 kg
Category 3: Rotorcraft greater than 5,700 kg
Category 4: Rotorcraft, excluding Light Gyroplanes, up to and including 5,700 kg
Category 5: Very Light Aeroplanes up to 750 kg
Category 6: Microlight Aeroplanes and Small Light Aeroplanes up to 450 kg
Category 7: Sailplanes and Powered Sailplanes
Category 8: Gas Airships
Category 9: Manned Free Balloons and Hot Air Airships
Category 10: Light Gyroplanes

NOTE: These are broad categories which may cover a wide variety of types of aircraft. Further restrictions may be imposed within these categories.
This Appendix contains information for guidance in complying with the requirements of Sub-section 1.8-9 for Group F3.

1 Application for Group F3 Approval (see HKAR-1 Sub-section 1.8-9)

The Group F3 Approval is one of specified duration and specified scope. It is recognised that some organisations will have the need to apply for additional approval(s) within the Group F3 either after termination of the task against which the original approval was granted, or concurrently with the original task. It is not the intention of the requirements of HKAR-1 Sub-section 1.8-9 in this case to place undue burden upon organisations in the subsequent application process.

(a) When making the initial application for the grant of a Group F3, or in the event of making a new application following a revocation or suspension of a previous Group F3 Approval, the organisation must satisfy all relevant parts of HKAR-1 Sub-section 1.8-9 including the provision of an appropriate organisation exposition (or supplement to an existing organisation exposition where an approval in another Group is held).

(b) Where an organisation wishes to make a subsequent application for the grant of a Group F3 Approval and has previously held a Group F3 Approval which has expired having reached its specified duration, or holds a current Group F1 or F3 Approval with a different scope specification, then the Director-General may agree that a full organisation exposition, satisfying all relevant parts of HKAR-1 Sub-section 1.8-9, is not necessary and it will be sufficient for that organisation to include with the application a supplement to the original organisation exposition submitted and approved in connection with the original application.

(c) The organisation exposition supplement, identified in sub-paragraph 1(b) of this Appendix, need only identify the items, required by HKAR-1 Sub-section 1.8-9, which have changed from that identified in the original document and should contain a statement that all other items in the original document remain unchanged. The basic procedures, which control the flight test activity, would not be expected to change. Examples of the items that may change are the modification reference, flight test schedule, aircraft registration and serial number, flight test crew, manufacture, installation or maintenance organisations etc.
(d) Where an application is made for the grant of an additional Group F3 Approval, as defined in sub-paragraph 1(b) of this Appendix, then the Director-General's process required to investigate the application will normally consider only the changes and will be kept to a minimum. In the event that no changes have occurred, or where the changes are simple, an expeditious process resulting in the granting of the Group F3 Approval can be anticipated.

(e) Notwithstanding any other statement contained within this Appendix, where an organisation has, or has applied for, the grant of more than one Group F3 Approval, the Director-General may wish to reassess the standards in use from time to time.

(f) In connection with an application made for the grant of an additional Group F3 Approval, as defined in sub-paragraphs 1(b) and 1(d) of this Appendix, any charges due will be commensurate with the Director-General's work involved and may be less than that required for an initial application. In certain circumstances, particularly where no changes have occurred, it may be possible to include the charges for the additional Group F3 Approval within the overall charges for an associated modification.

2 Management

The following information is required to be included in the Organisation Exposition:

(a) Name and address of company.

(b) A company organisation chart showing the lines of responsibility to the chief executive of:

(i) the Chief Test Pilot and/or the head of the flight test function (see paragraph 3 below);

(ii) the design function (see paragraph 4 below);

(iii) the quality management function (see paragraph 5 below);

(iv) the airworthiness and inspection function which includes the manufacturing, installation and maintenance functions (see paragraph 6 below).
(c) Procedures detailing how the flight test function will interface with the approved design and quality management functions, for the issue of a Certificate of Clearance, including the procedures for the generation and approval of flight test schedules.

(d) The nominated signatories for the Certificate of Clearance.

(e) A copy of a Certificate of Clearance.

(f) Procedures detailing the interface arrangements of any associated organisations supporting the 'B' Conditions approval.

NOTE: The flight test schedule in paragraph (c) above must specify the test points to be examined during a specific test flight.

3 The Flight Test Function (see HKAR-1 Sub-section 1.8-9)

The following should be included in the organisation exposition or organisation exposition supplement as appropriate:

(a) Particulars of facilities for the Flight Test function.

(b) An organisation chart showing the lines of responsibility of the flight test personnel to the Head of the Flight Test function.

(c) The names of the Certificate of Clearance flight test signatories (see also paragraph 7(n) of this Appendix).

(d) The flight Test Operations Manual, detailing the procedures for the control of flight tests, must be referred to in the organisation exposition.

4 The Design Function

The following information relating to the design function should be included in the organisation exposition or organisation exposition supplement as appropriate:

(a) Details of the design function supporting the 'B' Conditions approval.

(b) The names of the Certificate of Clearance design signatories (see also sub-paragraph 7(k) of this Appendix.

(c) The procedures for the control of the modification standard, configurations and conditions to be flight tested.
The Quality Management Function

The following information relating to the quality management function should be included in the organisation exposition or organisation exposition supplement as appropriate:

(a) Details of the quality management function supporting the 'B' Conditions approval.

(b) The names of the Certificate of Clearance quality management signatories (see also sub-paragraph 7(o) of this Appendix).

The Airworthiness and Inspection Function

The following information relating to the airworthiness and inspection function, which includes manufacture, installation and maintenance, should be included in the organisation exposition or organisation exposition supplement as appropriate:

(a) The names of the Certificate of Clearance Airworthiness and Inspection signatories (see also sub-paragraphs 7(l) and 7(m) of this Appendix).

(b) The procedures for the control of the build standard of the aircraft.

(c) The procedure for notifying the pilot of any changes embodied on the aircraft.

(d) The arrangements for maintaining the aircraft.

Certificate of Clearance

The form of the Certificate of Clearance to be agreed with the Director-General should normally contain at least the following information:

(a) Organisation name and approval number.

(b) Certificate number.

(c) The date of issue.

(d) Type, serial number and registration of the aircraft.

(e) A reference to documents defining the design standard of the aircraft.

(f) A reference to the approved flight test schedule(s).
(g)  The maximum weight and centre-of-gravity limits.

(h)  All pertinent operating limitations.

(i)  The minimum crew.

(j)  Any other restrictions considered necessary.

(k)  A statement that the design standard and conditions stated on the certificate are adequate to conduct the necessary flight tests.

(l)  A statement that the build standard of the aircraft conforms to the design standard and that the aircraft is fit for flight.

(m)  A statement of compliance with maintenance requirements specified by the manufacturer and if appropriate, as modified by the design function in relation to the work being undertaken, including hours available to the next maintenance check.

(n)  A statement that the flight crew (and ground observers) understand and accept the test plan and limitations for the flight and that a pre-flight briefing has been carried out.

(o)  A statement by the quality management function that all relevant procedures have been carried out satisfactorily.

8  Functional Flight Tests

An aircraft conforming to a build standard, including all modifications, which has previously been approved by the Director-General will normally require no further action on behalf of the Applicant. However, the instructions for actions to be completed prior to release to service for the aircraft, or for embodiment of an approved modification may require a functional flight test to be undertaken. If the flight test involves a functionality test only, then it can be carried out under 'A' Conditions and does not require any 'B' Conditions approval. Test flying of an aircraft of a build standard, including all modifications, not previously approved by the Director-General will normally be undertaken using a 'B' Conditions approval.

9  Categories of Aircraft

As indicated in HKAR-1 Sub-section 1.8-9 paragraph 3, setting out the Requirements for grant of approval may restrict the organisation to a limited scope or category of aircraft. An organisation may be approved for more than one category. The
following categorisation will be used in the Schedule of Approval in relation to the categories of aircraft:

Category 1: Aeroplanes greater than 5,700 kg.
Category 2: Aeroplanes up to and including 5,700 kg.
Category 3: Rotorcraft greater than 5,700 kg.
Category 4: Rotorcraft, excluding Light Gyroplanes, up to and including 5,700 kg.
Category 5: Very Light Aeroplanes up to 750 kg.
Category 6: Microlight Aeroplanes and Small Light Aeroplanes up to 450 kg.
Category 7: Sailplanes and Powered Sailplanes.
Category 8: Gas Airships.
Category 9: Manned Free Balloons and Hot Air Airships.
Category 10: Light Gyroplanes.

