Hong Kong Aviation Requirements

HKAR-21

Certification of Aircraft and Related Products, Parts and Appliances, and of Design and Production Organisations

Issue 4 Revision 2
31 July 2023

CAD 21

Civil Aviation Department
Hong Kong, CHINA

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Please note that HKAR-21 is available at CAD website: http://www.cad.gov.hk/
Hardcopies will not be published.

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FOREWORD

1 Part-21 of the European Union Aviation Safety Agency (EASA) has been selected to provide where appropriate the content of the HKAR-21.

2 Amendments are incorporated into the text by means of a 'Revision' or a complete 'Re-issue'.

3 New, amended and corrected text in a ‘Revision’ is indicated by a marginal line.

HONG KONG AVIATION REQUIREMENTS

CHECKLIST OF PAGES

CERTIFICATION OF AIRCRAFT AND RELATED PRODUCTS, PARTS AND APPLIANCES, AND OF DESIGN AND PRODUCTION ORGANISATIONS

FIRST ISSUE, DATED 1 February 2007
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FOURTH ISSUE, DATED 20 July 2022
ISSUE 4 REVISION 1, DATED 30 December 2022
ISSUE 4 REVISION 2, DATED 31 July 2023

PREAMBLES

HKAR-21

This HKAR-21 was issued on 1 February 2007 and became effective on the same date. The preambles are intended to be a summarised record of the main changes introduced by each amendment of HKAR-21.

Issue 1 ***1 February 2007***

- New requirements for certification of aircraft and related products, parts and appliances, and of design and production organisations.

Issue 1 Revision 1 ***15 April 2007***

- Introduced the Hong Kong Parts Manufacturer Approval (HPMA) in Subpart K.

Issue 1 Revision 2 ***31 January 2009***

- Amended HKAR 21.92(b) to specify the applicant should have sound knowledge of the design principles embodied in the aircraft type being modified.
- Amended HKAR 21.139(b) to include 'software quality assurance' as an element of a quality system.
- Amended HKAR 21.432(b) to specify the applicant should have sound knowledge of the design principles embodied in the aircraft type being repaired.
- Amended Section 2 AMC page 2-0-1 to indicate 'HKAR-21' explicitly.
- Deleted AMC 21.91 and added AMC 21.92(a).

Introduced new Section 3 (Guidance Material).

Issue 1 Revision 3 ***30 November 2009***

- Added AMC No. 2 to HKAR 21.163(c) to refer HKAR-2 Chapter 31 for use and instructions for the completion of the Authorised Release Certificate (CAD Form One).
- Added AMC 21.307(a) to refer HKAR-2 Chapter 31 for use and instructions for the completion of the Authorised Release Certificate (CAD Form One)

Issue 2 ***15 August 2011***

- Added Subpart I Noise Certificate in Section 1.
- Added AMC 21.112 and 21.113(a) for Supplemental Type Certificate (STC) in Section 2

- Amended GM 21.90 for Changes to Type Certificates in Section 3.
- Added GM 21.91 & GM 2 to HKAR 21.435(a) in Section 3.
- Added GM 21.111 for Supplemental Type Certificate (STC) in Section 3.
- Added GM 21.431 for Subpart M Repair in Section 3.
- Added Appendix 1 to provide sample Project Specific Certification Plan (PSCP).
- Added Appendix 2 to provide sample Compliance Checklist for STC project.

Issue 2 Revision 1 ***15 November 2011***

- Deleted AMC 21.92(a).
- Added AMC 21.113(a)(6) for payment of deposit for application of STC and VSTC.
- Added AMC 21.113(a)(7) for variation against HKAR 21.111.
- Amended GM 21.90 for acceptance of non-CAD approved design changes.
- Amended Appendix B to GM 21.91(2)(2.5) to include rotating parts under major design change.
- Editorial changes in GM 21.111.

Issue 2 Revision 2 ***21 March 2012***

- Amended HKAR 21.606(c).
- Amended HKAR 21.609(f).
- Amended AMC 21.608 for revised DDP format.

Issue 3 ***1 May 2012***

- Added Subpart H Certificates of Airworthiness in Section 1.
- Amended HKAR 21.801(b) for nationality and registration marks of aircraft.
- Added Subpart H Certificates of Airworthiness in Section 3.

Issue 3 Revision 1 ***10 December 2012***

- Amended address and telephone number of CAD in Page ii.