NOTE: These are broad categories which may cover a wide variety of types of aircraft. Further restrictions may be imposed within these categories.
SECTION 1.8
SUB-SECTION 1.8-10
APPROVAL OF WELDERS

1 INTRODUCTION This Sub-section is applicable to persons who weld metallic parts which are essential to the airworthiness of an aircraft where the making of a sound joint by oxy-acetylene or arc-fusion welding techniques depends largely on the competency of the operator. Welders will be approved in accordance with the requirements of this Sub-section and its Appendix.

NOTE: For the purposes of this Sub-section 1.8-10, the term arc-fusion welding includes:

(a) Manual metal-arc (MMA) welding,
(b) Metal inert gas (MIG) welding, and
(c) Tungsten inert gas (TIG) welding.

2 GRANT OF APPROVAL The procedures for the issue and control of welding approval are detailed in 2.1(a) and (c). Where a welder is in the employ of an Organisation approved by the Director-General (HKAR Sub-Section 1.8 or HKAR 145) the Director-General may not undertake direct approval of the welder. The Organisation can establish its own effective system for their control. The system shall, as a minimum, include records of all sample tests (and results) and a ready means of establishing the current qualification status of all welders employed. All records shall be available to the Director-General upon request, including details relating to welders who have since left the employ of the Organisation. No essential records, e.g. Approval Cards and Test Reports shall be destroyed without the permission of the Director-General. A description of the control system shall be included in the Company Exposition required by the relevant HKAR Sub-section and the approval of the system will be indicated by inclusion of the control of welders in the Schedule of Approval.

2.1 The procedures for obtaining welder's approval are as follows:-

(a) Where the welder is employed by an Approved Organisation (holding terms of approval for control of welders), that Organisation shall make arrangements for the welder to prepare and weld an appropriate test sample(s). The Organisation shall submit the test sample(s) to an approved Test House or CAD recognised Test Laboratory (see Notes 1 and 2) for examination together with
full particulars of the welder concerned, materials used, details of any post-welding treatment (e.g. heat treatment for stress relief), and identification marks on the test sample(s). Upon receipt of an Approved Test Certificate, or equivalent, from the Test House or CAD recognised Test Laboratory, indicating successful test results for the sample(s), the organisation may grant approval to the welder. Only then may the welder be employed on work of significance to airworthiness.

NOTES:

(1) Approved Test House is under Group B4 approval which can be granted under the procedures set out in Sub-section 1.8-6.

(2) The procedures for an accredited Test Laboratory to obtain a CAD recognition are set out in Appendix 2 to this Sub-section.

(b) In the event of a welder leaving the employ of an Organisation approved by the Director-General, the welder may request the Director-General to grant a Welder's Approval Certificate for the welding approvals held while in the employ of that Organisation. It should be noted that grant of such an approval, is conditional upon the availability of evidence of prior qualification status, the Director-General cannot accept responsibility for a previous employer's failure or inability to provide the evidence.

(c) Welders may under the supervision of a responsible person acceptable to the Director-General (see Notes 3 and 4), prepare and weld appropriate test sample(s) in accordance with these requirements and also complete CAD Form DCA 408. The test sample(s) shall be submitted to an approved Test House or CAD recognised Test Laboratory for examination together with full particulars of the welder concerned, materials used, details of any post-welding treatment (e.g. heat treatment for stress relief) and identification marks on the test sample(s). Upon receiving from the Test House or CAD recognised Test Laboratory, an Approved Test Certificate indicating successful test results on the sample(s) the welder shall forward the original copy of the Approved Test Certificate and the completed CAD Form DCA 408 to the Director-General. Grant of approval will be notified by issue of a CAD Welder's Approval Certificate and Check Test Record Card to the welder. Both documents must be maintained in a legible condition by the welder and produced or surrendered to the Director-General upon request. Test House or CAD recognised Test Laboratory charges and any other costs associated with the
process of meeting these requirements are the responsibility of the welder.

NOTES: (3) An approved welder is not permitted to certify welded parts unless separately qualified as a person competent to issue a Certificate of Release to Service, e.g. holder of an appropriate Maintenance Engineer's Licence or equivalent approval.

(4) A responsible person in the context of paragraph 2.1(c) is either:

(a) A person who holds an Aircraft Maintenance Licence with a Type Rating.

or

(b) A person who is currently authorised as a Signatory within an Approved Organisation. (The consent of the Approved Organisation responsible for granting such authorisation should be obtained by the Signatory before agreeing to supervise the preparation of weld test sample.)

or

(c) Such other person specifically authorised in writing by the Director-General.

(5) Paragraph 2.1(a) and 2.1(c) refer to identification marks on test samples. These shall be made permanent i.e. stamp, vibro-etch, or indelible marking medium and they shall identify the welder and material specification. When preparing and welding the sample, care should be taken not to obliterate any markings thereon.

3 MAINTENANCE OF APPROVAL

3.1 The validity of a welder's approval may be maintained by the procedures detailed in paragraphs 3.1.1 or 3.1.2 as appropriate. Should approval be sought in a different combination (see Appendix No. 1) than that shown on the Welder's Approval Certificate or documents, the procedure for the grant of approval as prescribed in paragraph 2.1 must be followed.

3.1.1 Where the welder is employed by an Organisation approved by the Director-General, the approved Organisation shall arrange for periodic check examinations of the welder's competency. At each periodic check examination an appropriate standard test sample (see Appendix No. 1) or such other test samples to be decided by the approved Organisation shall be completed by the welder using techniques and materials detailed in the Appendix, or by using techniques and material used in standard work practices appropriate to the maintenance of approval. For welders holding approval for more than one configuration (i.e. sheet to sheet, sheet to tube or
tube to tube) it will normally only be necessary to provide a single test sample provided that the Director-General is satisfied it is representative of the welder's main day-to-day work. However, a separate initial test sample will be required for each technique and material group specified in the welder's approval. Test samples shall be sent to an approved Test House or CAD recognised Test Laboratory under arrangements made by the approved Organisation. If the test results of this examination are satisfactory the Welder's Approval document shall be endorsed by the approved Organisation. Complete records of the periodical check examinations shall be kept at the Organisation. The check test records for each welder must indicate the date for the next check test in advance so that the test can be completed and the results known within the period of approval of the welder. All records shall be held available to the Director-General.

(a) The maximum period between check examinations shall be 12 months. Organisations shall arrange for the relevant test within the period of validity of the previous test period to ensure continuity of approval.

(b) If the test results are unsatisfactory the approved Organisation shall arrange for the check examinations to be repeated immediately and the samples sent to an approved Test House or CAD recognised Test Laboratory for examination. During the period between any check test which proved unsatisfactory and the result of the next check test, the welder shall not weld parts which are essential to the airworthiness of an aircraft. If the test results are again unsatisfactory the welder's approval shall be suspended until further training and/or experience has been gained to the satisfaction of the approved Organisation, and a further test has been satisfactorily completed.

3.1.2 Welders who are not approved in accordance with the procedures of paragraph 3.1.1. shall arrange for a check examination to be carried out at periods not exceeding 12 months. The same procedure as for the issue of the Welder's Approval Certificate in paragraph 2.1 (c) shall apply except that, for welders holding approval for more than one configuration (i.e. sheet to sheet, sheet to tube, tube to tube) it will normally only be necessary to provide a single test sample, provided that the Director-General is satisfied it is representative of the welder's main day-to-day work. However, a
separate initial test sample will be required for each technique and material group specified in the welder's approval.

(a) If the test results are unsatisfactory the applicant shall prepare new test samples and arrange for the check examination to be repeated immediately at an approved Test House or CAD recognised Test Laboratory. During the period between any check test which proves unsatisfactory and the result of the next check test, the welder shall not weld parts which are essential to the airworthiness of an aircraft. If the result of the re-test is again unsatisfactory, the welder shall notify the Director-General. The approval will be suspended from the date of the first unsatisfactory examination and remain so until further training and/or experience has been gained and a further test has been satisfactory completed.

(b) A check test record must be kept to indicate the date for the next check test in advance so that the test can be completed and the results known within the period of approval of the welder. All records shall be made available to the Director-General.

3.2 The Director-General may select samples of an approved welder's work at any time for additional check examination purposes.
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APPENDIX NO. 1 TO SUB-SECTION 1.8-10

APPROVAL OF WELDERS

1 INTRODUCTION Welders shall be approved in accordance with the technical requirements of this Appendix to Sub-section 1.8-10.

2 MATERIAL GROUPS Approval may be granted in any of the following groups:-

- Group 1 - Aluminium Alloys.
- Group 2 - Magnesium Alloys
- Group 3 - Carbon Steels.
- Group 4 - Corrosion and Heat-Resisting Steels
- Group 5 - Nickel Alloys.
- Group 6 - Copper Base Alloys.
- Group 7 - Titanium Alloys.