Issue 3 Revision 2 ***5 December 2014***

- Amended HKAR 21.18 for noise certification requirements for adoption of Amendment 11 to ICAO Annex 16 Volume I.
- Added HKAR 21.204(d) to include verification of application for noise certificate by HKAR-183 ODA.
- Added GM 21.204(a) guidance materials for application for noise certificates.

Issue 3 Revision 3 ***31 August 2015***

- Editorial changes in HKAR 21.11.

Issue 3 Revision 4 ***29 September 2017***

- Amended GM 21.90 to clarify which design changes require Hong Kong approvals and to provide details of Arrangements with other civil aviation authorities.
- Editorial changes in Appendix B to GM 21.91 paragraph 2.6(e), GM 21.111 and GM 21.174(a)3.
- Added GM 21.204(a)1.i to require deposit payment for application for noise certificates.
- Added GM 21.204(a)4 for introduction of Appendix 3.
- Amended GM 21.431 to clarify which repair designs require Hong Kong approvals and to provide details of Arrangements with other civil aviation authorities.
- Added Appendix 3 to provide summary of noise requirements.

Issue 3 Revision 5 ***31 October 2018***

- Added a new item (c) to HKAR 21.18 to address carbon dioxide (CO_2) emission requirements.
- Renumbered the original item (c) of HKAR 21.18 to item (d) and amended the referenced paragraphs.
- Changed ‘AMC 21.16(a)’ to ‘AMC 21.16A’.
- Added AMC 21.18(c) to address the designation of applicable environmental protection requirements and certification specifications for carbon dioxide (CO_2) emissions.

Issue 4 ***20 July 2022***

- Adopted the EASA Part 21 - Easy Access Rules for Airworthiness and Environmental Certification (Regulation (EU) No 748/2012) published in March 2021 where applicable and as appropriate.
- Editorial changes to put the corresponding acceptable means of compliance (AMC) and the guidance materials (GM) under the requirement.
- Update the source reference of CAD Form One

Issue 4 Revision 1 ***30 December 2022***

- Amended AMC to HKAR 21.16A to clarify the certification specifications adopted by the Director-General.
- Editorial changes in HKAR 21.118A(a)2.
- Amended HKAR 21.174(b)5 to clarify the use of HKAR-183 organisation to recommend the issuance of a Certificate of Airworthiness.

Issue 4 Revision 2 ***31 July 2023***

- Amended HKAR 21.174(b)5 to clarify the use of HKAR-183 organisation to recommend the issuance of a Certificate of Airworthiness.
- Editorial change in HKAR 21.179(a)1.
- Amended HKAR 21.307 for the eligibility of parts and appliances for installation.
- Added AMC to HKAR 21.307(b)(3), GM to HKAR 21. 307(b)(3) and GM to HKAR 21. 307(b)(6) for the eligibility of parts and appliances for installation.

SUBPART A GENERAL PROVISIONS

HKAR 21.1 Scope

This Subpart establishes general provisions governing the rights and obligations of the applicant for, and holder of, any certificate issued or to be issued in accordance with HKAR-21.

HKAR 21.2 Undertaking by another person than the applicant for, or holder of, a certificate

The actions and obligations required to be undertaken by the holder of, or applicant for, a certificate for a product, part or appliance under HKAR-21 may be undertaken on its behalf by any other natural or legal person, provided the holder of, or applicant for, that certificate can show that it has made an agreement with the other person such as to ensure that the holder's obligations are and will be properly discharged.

HKAR 21.3A Failures, malfunctions and defects

(a) **System for collection, investigation and analysis of data**

The holder of a type certificate, supplemental type certificate, Hong Kong Technical Standard Order (HTSO) authorisation, major repair design approval or any other relevant approval deemed to have been issued under HKAR-21 shall have a system for collecting, investigating and analysing 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 type certificate, supplemental type certificate, HTSO authorisation, major repair design approval or any other relevant approval deemed to have been issued under HKAR-21. Information about this system shall be made available to all known operators of the product, part or appliance and, on request, to any person authorised under other associated regulations or requirements.

(b) **Reporting to the Director-General**

1 The holder of a type certificate, supplemental type certificate, HTSO authorisation, major repair design approval or any other relevant approval deemed to have been issued under HKAR-21 shall report to the Director-General any failure, malfunction, defect or other occurrence of which it is aware related to a product, part, or appliance covered by the type certificate, supplemental type certificate, HTSO authorisation, major repair design approval or any other relevant approval deemed to have been issued under HKAR-21, and which has resulted in or may result in an unsafe condition.