2.1 For the purpose of this Appendix to Sub-section 1.8-10 the following Definitions shall apply:-

- Combination - Material group, configuration and technique.
- Configuration - A sample produced to Figures 1, 2 or 3.
- Technique - The welding method e.g. oxy-acetylene or arc-fusion.
- Test Sample (Standard) - As detailed in Figures 1, 2 and 3.
- Test Sample (Special) - As dictated by the nature of work being undertaken (e.g. repair or rebuild fan blades etc).

2.2 Approval, when granted to the welder, shall be restricted to the combinations for which satisfactory examination reports from an approved Test House are available to the Director or the Approved Organisation, in accordance with the procedure under which the welder is to be approved, HKAR Sub-section 1.8-10 paragraph 2 refers.

Alternatively, special test samples, agreed by the Director or the Approved Organisation, should be prepared if required for a specific application, and the approval, when granted, will be restricted accordingly.

3 TEST SAMPLES AND SPECIMENS Standard test samples for oxy-acetylene and arc-fusion welding shall be prepared by the welder using the techniques and materials appropriate to the approval sought. The specifications
of the material used for test samples must meet the requirements of the material groups defined in paragraph 2 and be representative of materials likely to be encountered by the welder in the course of his normal work. The approved certificates are not necessary and material of good commercial quality may be appropriate. However, if the material used is not to a British Standard or other generally recognised aerospace specification a typical aircraft application must be quoted to the approved Test House as part of the material specification. The Director or the Approved Organisation may decide that special test samples are required appropriate to the work to be undertaken by the welder. The preparation of test samples shall be supervised as defined in Sub-section 1.8-10 paragraph 3.1.

3.1 **Standard Test Samples.** The standard test samples for oxy-acetylene and arc-fusion welding shall be prepared to Figures 1, 2 and 3 as appropriate.

3.1.1 The welds of test samples shall not be hammered or dressed unless specifically required.

3.1.2 The test samples shall be submitted complete and suitably identified (see Sub-section 1.8-10 paragraph 2.1 Note (4)) to an approved Test House.

3.1.3 Where appropriate, e.g. for light aircraft structural applications, tube wall thickness may be reduced. In certain cases, where the nature of a welder's activities regularly involve welding thin wall tube, the controlling organisation or authority may require test specimens to be prepared from material of reduced wall thickness.

3.2 **Cutting Test Specimens.** Test specimens shall be cut by the approved Test House.

3.2.1 Test specimens from standard test samples shall be cut in accordance with the tensile, bend and micro specimens shown in Figures 1, 2 and 3.

3.2.2 Test specimens in magnesium must be sawn from samples and filed to final shape to prevent the possibility of cracking.

4 **MECHANICAL TESTING**

4.1 **Tensile Test Specimen** Tensile test specimens shall be tested to destruction in direct tension. The minimum acceptable tensile strength of the weld test specimen shall be determined by reference to public-domain
DEF STAN 00-932 or by reference to a recognised Design Authority who can judge the acceptable levels of weld strength required for typical applications of the weld technique in question.

4.1.1 **Sheet to Sheet Butt Weld (Figure 1).** If a tensile specimen prepared in accordance with Figure 1 should break through the weld, it is considered satisfactory only if the ultimate stress is found to be equal to, or greater than, the minimum value given in the appropriate specification.

4.1.2 **Tube to Tube Weld.** Tensile specimens prepared in accordance with Figure 3 shall be broken in a tensile test machine fitted with suitable shackles and pins, the pins being passed through the top and bottom cross tubes of the specimen so that the end load may be applied without bending.

4.2 **Bend Test Specimens (Figure 1).** Bend specimens shall be tested in bending so that the weld lies along the centre line of the bend and the base of the weld ‘V’ is on the inner side of the specimen after bending. The specimen must bend without cracking, through 180° (unless otherwise stated) over the radius of bend appropriate to the test.

4.2.1 To ensure close contract of the specimen to the bar about which it is bent, the side of the specimen remote from the weld face must be dressed by filing or grinding until the weld is level with the parent metal. In may also be necessary to dress the other face to facilitate bending. The edges of the specimen in the vicinity of the weld must be given reasonable radii.

4.2.2 Bend test specimens of austenitic steel must be given the 'weld decay' pickling test prescribed either in the relevant specification or in accordance with British Standard 5903, and must be bent through 90° over a radius equal to three times the nominal thickness of the parent metal.

4.2.3 Magnesium alloy specimens must be bent through 180° over a radius equal to ten times the nominal thickness of the parent metal.

4.2.4 Aluminum alloy specimens must be bent through 180° over a radius equal to five times the nominal thickness of the parent metal.

4.2.5 Boron-containing steels must be bent through 180° over a radius equal to three times the nominal thickness of the parent metal.
4.2.6 Titanium alloy specimens must be bent through 180° over a radius equal to five times the nominal thickness of the parent metal.

4.2.7 Specimens of all other materials must be bent through 180° over a radius equal to twice the nominal thickness of the parent metal.

4.2.8 The bend tests may be considered satisfactory if the test specimen withstands the bending without showing cracks which are apparent to normal vision.

NOTE: If interpretation of the bend test results is in doubt, comparison may be made with the bend test performance of a separate sample of the parent material from which the test specimens were fabricated.

5 SPECIMEN EXAMINATION

5.1 Final assessment of the weld shall be based on consideration of the sample weld as a whole, including the results obtained by visual, microscopical, and where applicable, mechanical testing. If any doubt exists regarding the quality of the weld, or any defect revealed is thought to be of a local character, further sections may, if available, be examined and final assessment shall be based on all the specimens examined.

5.2 The micro specimen shall be examined at suitable magnifications in the unetched and the etched condition.

5.3 The presence of intergranular oxide films is considered to be detrimental to the weld due to their embrittling effect, but the extent of these films is very difficult to determine in etched specimens. If the area of intergranular oxide is only very slight and satisfactory results and obtained by mechanical testing, further sections of the weld shall be examined before a decision is reached.

5.4 Where fillet welds are concerned, unless complete fusion is required by the drawing, a certain degree of lack of fusion is permissible at the roots:–

(a) For fillet welds of 45° or more, the maximum lack of fusion which can normally be accepted is that revealed by a line of oxide extending from the root of the weld for a distance not greater than one-third of that between the root and the toes of the weld. Provided the amount of weld material used has been adequate, this method of assessment should ensure that the effective throat thickness of the weld is not less than the thickness of the sheets or tubes used for the specimens.
(b) For fillet welds at acute angles, full root fusion in tubular sections can be difficult to achieve and there is a danger of collapse of the tube walls if excessive penetration is attempted. The presence of a fairly large cavity, or corresponding lack of fusion, is permissible at the root of such welds but there should be a bridge of weld metal of a reasonable throat depth, showing satisfactory fusion to the basic metal.

5.5. **Sheet to Sheet Butt Welds.** The section must be free from excess oxidation, burning, cracks, cavitation, porosity, scale and slag. The specimen must show adequate penetration and with specimens welded from one side only, there should be evidence of adequate penetration when the underside of the weld is examined. If excessive penetration has occurred along the majority of the weld the specimen must be rejected, but isolated excrescences on the underside are permissible, provided the weld itself is free from cavities, oxide films, and other defects.

5.6 **Tube to Sheet and Tube to Tube Welds.** The specimens must show adequate penetration and freedom from excess oxidation cracks, cavitation, porosity, scale and slag.

5.7 **Records.** The results of all examinations must be recorded.
Figure 1  SHEET TO SHEET BUTT WELD

Note: Dimensions may be regarded as approximate.

Figure 2  SHEET TO TUBE WELD

Note: If desired, an end plate may be welded to each end of the test specimen to provide additional material for use in assessing borderline cases (see 5.1).
Note: If desired, small air vent holes may be drilled in the 2.6 mm (12 swg) tubes in the tensile specimen and the 2 mm (14 swg) tube in the micro specimen.

Figure 3  TUBE TO TUBE WELD
APPENDIX NO. 2 TO SUB-SECTION 1.8-10

RECOGNITION OF TEST LABORATORY HOLDING CNAS / HKAS / UKAS ACCREDITATION

This Appendix contains information for guidance in complying with the requirements of Sub-section 1.8-10 for Recognised Test Laboratories.

1 Introduction

The Director-General is satisfied that the accreditation standards established by either China National Accreditation Service for Conformity Assessment (CNAS) or Hong Kong Accreditation Service (HKAS) or United Kingdom Accreditation Service (UKAS) are equivalent to the standards required by HKAR-1 Sub-section 1.8-6. The Director-General will, therefore, recognise a CNAS, HKAS or UKAS accredited test laboratory via the maintenance procedures and quality system as specified in the HKAR-145, especially AMC 145.65(b)(2) and AMC 145.65(c)(1) subject to the conditions shown in paragraph 3 below.

2 Application

2.1 Application for such CAD recognition shall be made by a HKAR-145 Approved Maintenance Organisation (AMO) which employs welders. The AMO should make an application to the Director-General including the following information:

Accredited Test Laboratory
- Registered name,
- Address,
- Telephone/fax number,
- Name of the Chief Executive Officer, or equivalent,
- A copy of the relevant Accreditation Schedule, and
- A signed statement per paragraph 2.3 below.

Maintenance Organisation Exposition (MOE) Revision
- Maintenance procedures for the control of the accredited laboratory’s welding specimen test per AMC 145.65(b)(2).
HKAR-1

- Pre-audit procedures and a periodic audit plan under the quality system of the AMO per AMC 145.65(c)(1).

2.2 Once the Director-General is satisfied with the pre-audit procedures, the AMO should conduct the audit and submit subsequently the audit report for a final assessment.

2.3 A statement signed by the Chief Executive Officer, or equivalent, of the laboratory to the effect that the management of the laboratory will be conducted with due regard to the needs of airworthiness, and grant access to the customer’s quality audit staff (QA) who will perform surveillance and audit in respect of the quality system of the AMO.

3 Conditions

3.1 The laboratory’s "Control Manual", required under the corresponding accreditation, shall be maintained up to date and be made available for assessment by the Director-General or the AMO as necessary.

3.2 The CAD recognition of a particular laboratory is based on the corresponding accreditation (CNAS/HKAS/UKAS) and will become invalid if the accreditation ceases.

4 Requirements for the AMO to Maintain Such Recognition

4.1 The AMO should demonstrate continued oversight on the Recognised Test Laboratory by its quality system, such as, but not limited to periodic audits. The audits can be performed, if possible, in conjunction with the accreditation body reassessment or surveillance visits, and may include witness tests by the QA as necessary.

4.2 Prior to sending welding specimens to the Recognised Test Laboratory, the AMO shall ensure that the schedule of accreditation, in particular for the welding specimen test, is still valid.

4.3 The AMO shall consult the Director-General if in any difficulty about the interpretation of the requirements or associated procedures.

4.4 The Director-General may withdraw the recognition if, in his opinion, the conditions required for recognition are not met.

27 February 2015

1.8-10 A2 P.2
5 General

The implementation of the CAD recognition of CNAS, HKAS or UKAS accredited laboratories per this Appendix has no effect to the approval status of existing organisations holding a B4 Test House approval for welding specimen test. Having said that, the aforesaid organisations may apply for recognition under provisions of this Appendix.
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SECTION 1.8
SUB-SECTION 1.8-11

PROCEDURES FOR APPROVAL OF ORGANISATION CONCERNED WITH RADIOGRAPHIC INSPECTION OF AIRCRAFT DURING MAINTENANCE AND OVERHAUL

1 INTRODUCTION

Organisations engaged in radiographic inspection of aircraft during overhauls, repairs, replacements, modifications and inspections may be approved to provide reports and certify compliance in respect of this work on aircraft structures, structural components, and welded structural components, subject to compliance with the procedures set down in this Sub-section 1.8-11 and the Appendix.

NOTES: (1) No separate approval is necessary in respect of organisations which have been approved by JAA according to JAR-145. The JAR-145 is recognised by the Director-General as an acceptable basis for showing compliance with the Hong Kong airworthiness codes. The JAA Approvals constitute the basis for the issue of approvals required by the Air Navigation (Hong Kong) Order 1995.

(2) Safety and protection procedures are not included in this Sub-section and Appendix. It is incumbent on the operator to comply with the relevant Regulations.

2 APPLICATION

Organisations seeking approval, or the extension of an existing approval, for the radiographic work described in paragraph 1, shall make written application to the Director-General.

3 REQUIREMENTS FOR GRANT OF APPROVAL

3.1 The radiographic department shall be organised under the direction of a radiographer who has satisfied the appropriate requirements of the Appendix No. 1 of this Sub-section.

3.2 All radiographic inspections shall be directly supervised and the final certification made by a radiographer who has satisfied the appropriate requirements of the Appendix. Certification shall be in a form agreed by the Director-General.
3.3 Radiographic inspections concerned with the inspections required in approved Manuals, approved Maintenance Schedules and the mandatory modifications and inspections prescribed by the Director-General in Hong Kong Airworthiness Notice No. 36, shall be made in accordance with techniques approved by the manufacturer, or an appropriately approved Organisation unless an alternative technique has been accepted by the Director-General.
APPENDIX NO. 1 TO SUB-SECTION 1.8-11

PROCEDURES FOR APPROVAL OF ORGANISATIONS
CONCERNED WITH RADIOGRAPHIC INSPECTION
OF AIRCRAFT DURING MAINTENANCE AND OVERHAUL

1 REQUIREMENTS FOR THE RADIOGRAPHER

1.1 The following shall be satisfied by the person(s) required under paragraph 3.1 and 3.2 of Sub-section 1.8-11:-

1.1.1 For aircraft structures and structural components (other than welds):-

(a) Be able to read, write and converse in the English language.

(b) Have experience, acceptable to the Director, of a minimum of one year dealing with practical inspection of aircraft structures, or alternative training or experience acceptable to the Director.

(c) Have satisfactorily completed a course of instruction in radiography acceptable to the Director.

(d) Produce evidence, satisfactory to the Director, of at least six months' recent work in radiographic inspection of aircraft structures and structural components, including processing and interpretation of radiographs.

(e) Have achieved a satisfactory standard, acceptable to the Director, in the appropriate parts of the examination in accordance with paragraph 2 of this Appendix.

1.1.2 For light alloy and dense metal welded structural components:-

(a) Be able to read, write and converse in the English language.

(b) Have satisfactorily completed a course of instruction in radiography acceptable to the Director.

(c) Produce evidence, satisfactory to the Director, of at least three months' recent work in the radiographic inspection of
both (or either if required separately) light alloy and dense metal welded aircraft structural components.

(d) Have achieved a satisfactory standard, acceptable to the Director, in the examination detailed in paragraph 2 of this Appendix.

2 EXAMINATION SYLLABUS

2.1 Written Examination. The written examination will include questions on the following:-

(a) The elementary principles of radiographic theory and how these principles are related to the practical techniques of radiography.

(b) The photographic aspects of radiography.

(c) Safety and protection against radiation hazards.

2.2 Practical Test. The practical test will consist of the following:-

(a) The development and recording of techniques for the inspection of typical aircraft structures including structural components.

(b) The development and recording of techniques for the inspection of welded structural components.

(c) The practical application of the techniques.

(d) Processing the radiographs.

2.3 Interpretation Test. The interpretation test will consist of the following:-

(a) The co-relation of the radiographs with the report.

(b) Identification of the various features in the radiographs.

2.4 Appropriate Parts of the Examination. The following parts are appropriate to the approval sought:-

(a) The written examination (paragraph 2.1) shall be undertaken by all radiographers.

31 January 2009 1.8-11 A1 P.2 Issue2
(b) Practical Test. Paragraph 2.2(a), (c) and (d) are applicable where approval is sought for inspection of aircraft structures and structural components. Paragraph 2.2 (b), (c) and (d) are applicable where approval is sought for inspection of welded structural components.

(c) An interpretation test (paragraph 2.3) shall be undertaken by all radiographers.

3 RE-EXAMINATION The Director may require re-examination of a radiographer at times which will be notified in writing to the approved Organisation.
SECTION 1.8
SUB-SECTION 1.8-12

PROCEDURES FOR APPROVAL OF ORGANISATIONS CONCERNED WITH ULTRASONIC INSPECTION OF AIRCRAFT DURING MAINTENANCE AND OVERHAUL

1 INTRODUCTION

Organisations engaged in ultrasonic inspection of aircraft during overhauls, repairs, replacements, modifications and inspections may be approved to provide reports and certify compliance in respect of this work, subject to compliance with the procedures set down in this Sub-section 1.8-12 and the Appendix.

NOTE: No separate approval is necessary in respect of organisations which have been approved by JAA according to JAR-145. The JAR-145 is recognised by the Director-General as an acceptable basis for showing compliance with the Hong Kong airworthiness codes. The JAA Approvals constitute the basis for the issue of approvals required by the Air Navigation (Hong Kong) Order 1995.

2 APPLICATION

Organisations seeking approval, or the extension of an existing approval, for the ultrasonic work described in paragraph 1, shall make written application to the Director-General.