2 These reports shall be made in a form and manner established by the Director-

General, as soon as practicable and in any case dispatched not later than 72 hours after the identification of the possible unsafe condition, unless exceptional circumstances prevent this.

(c) **Investigation of reported occurrences**

1 When an occurrence reported under paragraph (b) or HKAR 21.165(f)2 results from a deficiency in the design, or a manufacturing deficiency, the holder of the type certificate, supplemental type certificate, major repair design approval, HTSO authorisation, or any other relevant approval deemed to have been issued under HKAR-21, or the manufacturer as appropriate, shall investigate the reason for the deficiency 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.

2 If the Director-General finds that an action is required to correct the deficiency, the holder of the type certificate, supplemental type certificate, major repair design approval, HTSO authorisation, or any other relevant approval deemed to have been issued under HKAR-21, or the manufacturer as appropriate, shall submit the relevant data to the Director-General.

AMC No. 1 to HKAR 21.3A(a) Collection, investigation and analysis of data related to Flammability Reduction Means (FRM) reliability

Holders of a type certificate, supplemental type certificate or any other relevant approval deemed to have been issued under HKAR-21 and which have included a FRM in their design should assess on an on-going basis the effects of aeroplane component failures on FRM reliability. This should be part of the system for collection, investigation and analysis of data required by HKAR 21.3A(a). The applicant/holder should do the following:

(a) Demonstrate effective means to ensure collection of FRM reliability data. The means should provide data affecting FRM reliability, such as component failures.

(b) Unless alternative reporting procedures are approved by the Director-General, provide a report to the Director-General every six months for the first five years after service introduction. After that period, continued reporting every six months may be replaced with other reliability tracking methods found acceptable to the Director-General or eliminated if it is established that the reliability of the FRM meets, and will continue to meet, the exposure specifications of paragraph M25.1 of Appendix M to European Union Aviation Safety Agency (EASA) CS-25.

(c) Develop service instructions or revise the applicable aeroplane manual, according to a schedule approved by the Director-General, to correct any failures of the FRM that occur in service that could increase any fuel tank's Fleet Average Flammability Exposure to more than that specified by paragraph M25.1 of Appendix M to EASA CS-25.

AMC No. 2 to HKAR 21.3A(a) Collection, investigation and analysis of data related to Extended Diversion Time Operations (EDTO) significant occurrences

(a) Holders of a type certificate, supplemental type certificate or any other relevant approval deemed to have been issued under HKAR-21 and which affects EDTO capability should implement a specific tracking, reporting and resolution system for EDTO significant occurrences, suitable to ensure the initial and continued fleet compliance with the applicable EDTO reliability objectives. This system should be part of the system for collection, investigation and analysis of data required by HKAR 21.3A(a).

Appropriate coordination should exist between engine type certificate (TC) holder, propeller TC holder and Auxiliary Power Unit (APU) HTSO authorisation holder with the aircraft TC holder to ensure compliance with the EDTO reliability objectives.

(b) For tracking, reporting and resolution of EDTO significant occurrences refer to the latest edition of AMC 20-6 (see EASA AMC-20 document) published by EASA and Civil Aviation Document (CAD) 513 'Extended Diversion Time Operations (EDTO)' published by the Director-General.

AMC to HKAR 21.3A(b)2 Reporting to the Director-General

Within the overall limit of 72 hours the degree of urgency for submission of a report should be determined by the level of hazard judged to have resulted from the occurrence.

Where an occurrence is judged by the person identifying the possible unsafe condition to have resulted in an immediate and particularly significant hazard the Director-General expects to be advised immediately and by the fastest possible means (telephone, fax, e-mail, etc.) of whatever details are available at that time. This initial report must be followed up by a full written report within 72 hours. A typical example would be an uncontained engine failure resulting in damage to aircraft primary structure.

Where the occurrence is judged to have resulted in a less immediate and less significant hazard, report submission may be delayed up to the maximum of 72 hours in order to provide more details.

HKAR 21.3B Airworthiness directives

(a) An airworthiness directive means a document issued or adopted by the Director-General which mandates actions to be performed on an aircraft to restore an acceptable level of safety, when evidence shows that the safety level of this aircraft may otherwise be compromised.

(b) The Director-General shall issue an airworthiness directive when:

1 an unsafe condition has been determined by the Director-General to exist in an aircraft, as a result of a deficiency in the aircraft, or an engine, propeller, part or appliance installed on this aircraft; and

2 that condition is likely to exist or develop in other aircraft.

(c) When an airworthiness directive has to be issued by the Director-General to correct the unsafe condition referred to in paragraph (b), or to require the performance of an inspection, the holder of the type certificate, supplemental type certificate, major repair design approval, HTSO authorisation or any other relevant approval deemed to have been issued under HKAR-21, shall:

1 propose the appropriate corrective action or required inspections, or both, and submit details of these proposals to the Director-General for approval; and

2 following the approval by the Director-General of the proposals referred to under subparagraph 1, make available to all known operators or owners of the product, part or appliance and, on request, to any person required to comply with the airworthiness directive, appropriate descriptive data and accomplishment instructions.

(d) An airworthiness directive shall contain at least the following information:

1 an identification of the unsafe condition;

2 an identification of the affected aircraft;

3 the action(s) required;

4 the compliance time for the required action(s); and

5 the date of entry into force.

AMC to HKAR 21.3B(b) Unsafe condition

An unsafe condition exists if there is factual evidence (from service experience, analysis or tests) that:

(a) An event may occur that would result in fatalities, usually with the loss of the aircraft, or reduce the capability of the aircraft or the ability of the crew to cope with adverse operating conditions to the extent that there would be:

1 a large reduction in safety margins or functional capabilities; or

2 physical distress or excessive workload such that the flight crew cannot be relied upon to perform their tasks accurately or completely; or

3 serious or fatal injury to one or more occupants;

unless it is shown that the probability of such an event is within the limit defined by the applicable certification specifications; or

(b) There is an unacceptable risk of serious or fatal injury to persons other than occupants; or

(c) Design features intended to minimise the effects of survivable accidents are not performing their intended function.

Note 1: Non-compliance with applicable certification specifications is generally considered as an unsafe condition, unless it is shown that possible events resulting from this non-compliance do not constitute an unsafe condition as defined under paragraphs (a), (b) and (c).

Note 2: An unsafe condition may exist even though applicable airworthiness requirements are complied with.

Note 3: The above definition covers the majority of cases where the Director-General considers there is an unsafe condition. There may be other cases where overriding safety considerations may lead the Director-General to issue an airworthiness directive.

Note 4: There may be cases where events can be considered as an unsafe condition if they occur too frequently (significantly beyond the applicable safety objectives) and could eventually lead to consequences listed in paragraph (a) in specific operating environments. Although having less severe immediate consequences than those listed in paragraph (a), the referenced events may reduce the capability of the aircraft or the ability of the crew to cope with adverse operating conditions to the extent that there would be, for example, a significant reduction in safety margins or functional capabilities, a significant increase in crew workload, or in conditions impairing crew efficiency, or discomfort to occupants, possibly including injuries.

GM to HKAR 21.3B(d)4 Defect correction – sufficiency of proposed corrective action

Refer to EASA GM 21.A.3B(d)(4) as applicable.

HKAR 21.4 Coordination between design and production

Each holder of a type certificate, supplemental type certificate, HTSO authorisation, approval of a change to type certificate or approval of a repair design, shall collaborate with the production organisation as necessary to ensure:

(a) The satisfactory coordination of design and production required by HKAR 21.122, HKAR 21.133 and HKAR 21.165(c)2 as appropriate; and

(b) The proper support of the continued airworthiness of the product, part or appliance.

AMC to HKAR 21.4 Transferring of information on eligibility and approval status from the design holder to production organisations

Where there is a need to provide (normally outside the design organisation) a visible statement of approved design data or airworthiness, operational suitability or environmental protection data associated with the approved design data, the following minimum information must be provided. The need for a visible statement may be in relation to Company holding a production organisation approval (POA) in relation to HKAR 21.163(c).

The procedures related to the use of forms or other electronic means to provide this information must be agreed with the Director-General.

Information to be provided:

Company name: the name of the responsible design organisation (TC, STC, approval of repair or minor change design, HTSO authorisation holder) issuing the information.

Date: the date at which the information is released.

Eligibility: indicate the specific products or articles, in case of HTSO authorisation, for which data have been approved.

Identification: the part number of the part or appliance. Preference should be given to the use of the Illustrated Parts Catalogue (IPC) designation. Alternatively the reference to the instruction for continued airworthiness (e.g., SB, AMM, etc.) could be stated. Marking requirements of HKAR-21 Subpart Q should be taken into account.

Description: the name or description of the part or document should be given. In the case of a part or appliance preference should be given to use of IPC designation. The description is to include reference to any applicable HTSO authorisation or HPA marking.