3 REQUIREMENTS FOR GRANT OF APPROVAL

3.1 The Ultrasonic Inspection Department shall be organised under the direction of a person who has satisfied the requirements of the Appendix to this Sub-section.

3.2 All ultrasonic inspections shall be directly supervised, and the final certification made by a person who has satisfied the requirements of the Appendix to this Sub-section. Certification shall be in a form agreed by the Director-General.

3.3 Ultrasonic inspections concerned with the inspections required in approved Manuals, approved Maintenance Schedules, and the mandatory modifications and inspections prescribed by the Director-General in Hong Kong Airworthiness Notice No. 36, shall be made in accordance with
techniques approved by the manufacturer, or an appropriately approved Organisation unless an alternative technique has been accepted by the Director-General.
APPENDIX NO. 1 TO SUB-SECTION 1.8-12

PROCEDURES FOR APPROVAL OF ORGANISATIONS
CONCERNED WITH ULTRASONIC INSPECTION
OF AIRCRAFT DURING MAINTENANCE AND OVERHAUL

1 REQUIREMENTS FOR THE ULTRASONIC TECHNICIAN

1.1. The following shall be satisfied by the person(s) required under paragraph 3.1 and 3.2 of Sub-section 1.8-12:-

(a) Be able to read, write and converse in the English language.

(b) Have experience, acceptable to the Director, of a minimum of one year dealing with practical inspection aircraft, or alternative training or experience acceptable to the Director.

(c) Have satisfactorily completed a course of instruction in ultrasonic flaw detection acceptable to the Director.

(d) Produce evidence, satisfactory to the Director, of at least six months' recent work in ultrasonic inspection of aircraft.

(e) Have achieved a satisfactory standard, acceptable to the Director, in the examination detailed in paragraph 2 of this Appendix.

2 EXAMINATION SYLLABUS

2.1 Written Examination. The written examination will include questions on the following:-

(a) Modes of ultrasonic propagation in solids and liquids.

(b) Reflection, refraction, absorption and scattering of ultrasonic waves.

(c) Piezo-electric crystals: basic essentials of the construction and mode of operation of ultrasonic probes.

(d) Methods of coupling ultrasonic probes to the workpiece.
(e) Functions of the externally accessible controls normally fitted to ultrasonic flaw detection equipment.

(f) Scope and limitations of ultrasonic flaw detection.

(g) Application of the reflection and transmission method of testing aluminium alloy and steel workpieces, including welds.

(h) The use of standard reference blocks for checking sensitivity of equipment and estimation of defect size and depth.

(j) The recognition of defect indications and the interpretation of these.

(k) Definition of the term 'decibel' as applied to a unit of voltage (or amplitude) difference: the use of attenuators.

(l) Recognition of false indications.

NOTE: The approach to the above subjects should be practical rather than mathematical.

2.2 Practical Test. Ultrasonic flaw detection shall be carried out on a given number of specimens using contact scan techniques. The test on one specimen will include the estimation of defect size by means of standard reference blocks (flat bottom hole type) and suitable attenuators.

2.3 Technical Preparations. Ultrasonic flaw detection contact scan techniques, shall be prepared in respect of a number of specimens as follows:-

(a) Comprehensive inspection of one specimen.

(b) Inspection for a particular defect in the remaining specimens including the design of suitable test pieces.

3 RE-EXAMINATION The Director may require re-examination of an ultrasonic technician at times which will be notified in writing to the approved Organisation.

31 January 2009 1.8-12 A1 P.2 Issue 2
SECTION 1.8

SUB-SECTION 1.8-13

AIRCRAFT AND AIRCRAFT COMPONENT MAINTENANCE ORGANISATION

1 INTRODUCTION

1.1 Pursuant to Articles 9 and 11 of the Air Navigation (Hong Kong) Order 1995 (AN(HK)O), an organisation may, subject to compliance with the requirements set out in HKAR-145, be approved to certify that the maintenance of specific aircraft/aircraft component has been carried out in conformity with acceptable standards/specifications and Hong Kong aviation requirements.

2 APPLICATION

2.1 Application for an HKAR-145 maintenance organisation approval shall be made on CAD Form Two (Form DCA 190), copies of which may be obtained from the CAD Airworthiness Office. The form when completed by the accountable manager should be returned to the same address with a copy of the Maintenance Organisation Exposition.

NOTE: The Maintenance Organisation Exposition should contain the information, as applicable, specified in the Appendix 2 to HKAR-145.

3 GRANT OF APPROVAL

(See Appendices No. 1 and No. 2 to Sub-section 1.8-13)

3.1 The HKAR-145 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.

3.2 The approval, when granted, will apply to the whole organisation headed by the accountable manager.

3.3 An applicant who meets the requirements of the HKAR-145 and has paid the charges prescribed in the Hong Kong Air Navigation (Fees) Regulation is entitled to a maintenance organisation approval.
3.4 The grant of approval is indicated by the issue of an approval certificate to the organisation by the Director-General. The approval certificate will specify the extent of approval. The HKAR-145 approved maintenance organisation's exposition must specify the scope of work deemed to constitute approval.

4 AUTHORISATION

4.1 Authorisations to sign Certificate of Maintenance Review, Certificates of Release to Service and Certificate of Fitness for Flight should comply with Appendix No.3 to Sub-section 1.8-13, unless otherwise specified in HKAR-145.
APPENDIX NO. 1 TO SUB-SECTION 1.8-13

ASSESSMENT OF SUITABILITY FOR APPROVAL

1 CONSIDERATIONS

(See Sub-section 1.8-13 paragraph 3)

The assessment of suitability for Approval of an aircraft and/or aircraft component maintenance organisation is in accordance with the HKAR-145 requirements.
APPENDIX NO. 2 TO SUB-SECTION 1.8-13

TRAINING PROGRAMME AND FACILITIES

1  GENERAL

1.1  Training of personnel is considered by the Director-General as an integral part of the HKAR 145 Approval. Separate organisations may be accepted by the Director-General to carry out specific training programmes, where an agreement exists between the HKAR-145 Organisation and the Training Organisation.

NOTE: HKAR-147, the requirements for Approval of Maintenance Training Organisations, became effective on 1 January 2001. These cover the requirements for Type Training to support HKAR-66 Maintenance Certifying Staff requirements and organisation approval to HKAR-145. HKAR-147 Approvals will also be used to replace those approvals and training recognition issued under HKAR-AMEL. A HKAR-145 Approved Organisation will be required to hold a HKAR-147 Type Training Approval by 1 January 2003 where it wishes to conduct training in association with the certification authorisation to staff after that date.

1.2  Where all or part of the training programme is sub-contracted to an outside organisation which is not itself approved for the training, it is the responsibility of the organisation approved for maintenance to ensure that the standard of training is acceptable to the Director-General and continues to be so.

1.2.1  The liaison procedure between the Training Organisation and the Approved Organisation in respect of examination standards shall be to the satisfaction of the Director-General.

2  ORGANISATION AND EQUIPMENT

2.1  The experience and qualifications of the person in charge of the training and his deputy shall be such as to ensure that the training will be conducted in a satisfactory manner.

2.2  Staff numbers, qualifications and experience shall be appropriate to the intended training programmes. Practical maintenance training shall be supervised by experienced aircraft maintenance engineers, and shall be recorded. A staff training policy shall be agreed with the Director-General.
2.3 Suitable accommodation shall be provided for the administrative and training staff.

2.4 The number of lecture rooms and demonstration areas shall be satisfactory when considered in relation to the intended training programmes. Heating, lighting, ventilation and noise insulation shall be to acceptable standards.

2.4.1 Classroom accommodation shall be equipped with all necessary teaching aids, including at least wall boards for text/drawing, flip charts and projection equipment for presenting prepared figures, diagrams and text. Such equipment should be of a standard that ensures students can easily read presentation text/drawings/diagrams and figures from any position in the classroom.

2.4.2 Storage accommodation shall be provided for equipment not in use.

2.5 Appropriate teaching, demonstration and projection facilities shall be available and shall be maintained to a satisfactory standard.

2.6 Appropriate library facilities shall be provided for the use of training staff and trainees. The facilities shall include relevant aircraft/aerospace components maintenance manuals, official publications, and such basic educational books as may be required.

2.6.1 Suitable arrangements shall be made to ensure that technical publications contained in the library are up to date and reflect current amendment standards.

2.6.2 Where the Training Organisation is accepted by the Director-General, any significant changes of personnel, organisation, or training syllabi shall be agreed with the Director-General.

2.6.3 In order to satisfy himself that the standard of Approved training is being maintained at a satisfactory level, the Director-General shall have reasonable access to the organisation and its records. Periodic visits will be made and examination standards will be checked.
3 TRAINING AND TRAINING PROGRAMMES

The provisions of this paragraph 3 are applicable to training approved in accordance with paragraph 1.1. They should also be taken into account where training is sub-contracted as in paragraph 1.2.

3.1 Training shall normally consist of theoretical and practical periods to syllabi and programmes acceptable to the Director-General.

3.2 The training programme shall, in addition to providing for training on the relevant aircraft/aircraft components and systems, provide for training in any necessary special techniques required and in the procedures and practices of the Approved Organisation.

3.3 Training programmes and their administration shall comply with the following:-

(a) Suitable standards for course entry and final performance shall be specified by the Training Organisation in respect of each syllabus.

(b) Lecture notes, diagrams and any other instructional material shall be substantially accurate at the time they are handed out. Where an amendment service is not to be provided a written warning must be given to this effect.

(c) Examinations shall be held at the conclusion of each distinct phase or section of the training. A final examination shall be held covering the complete syllabus.

(d) The content, type, and acceptance standard of examination shall be agreed with the Director-General.

(e) Examination questions in use shall be sufficient to give full coverage of the phase or section of the syllabus, and shall be appropriate to the expected final performance of the trainee.

(f) The questions set in particular examinations shall be controlled by supervisory staff, and not by staff directly concerned with the instruction.

(g) A regular programme of examination question analysis and revision shall be arranged under the direct supervision of a senior member of the training staff.
(h) Examination papers and records shall be the responsibility of the Approved Organisation, and shall be stored in locked cabinets.

(j) Records shall not be destroyed or dispersed without the written agreement of the Director-General.
APPENDIX NO. 3 TO SUB-SECTION 1.8-13

AUTHORISATION OF PERSONNEL

<table>
<thead>
<tr>
<th>1</th>
<th>PERSONS AUTHORISED TO ISSUE CERTIFICATE OF MAINTENANCE REVIEW</th>
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<tr>
<td>1.1</td>
<td>Authorisations to issue Certificate of Maintenance Review (CMR) shall be granted only to persons who comply with subparagraphs 1.1.1 to 1.1.5.</td>
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1.1.1 Have an appropriate HKAR-66 category B1, B2 or C licence in the subcategory of the aircraft reviewed.

- Note 1: Subcategories of B1 mean B1.1 Aeroplanes Turbine, B1.2 Aeroplanes Piston, B1.3 Helicopters Turbine and B1.4 Helicopters Piston. For B2 and C licences where there are no subcategories, the holder should also have endorsed a type rating on an aircraft in the same group i.e. aeroplane piston engines, aeroplane turbine engines, helicopter piston engines or helicopter turbine engines.

- Note 2: If the CMR signatory has obtained an aircraft type-rated HKAR-66 subcategory B1.1 or B1.3 or category B2 licence and exercised the privileges of issuing CMR, then he/she is also qualified to issue CMR for other aircraft types in the same subcategory B1.1 or B1.3 or category B2 licence, provided they have completed respective aircraft type training of at least Level I of ATA specification 104.

HKAR-145 does not require a category C certifying staff for the certification of simple light aeroplanes as category B3 or subcategory B1.2 or B1.4 covers all maintenance.

- Note 3: In the case of a B1 / B2 licence with limitations, the licence must be at least dual trade as per HKAR-66. For example, a B1 licence with a limitation on electrical power but includes airframes and engines privileges is acceptable. A B1 licence that only includes engines but has no privileges on airframe and electrical power is not acceptable.

1.1.2 Have at least five years experience in continuing airworthiness. The experience gained should include a broad range of appropriate continuing airworthiness related activities e.g. review of the accomplishment of: pre-flight inspections, rectification or deferral of defects in accordance with Minimum Equipment List / Configuration Deviation List, maintenance tasks per approved maintenance schedule, Airworthiness Directives, modifications, repairs and flight tests when necessary; and also analysis of the effectiveness of approved maintenance schedule etc.
Quality Department staff may gain experience through carrying out relevant audits and product samples.

Note: "Continuing airworthiness" means all of the processes ensuring that, at any time in its operating life, the aircraft complies with the airworthiness requirements in force and is in a condition for safe operation.

1.1.3 Hold a position within an approved organisation independent from the airworthiness management process or with overall responsibility for the airworthiness management process of complete aircraft. The following personnels are acceptable.

(a) Accountable Manager or the Nominated post holder for continuing airworthiness.

(b) A person independent of the continuing airworthiness management process for the aircraft under review, such as Technical Services department staff who have airworthiness review responsibilities for a different fleet of aeroplanes or helicopters compared to the type(s) for which they are normally involved.

(c) The person having the overall management responsibility for the department that undertakes the continuing airworthiness management tasks, of which details can be referred to HKAR-1 Sub-section 1.6-2 paragraph 4.2.

(d) Quality Department staff may be eligible provided they do not carry out audits on any airworthiness review process that they have been involved in, and neither perform an aircraft survey nor carry out a product audit on that aircraft within the last 28 days before the date of the review.

(e) Maintenance personnel of a HKAR-145 approved maintenance organisations may be nominated as airworthiness review staff as long as they are not involved in the airworthiness management of the aircraft. These personnel should not have been involved in the release to service of that particular aircraft since the last airworthiness review to avoid possible conflicts of interest.

1.1.4 For approved organisations with less than or equal to 10 maintenance staff and are unable to meet the requirements of 1.1.3, any of the following alternative arrangements is acceptable:
(a) The person shall not have been involved in the release to service of that particular aircraft within the last 28 days before the date of review.

(b) Independence shall be achieved through dedicated procedural arrangement. The review can be conducted by two authorised persons so that one reviews the work involved the other but not his/her own. In such case, the Certificate of Maintenance Review shall be signed by the two authorised persons concerned and the work certified by each individual shall be clearly identified on the Certificate.

(c) Contract out the issue of Certificate of Maintenance Review.

1.1.5 (a) Have successfully completed formal aeronautical maintenance training i.e. training supported by evidence addressing the following subjects:

(i) Relevant parts of initial and continuing airworthiness regulations;

(ii) Relevant parts of operational requirements and procedures, if applicable;

(iii) The organisation’s exposition;

(iv) Knowledge of a relevant sample of the type(s) of aircraft gained through a formalised training course. These courses should be to at least HKAR-66 Level 1 general familisation standard.

Note: ‘Relevant sample’ means that the courses should cover typical systems embodied in those aircraft within the organisation’s scope of approval. In practical terms, as a minimum this should cover at least one aircraft type for each subcategory.
(b) Have achieved the agreed standard in an examination e.g. oral assessment set by the organisation in conformity with Appendix No. 2 to Sub-section 1.8-13 and based upon subparagraphs (i) to (vi).

(i) Legislation and requirement for the issue of Certificate of Maintenance Review and the responsibilities of a signatory of the Certificate of Maintenance Review.

(ii) The form and implementation of the Approved Maintenance Schedule for the type of aircraft concerned.

(iii) The details of the systems and procedures contained in the organisation exposition and the associated documents, together with the requirements of the organisation for their implementation.

(iv) The maintenance support systems which are related to continuing airworthiness, e.g. reliability programmes, defect control, production control, development engineering, training, certification authority and modification control.


(vi) The form and implementation of mandatory inspections/modifications as required by HKAR-1 Sub-section 1.6-6 for the type of aircraft reviewed.

1.2 Prospective Certificate of Maintenance Review signatory can only be issued with an authorisation when formally accepted by the Director-General e.g. via approval of the respective exposition after satisfactory completion of a maintenance review under supervision.

1.3 The approved organisation shall ensure that Certificate of Maintenance Review signatory can demonstrate appropriate recent continuing airworthiness management experience.
1.4 Certificate of Maintenance Review signatories shall be identified by listing each person in the organisation exposition together with their authorisation reference.

1.5 The approved organisation shall maintain a record of all Certificate of Maintenance Review signatories which shall include details of any appropriate qualification held together with a summary of relevant continuing airworthiness management experience and training and a copy of the authorisation. This record shall be retained until two years after the Certificate of Maintenance Review signatory have left the organisation.

2 PERSONS AUTHORISED TO ISSUE CERTIFICATE OF RELEASE TO SERVICE FOR AIRCRAFT MAINTENANCE

2.1 Authorisations to issue Certificate of Release to Service shall be granted in accordance with HKAR-145.

3 PERSONS AUTHORIZED TO ISSUE A CERTIFICATE OF FITNESS FOR FLIGHT

3.1 Authorisations to issue a Certificate of Fitness for Flight shall be granted only to persons who comply with subparagraphs (a) to (d).