Purpose of data: the reason for the provision of the information should be stated by the design approval holder.

Examples:

(a) A provision of approved design data to a production organisation to permit manufacture (AMC No. 1 to HKAR 21.133(b) and (c));
(b) Information regarding eligibility for installation (replacement parts, repair, modification, etc.); and
(c) Direct Delivery Authorisation (AMC No. 1 to HKAR 21.133(b) and (c)).

If the data is in support of a change or repair, then reference to the aircraft level approval should be given (make reference to the approved STC, change or repair).

Limitations/Remarks: state any information, either directly or by reference to supporting documentation that identifies any particular data or limitations (including specific importing requirements) needed by a production organisation to complete Block 12 of the CAD Form One.

Approval: provide reference information related to the approval of the data (Director-General document or DOA privilege).

Authorised signature: name and hand-written normal or electronic signature of a person who has written authority from the design organisation, as indicated in the procedures agreed with the Director-General.

HKAR 21.8 Charges

Each holder of a type certificate, supplemental type certificate, production organisation approval, design organisation approval, Hong Kong Parts Manufacturer Approval (HPMA), HTSO authorisation, approval of a change to type certificate or approval of a repair design, shall pay the charges prescribed by the Director-General. Failure to pay entitles the Director-General to suspend, but does not automatically render the certificate/approval invalid.

SUBPART B TYPE CERTIFICATES

HKAR 21.11 Scope

This Subpart establishes the procedure for issuing type certificates for products and establishes the rights and obligations of the applicants for, and holders of, those certificates.

AMC to HKAR 21.11 Acceptance or validation of type certificates

A type certificate issued by other civil aviation authorities may be accepted or validated by the Director-General.

GM to HKAR 21.11 Scope

Refer to the Cooperation Arrangement or Working Procedures/Arrangement between CAD and the respective authority in regards to the acceptance / validation of the product. The 'Arrangements' established with other civil aviation authorities are published in the Civil Aviation Department website.

HKAR 21.13 Eligibility

Any natural or legal person that has demonstrated, or is in the process of demonstrating, its capability in accordance with HKAR 21.14 shall be eligible as an applicant for a type certificate under the conditions laid down in this Subpart.

HKAR 21.14 Demonstration of capability

(a) An applicant for a type certificate shall demonstrate its capability by holding a design organisation approval, issued by the Director-General in accordance with Subpart J.

(b) Reserved.

(c) Reserved.

AMC to HKAR 21.14(a) Demonstration of capability

The demonstration of capability is not required if the applicant is the type certificate holder applying for validation of its original type certificate.

HKAR 21.15 Application

(a) An application for a type certificate shall be made in a form and manner established by the Director-General.

(b) An application for a type certificate shall include, as a minimum, preliminary descriptive data of the product, the intended use of the product and the kind of operations for which certification is requested. In addition, it shall include, or be supplemented after the initial application, a certification programme for the demonstration of compliance in accordance with HKAR 21.20, consisting of:

1 a detailed description of the type design, including all the configurations to be certified;

2 the proposed operating characteristics and limitations;

3 the intended use of the product and the kind of operations for which certification is requested;

4 a proposal for the initial type certification basis, operational suitability data (OSD) certification basis and environmental protection requirements, prepared in accordance with the requirements and options specified in HKAR 21.17A and 21.18;

5 a proposal for a breakdown of the certification programme into meaningful groups of compliance demonstration activities and data, including a proposal for the means of compliance and related compliance documents;

6 a proposal for the assessment of the meaningful groups of compliance demonstration activities and data, addressing the likelihood of an unidentified non-compliance with the type certification basis, operational suitability data certification basis or environmental protection requirements and the potential impact of that non-compliance on product safety or environmental protection. Based on this assessment, the application shall include a proposal for the Director-General's involvement in the verification of the compliance demonstration activities and data; and

7 a project schedule including major milestones.

(c) After its initial submission to the Director-General, the certification programme shall be updated by the applicant when there are changes to the certification project affecting any of the points 1 to 7 of point (b).

(d) An application for a type certificate for an aircraft shall include, or be supplemented

after the initial application, an application supplement for approval of the operational suitability data where applicable.

(e) An application for a type certificate for a large aeroplane or a large rotorcraft shall be valid for five years and an application for any other type certificate shall be valid for three years, unless the applicant demonstrates at the time of application that its product requires a longer time period to demonstrate and declare compliance and the Director-General agrees to that longer time period.

(f) In the case where a type certificate has not been issued, or it is evident that it will not be issued, within the time limit provided for in point (e), the applicant may:

1 submit a new application and comply with the type certification basis, operational suitability data certification basis and environmental protection requirements, as established and notified by the Director-General in accordance with HKAR 21.17A and 21.18 for the date of the new application; or

2 apply for an extension of the time period provided for in point (e) and propose a new date for the issuance of the type certificate. In that case, the applicant shall comply with the type certification basis, operational suitability data certification basis and environmental protection requirements, as established and notified by the Director-General in accordance with HKAR 21.17A and 21.18 for a date to be selected by the applicant. However, that date shall not precede the new date proposed by the applicant for the issuance of the type certificate by more than five years for an application for a type certificate for a large aeroplane or a large rotorcraft, and by more than three years for an application for any other type certificate.

AMC No. 1 to HKAR 21.15(a) Form and manner

The applicant should write to the Director-General if it intends to obtain the type certificate from HKCAD as the primary certification authority.

AMC No. 2 to HKAR 21.15(a) Form and manner - validation of type certificates

The applicant should file an application using the application form for 'APPLICATION FOR VALIDATION OF TYPE CERTIFICATE (VTC)' (DCA 543), which may be downloaded from the Hong Kong Civil Aviation Department (HKCAD) website.

The form should be completed in accordance with the instructions provided on the application form, and sent via the issuing authority of the original TC to the Director-General following the information provided on the application form.

AMC No. 1 to HKAR 21.15(b) Content of the certification programme

The certification programme is a document that allows the applicant and the Director-General to manage and control the evolving product type design or OSD, as well as the process of compliance demonstration by the applicant and its verification by the Director-General when required. The certification programme may be based on modules that may be updated independently. The level of detail in the certification programme depends on the complexity of the product and its intended use. In particular, the following information should typically be expected:

General

(a) Identification of the relevant personnel who make decisions affecting airworthiness, operational suitability and environmental protection, and who will interface with the Director-General, unless otherwise identified to the Director-General (e.g. within the DOA procedures).

(b) A project schedule including major milestones.

(c) Subcontracting arrangements for design, operational suitability, environmental protection and/or production as well as design organisation approval (DOA) responsibility sharing.

HKAR 21.15(b)1 'a detailed description of the type design, including all the configurations to be certified', which includes an overview of the:

(d) Architecture, functions, systems;

(e) Dimensions, design weights, payloads, design speeds;

(f) Engines and power/thrust rating;

(g) Materials and technologies;

(h) Maximum passenger seating capacity, minimum flight and cabin crew;

(i) Cabin configuration aspects;

(j) Options (e.g. weight variants, power/thrust rating variants, optional avionics equipment items, auxiliary power unit (APU) choices, brake options, tire options, floats, skids);

(k) Noise/emissions level; and

(l) Other items, if considered to be more appropriate, that address the specific aeronautical product.

HKAR 21.15(b)2 ‘proposed operating characteristics and limitations’, which includes:

(m) Operating speed limitations;

(n) Service ceiling, maximum airfield elevation;

(o) Cabin pressure;

(p) Limit load factors;

(q) Number of passengers, minimum crew, payload, range;

(r) Weight and centre-of-gravity (CG) envelope and fuel loading;

(s) Performance;

(t) Environmental envelope;

(u) Runway surface conditions; and

(v) Other items, if considered to be more appropriate, that address the specific aeronautical product;

HKAR 21.15(b)3 ‘the intended use of the product and the kind of operations for which certification is requested’, which includes:

(w) Category A or B (relevant for CS-27 and CS-29), ditching, take-off and landing on water, emergency floatation equipment;

(x) Extended overwater operation, high-altitude operation (above 41 000 ft);

(y) High-airfield operation, steep approach, short take-off and landing, extended-range twin-engine operations (ETOPS), all-weather operations (AWO), visual flight rules (VFR)/instrument flight rules (IFR), reduced vertical separation minimum (RVSM), required navigation performance (RNP) type, increased bank angles, single-pilot operation, flight into known icing conditions;

(z) Flight in ice crystal icing;

(aa) Engine operations in ice-forming conditions, helicopter hoist operations, operation on unpaved runway, operation on narrow runway;

(bb) Take-off and landing in tailwind;

(cc) Volcanic-ash operation (limitation or operation as per CS 25.1593 and CS-E 1050);

(dd) Design service goal (DSG)/limit of validity targets;

(ee) Fatigue missions (general description of assumptions for flight durations, main phases, and parameters, as appropriate); and

(ff) Other items, if considered to be more appropriate, that address the specific aeronautical product.