(a) Be age 21 or over.

(b) Have completed a course of training which complies with Appendix No. 2 to Sub-section 1.8-13, and relevant to the scope of the Authorisation with satisfactory examination results.

(c) Have been trained and have passed an examination on relevant company procedures.

(d) Be the holder of a current appropriately Type Rated Category B1 or Category C HKAR-66 Aircraft Maintenance Licence issued by the Director-General.

4 PERSONS AUTHORIZED TO ISSUE CERTIFICATE OF RELEASE TO SERVICE OR AUTHORIZED RELEASE CERTIFICATE FOR AIRCRAFT COMPONENT MAINTENANCE

4.1 Authorisations to issue Certificate of Release to Service or Authorised Release Certificate shall be granted only to persons who comply with subparagraphs (a) to (c).
(a) Be age 21 or over.

(b) Must show minimum specific periods of engineering experience relating to the maintenance of aircraft components of 3 years.

(c) Must also show minimum specific periods of engineering experience relating to the maintenance of relevant aircraft components of 24 months, 12 months of which must be in the 2 years immediately preceding the date of application.

(d) Have completed a course of training which complies with Appendix No. 2 to Sub-section 1.8-13, and relevant to the scope of the Authorisation with satisfactory examination results.

(e) Have been trained and have passed an examination on relevant company procedure.

5 VALIDITY OF AUTHORISATIONS

5.1 Authorisations granted in accordance with paragraphs 1, 2 and 3 shall only be used, subject to their conditions of validity, whilst the holder is in the employ of the approved organisation which issued them and the holder's licence, if any, remains valid. The approved organisation shall provide authorised persons with a copy of all Personal Authorisation Certificates, in either documented or electronic format, issued to them whilst in its employ.

5.2 The following samples are Personal Authorisation Certificates. The Director-General may accept proposals to vary the format and content of the Authorisation Certificate provided that such variations give, at least, an equivalent standard to that intended by the HKAR.
<table>
<thead>
<tr>
<th>Date and Stamp</th>
<th>NOTES</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>(1) In the event of confirmation of this authorisation being required from the CAD, application should be made to the CAD Airworthiness Office.</td>
</tr>
<tr>
<td>2</td>
<td>(2) Individuals wishing to ascertain further information on the full scope of the authorisations contained herein, should obtain this from the Organisation.</td>
</tr>
<tr>
<td>3</td>
<td>FOR CAD USE ONLY</td>
</tr>
<tr>
<td></td>
<td>I hereby confirm that to the best of my knowledge and belief the person named on this authorisation holds or has held on the dates specified the authorisations detailed.</td>
</tr>
</tbody>
</table>

Signature of Holder: .................................................................
Date: ............................................................................................

Signed: .................................................................
For Director-General of Civil Aviation

PERSONAL AUTHORISATION CERTIFICATE FOR AIRCRAFT MAINTENANCE

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SECTION 1.8

SUB-SECTION 1.8-14

APPROVAL OF ORGANISATIONS
TO RECOMMEND CERTIFICATE OF AIRWORTHINESS RENEWAL
OF AEROPLANES & ROTORCRAFT ABOVE 2730 KG MTWA

1 INTRODUCTION

1.1 The requirements of this Sub-section are applicable to the approval of organisations to make reports to the Director-General in respect of the functions specified in paragraph 1.2, in respect of aeroplanes and rotorcraft the Maximum Total Weight Authorised (MTWA) of which exceed 2730 kg. This approval is supplemental to HKAR-145 maintenance approvals, in accordance with the limitations of the approval. Organisations contracted to carry out aircraft fleet technical management in accordance with CAD360 may also apply for this approval.

1.2 An organisation may, subject to compliance with the requirements of this Sub-section, be approved in respect of aeroplanes and rotorcraft certificated in the Transport, Aerial Work or Private Category, to undertake assessments and to make recommendations to the Director-General in respect of the renewal of Certificates of Airworthiness (C of A) in accordance with Sub-section 1.3-4.

NOTE: All work undertaken in connection with the renewal of the C of A shall be supervised by an organisation approved for the purpose.

2 APPLICATION

2.1 Application for approval shall be made on Forms DCA61 and DCA61A, copies of which may be obtained from CAD Airworthiness Office which when completed should be returned to the same address.

NOTES:  
(1) Organisations currently approved for the maintenance of aircraft in accordance with HKAR-145 which desire supplemental approval in accordance with this Sub-section, should also follow this procedure.

(2) Organisations currently contracted to carry out aircraft fleet technical management in accordance with CAD360 which desire approval in accordance with this Sub-section, should also follow this procedure.

3 GRANT OF APPROVAL
3.1 Personnel

3.1.1 The applicant shall nominate for acceptance by the Director-General, personnel specifically for the purposes of paragraph 1.2 in accordance with this paragraph 3.1.1.

The nominated persons should comply with (a) to (e):

(a) Be the holder of a current Hong Kong Aircraft Maintenance Licence without type rating valid in Category B1 or B2 or C.

(b) Have at least eight years experience of aircraft maintenance, which includes at least two years recent experience involving the certification of maintenance.

(c) Hold a position within the approved organisation compatible with the responsibilities involved.

(d) Have successfully completed familiarisation training on the aircraft type for which the authorisation is to be granted.

(e) Have been trained in the procedures of the organisation.

(f) In cases of non-compliance with any of the provisions of (a) to (e), the applicant shall satisfy the Director-General that the nominated persons provide an equivalent level of confidence.

NOTES:  
(1) More than one such person may be nominated.

(2) The CAD Form DCA61A shall be used to nominate these personnel who must additionally be included in the company exposition (see paragraph 3.2).

(3) For personnel involved with airworthiness flight testing, including the evaluation, see HKAR-1 Sub-section 1.3-5.

3.1.2 In some instances, avionics and radio certifications may be made by personnel not permanently employed by the organisation, providing that the applicant can satisfy the Director-General that acceptable arrangements exist between the person and the organisation.

3.1.3 The applicant shall satisfy the Director-General that licensed, authorised and unlicensed staff are of sufficient numbers and are so experienced that they may reasonably be expected to undertake the volume and type of work appropriate to the recommendations to be made.
3.2 **Organisation and Procedures**

3.2.1 The applicant shall have a company exposition that meets the requirements of HKAR-145 or CAD360, where applicable and shall additionally include procedures specifying how the following will be achieved:

(a) C of A renewal application and recommendation.

(b) Audit of Flight Manual contents.

(c) Confirmation of mandatory modifications, Airworthiness Directives and inspection status.

(d) Audit of aircraft records.

(e) Conformity with CAD Approved Maintenance Schedule.

(f) Status of aircraft weight and balance data.

(g) Conformity with CAD approved aircraft radio installation (CAD Form DCA141).

(h) Compliance with CAD airworthiness flight test requirements.

(i) Review of outstanding allowable deferred defects.

(j) Physical survey of aircraft not more than thirty days prior to renewal recommendation to be completed in accordance with the approved company aircraft survey procedure.

(k) Confirmation and acceptance of signatories for CAD Form DCA202NR.

(l) Completion of CAD Form DCA202NR and submission to the Director-General with the associated supporting documentation.

(m) Quality Audit.

(n) Ensure that aircraft types or groups for which this Supplementary Approval has been granted are valid.
(o) Preservation and correlation of technical records to ensure traceability.

3.2.2 The organisation shall in the opinion of the Director-General be such as to ensure that, in all matters affecting airworthiness full and efficient co-ordination exists between individual licensed aircraft maintenance engineers, certifying staff and other members of the staff.

3.3 Publications and Information

3.3.1 The organisation shall make available to the staff concerned the necessary technical data, e.g. CAD publications, approved manuals, specifications, data sheets and related literature appropriate to the class of work for which approval is sought.

(a) The technical data shall consist of that issued from the manufacturers by way of maintenance manuals, micro-film, Service Bulletins and other forms of continuing airworthiness information.

(b) Written agreements shall be made by the organisation with the appropriate manufacturers, or other recognised suppliers, for the supply of amendments to the necessary publications. A suitable system for amendment control shall be provided.

(c) It shall be the responsibility of the user to ensure that the documents and technical data concerned are amended and up to date.

4 Continuation of Supplementary Approval

4.1 Changes of personnel nominated in accordance with paragraph 3.1.1 shall be notified to the Director-General in writing for acceptance.