HKAR 21.15(b)4 'a proposal for the initial type certification basis, operational suitability data certification basis, where applicable, and environmental protection requirements, considering the requirements and options specified in HKAR 21.17A and 21.18'.

The proposed certification basis should include applicable certification specifications, proposed special conditions, proposed equivalent safety findings, as well as a proposed 'elect to comply' and proposed deviations, as applicable.

The applicant should provide detailed information about the proposed means of compliance with the applicable requirements identified under HKAR 21.15(b)4. The information provided should be sufficient for the Director-General to determine its level of involvement. This should include the following, as far as this information is available at the time of submission to the Director-General:

(gg) A compliance checklist addressing each requirement, the proposed means of compliance (see Appendix A to AMC to HKAR 21.15(b) below for the relevant codes), and the related compliance document(s);

(hh) Identification of industry standards (Society of Automotive Engineers (SAE), American Society for Testing and Materials (ASTM), European Organisation for Civil Aviation Equipment (EUROCAE), AeroSpace and Defence Industries Association of Europe (ASD), etc.), methodology documents, handbooks, technical procedures, technical documents and specifications specified in the type certificate data sheet, certification memoranda, policy statements, guidance material, etc., that should be followed in the demonstration of compliance;

(ii) When the compliance demonstration involves testing, a description of the ground and flight test article(s), test method(s), test location(s), test schedule, test house(s), test conditions (e.g. limit load, ultimate load), as well as of the intent/objective(s) of the testing; and

(jj) When the compliance demonstration involves analyses/calculations, a description/identification of the tools (e.g. name and version/release of the software programs) and methods used, the associated assumptions, limitations and/or conditions, as well as of the intended use and purpose; furthermore, the validation and verification of such tools and methods should be addressed.

For every aspect mentioned above, the applicant should clearly identify whether the demonstration of compliance involves any method (analysis or test) which is novel or unusual for the applicant. This should include any deviations from the published AMC to the relevant Certification Specifications.

Appendix A to AMC to HKAR 21.15(b) Means of compliance codes

Type of compliance	Means of compliance	Associated compliance documents
Engineering evaluation	MC0: (a) compliance statement (b) reference to design data (c) election of methods, factors, etc. (d) definitions	(a) Design data (b) Recorded statements
	MC1: design review	(c) Descriptions (d) Drawings
	MC2: calculation/analysis	(e) Substantiation reports
	MC3: safety assessment	(f) Safety analysis
Tests	MC4: laboratory tests	(g) Test programmes (h) Test reports (i) Test interpretations
	MC5: ground tests on related product(s)	
	MC6: flight tests	
	MC8: simulation	
Inspection	MC7: design inspection/audit	(j) Inspection or audit reports
Equipment qualification	MC9: equipment qualification	Note: Equipment qualification is a process that may include all previous means of compliance at equipment level.

AMC No. 2 to HKAR 21.15(b) Content of the certification programme for validation of type certificate

For validation of a type certificate which would be or was issued by the primary certification authority. The applicant should support the Director-General in examination of the type design record and certification documents held by the State of Design.

The certification programme would consist of the following:

(a) Familiarisation of the aircraft, its systems, structure, engine and operational characteristics, any significant differences from the type design previously validated by HKCAD (if applicable), and, in particular, any unusual or novel features;

(b) Assessment of the design standards, including any exemptions, Special Conditions and Findings of Equivalent Level of Safety;

(c) Assessment of the adequacy of Type Design for the compliance with the type certification basis as specified in GM to HKAR 21.17A;

(d) Review of in-service experience, including major defects currently under investigation and any corrective action;

(e) Initial Maintenance Requirements; and

(f) Continued Airworthiness review.

GM to HKAR 21.15(c) Update to the certification programme

HKAR 21.15(b) recognises that the initial submission of the certification programme may not be fully complete, e.g. due to schedule constraints of the design, analysis and testing activities.

Furthermore, even if the initial submission of the certification programme is complete, it may be necessary to amend it throughout the duration of the project.