4.2 The Director-General may revoke, suspend or vary the Terms of the supplementary approval if the conditions prescribed for approval are not maintained.
SECTION 1.8

SUB-SECTION 1.8-15

AEROPLANES AND ROTORCRAFT NOT EXCEEDING 2730 kg – MAINTENANCE ORGANISATIONS – GROUP M3

1 INTRODUCTION (See Appendix No. 1 to Sub-section 1.8-15)

1.1 The requirements of this Sub-section 1.8-15 are applicable to the Approval of Organisation to perform the functions specified in paragraph 1.2, in respect of aeroplanes and rotorcraft the Maximum Total Weight Authorised of which does not exceed 2730 kg.

1.2 An Organisation may, subject to compliance with the requirements of this Sub-section 1.8-15, be approved in respect of aeroplanes and rotorcraft certificated in the Transport Category (Passenger), the Transport Category (Cargo), the Aerial Work Category and the Private Category:-

(a) to undertake assessment and to make recommendations to the Director-General in respect of the renewal of Certificates of Airworthiness in accordance with Sub-section 1.3-4;

(b) to perform, in respect of the maintenance of aircraft (see Sub-section 1.6-2), such maintenance checks (see Appendix No. 1 to Sub-section 1.8-15) as are prescribed in the Approved Maintenance Schedule and which are required to be completed by an Organisation Approved by the Director-General for the purpose.

2 APPLICATION

Application for Approval shall be made on CAD Form DCA 61 and DCA 61D, copies of which may be obtained from the CAD Airworthiness Office, which when completed should be returned to the same address.

3 GRANT OF APPROVAL

3.1 Personnel (See Appendix No. 1 to Sub-section 1.8-15 Paragraph 2)
3.1.1 The Applicant shall nominate, for acceptance by the Director-General, personnel who will be employed specifically for the purpose of 1.2(a) in accordance with this paragraph 3.1.1.

(a) The holder of a Hong Kong Aircraft Maintenance Engineer's Licence: a HKAR-AMEL licence with Type Ratings in at least both Categories A and C or a HKAR-66 licence with Type Ratings in at least Sub-category B1, with acceptable experience in the light aircraft maintenance field, who will be responsible for recommendations to be made in accordance with 1.2(a).

NOTE: More than one such person may be nominated.

(b) Any additional holders of Hong Kong Aircraft Maintenance Engineer's Licence with Type Ratings appropriate to certifications to be made in accordance with 1.2(b), and who will be responsible for making such certifications.

3.1.2 Where, in some instances certifications, including HKAR-AMEL licence Categories X and R or HKAR-66 licence Sub-category B2, may need to be made by personnel not permanently employed by the Organisation, the Applicant shall satisfy the Director-General that acceptable arrangements exist between the particular person and the Organisation.

3.1.3 The Applicant shall satisfy the Director-General that licensed and unlicensed staff are of sufficient numbers and are so experienced that they may reasonably be expected to undertake the volume and type of work appropriate to the certifications to be made (see Appendix No. 1 to Sub-section 1.8-15, Paragraph 3.3).

3.2 Organisation and Procedures (see Sub-section 1.8-15 Appendix No. 1, Paragraph 3)

3.2.1 The Applicant shall satisfy the Director-General that the technical and administrative procedures in respect of:-

(a) matters affecting continued airworthiness;

(b) evaluation of technical information issued by manufacturers and Airworthiness Authorities,

are compatible with the likely volume of work.
3.2.2 Where applicable the terms of reference of persons nominated in accordance with 3.1.1, as applicable to the activities covered by the Approval, shall be the subject of agreement by the Director-General.

3.2.3 An Organisation approved as a Group M3 Organisation placing orders on suppliers and unapproved organisations shall satisfy itself that the origin of each item supplied is identified and that the item is acceptable and suitable for the intended purpose.

NOTE: Approved Organisations when undertaking work outside their terms of Approval are deemed to be unapproved.

3.3 Accommodation

3.3.1 Hangar accommodation, with adequate lighting and power supplies and of sufficient size to house the maximum number of aircraft expected to be worked on at any one time, shall be provided. Approval of the main premises may, for a particular case and with the agreement of the Director-General, be extended to cover other premises.

3.3.2 The accommodation shall include suitable areas where publications and drawings may be studied and where aircraft maintenance documents may be prepared and stored.

3.3.3 Adequate storage arrangements, together with the necessary records and systems for controlling aircraft components, parts and materials shall be provided.

3.4 Equipment

3.4.1 Adequate equipment, including general maintenance equipment and specialised tools shall be provided.

3.4.2 The calibration of test equipment shall be checked as frequently as is necessary to maintain confidence in the accuracy of the equipment.

3.5 Publications and Information

3.5.1 The Organisation shall make available to the staff concerned the necessary technical data, e.g. CAD publications, approved manuals,
specifications, data sheets and related literature appropriate to the
class of work for which Approval is sought.

(a) The technical data shall consist of that issued from the
manufacturers by way of maintenance manuals, micro fiche,
service bulletins and other forms of continuing airworthiness
information.

(b) Written agreements shall be made by the Organisation with
the appropriate manufacturers, or other recognised suppliers,
for the supply of amendments and changes of the
publications held. A suitable system for amending the
documents shall be provided.

(c) Where technical data is held on loan it shall be the
responsibility of the user to ensure that the documents
concerned are amended up to date.

4 CONTINUATION OF APPROVAL

4.1 The Organisation shall be maintained to the standard necessary to
undertake the work for which it is Approved, and the Director-General
shall, at all reasonable times, have access to the Organisation for the
purpose of assessing this standard at any given time.

4.2 Changes of personnel nominated in accordance with 3.1.1 shall be notified
to the Director-General in writing for acceptance.

4.3 The Director-General shall be consulted where there is any difficulty about
the interpretation of the requirements, the associated procedures, or on any
airworthiness matter which involves new problems or techniques.

4.4 The Director-General may revoke, suspend or vary the Terms of Approval
if the conditions prescribed for Approval are not maintained.
APPENDIX NO. 1 TO SUB-SECTION 1.8-15

ASSESSMENT OF SUITABILITY FOR APPROVAL

1 INTRODUCTION (See Sub-section 1.8-15, Paragraph 1)

The purpose of Approval in accordance with Sub-section 1.8-15 is to ensure that as a condition of renewal of the Certificate of Airworthiness at the end of the period of validity for aeroplanes or rotorcraft certificated in the:

(i) Transport and Aerial Work Categories, the Annual Check prescribed in the Approved Maintenance Schedule.

(ii) Private Category, the Annual Check prescribed in the Approved Maintenance Schedule which is coincident with the C of A renewal, will have been completed at an Organisation appropriately approved by the Director-General for the purpose.

2 PERSONNEL (See Sub-section 1.8-15, Paragraph 3.1)

The recommendation for the renewal of the Certificate of Airworthiness has to be made after consideration of, and compliance with, the requirements of Sub-section 1.3-4. As a minimum, the Organisation should have on its staff personnel holding Hong Kong Type Rated Licences in HKAR-AMEL licence Categories A and C or HKAR-66 licence Sub-category B1, covering the aircraft types involved. In particular, the person nominated in accordance with Sub-section 1.8-15, Paragraph 3.1.1(a) will have to hold an appropriate Hong Kong Aircraft Maintenance Engineer's Licence with Type Ratings in at least HKAR-AMEL Categories A and C or HKAR-66 Sub-category B1, with experience acceptable to the Director-General.

3 ORGANISATION AND PROCEDURES (See Sub-section 1.8-15, Paragraph 3.2)

3.1 The Applicant will have to satisfy the Director-General that the management of the Organisation will be conducted with due regard to the needs of continuing airworthiness.

3.2 The Organisation will have to be such, in the opinion of the Director-General, as to ensure that in all matters affecting airworthiness
full and efficient co-ordination exists between individual licensed aircraft maintenance engineers and other members of the staff.

3.3 In all areas of direct functions approved by the Director-General, e.g. the evaluation and reporting of flight tests, the Applicant will have to satisfy the Director-General that the persons nominated to exercise the authority are competent and adequately experienced. Suitable procedures, including provision for verification, will have to be defined and applied to ensure the accuracy of documents prepared for such approved functions.

3.4 When assessing an Organisation for Approval the Director-General will examine the methods used to control maintenance and this will include:-

(a) an assessment of the information contained in CAD Form DCA61D;

(b) the structure of the Organisation;

(c) the number of licensed aircraft maintenance engineers employed and the scope of the licences held by these engineers, appropriate to the Approval;

(d) the adequacy of the facilities, accommodation and equipment necessary to cover those types of aircraft appropriate to the Approval;

(e) the holding of technical publications and data for those types of aircraft appropriate to the Approval;

(f) the methods of assessing information promulgated by manufacturers and Airworthiness Authorities to ensure continued airworthiness;

(g) procedure for the preservation and correlation of technical records.