The certification programme should be updated and resubmitted to the Director-General. In particular, updates to the following elements should be provided:

(a) Any complementary information that was not included in the initial submission of the certification programme;

(b) Any change in the intended use or kind of operations of the product itself, or of the aircraft on which the product is installed;

(c) A change in the key characteristics of the product such as but not limited to any declared limits that are intended to be recorded in the type certificate data sheet (TCDS);

(d) Any change in the product design or its characteristics that may affect the criteria used to assess the likelihood of an unidentified non-compliance with the type certification basis, OSD certification basis or the environmental protection requirements, including

the potential impact of that non-compliance on product safety or environmental protection, as defined in HKAR 21.15(b)6;

(e) Any change to the initial type certification basis, OSD certification basis or environmental protection requirements, as applicable to the product, regardless whether the change is initiated by the Director-General or by the applicant;

(f) Any change in the breakdown of the certification programme into compliance demonstration items;

(g) Any change in the proposed means of compliance, including its/their methodology;

(h) Any change in the structure of compliance documents that may affect the determination of Director-General's level of involvement (LoI);

(i) Any relevant change to the design organisation approval (DOA) holder's personnel (and design organisation (DO) suppliers) who are involved in the project; and

(j) Any changes to the schedule that impact on the Director-General's LoI.

Following each update to the certification programme as submitted by the applicant, Director-General may update the determination of its level of involvement.

GM No. 1 to HKAR 21.15(d) Reserved

GM No. 2 to HKAR 21.15(d) Reserved

GM No. 3 to HKAR 21.15(d) OSD content

"Operational Suitability Data (OSD)" means data, which are part of an aircraft type certificate or supplemental type certificate, consisting of all of the following:

(a) The minimum syllabus of pilot type rating training, including determination of type rating;

(b) The definition of scope of the aircraft validation source data to support the objective qualification of simulators or the provisional data to support their interim qualification;

(c) The minimum syllabus of maintenance certifying staff type rating training, including determination of type rating;

(d) Determination of type or variant for cabin crew and type specific data for cabin crew; and

(e) The master minimum equipment list.

GM No. 4 to HKAR 21.15(d) Application

SCOPE OF OPERATIONAL SUITABILITY DATA

In the application for the approval of operational suitability data, the TC applicant may apply for the approval of different types of operations. If the aircraft is certified for certain types of operations (e.g. EDTO, RNP, LVO), the impact on the OSD constituents of HKAR 21.15(d) should be addressed.

The five defined OSD constituents are listed in GM No. 3 to HKAR 21.15(d). They may not be applicable to all aircraft types. The content of each OSD constituents is defined in the relevant certification specification and may be approved under a type certificate (TC), supplemental type certificate (STC) or change to those certificates. Each OSD constituent can have a part that is mandatory for the end user (operator, training organisation, etc.) and a part that is not mandatory (recommendation) for the end user. However, both the mandatory and the non-mandatory part together are the OSD constituent. Furthermore, the OSD constituent always includes the elements required from the TC/STC applicant, as specified in HKAR 21.16A, and may include additional element at the request of the TC/STC applicant, but still as defined in the HKAR 21.16A.

HKAR 21.16A Certification specifications

The Director-General issues or adopts certification specifications, including certification specifications for operational suitability data, as standard means to demonstrate compliance of products, parts and appliances. Such specifications shall be sufficiently detailed and specific to indicate to applicants the conditions under which certificates will be issued, amended or supplemented.

AMC to HKAR 21.16A Certification specifications in HKAR-21

The Director-General adopts the certification specifications issued by the authority of the State of Design where there is an airworthiness certification arrangement made by the Director-General with that authority.

HKAR 21.16B Special conditions

(a) The Director-General will prescribe special detailed technical specifications, named special conditions, for a product, if the related certification specifications do not contain adequate or appropriate safety standards for the product, because:

1 the product has novel or unusual design features relative to the design practices on which the applicable certification specifications are based; or

2 the intended use of the product is unconventional; or

3 experience from other similar products in service or products having similar design features, has shown that unsafe conditions may develop.

(b) The special conditions shall contain such safety standards as the Director-General finds necessary to establish a level of safety equivalent to that established in the applicable certification specifications.

GM to HKAR 21.16B Special conditions

The term 'novel or unusual design features' should be judged in view of the applicable certification basis for the product. A design feature, in particular, should be judged to be a 'novel or unusual design feature' when the certification basis does not sufficiently cover this design.

The term 'unsafe condition' is used with the same meaning as described in GM to HKAR 21.3B(b).

The term 'newly identified hazards' is intended to address new risks that may be recognised in the design (e.g. questionable features) or its operational characteristics (e.g. volcanic ash) for which there is not yet enough in-service experience.

HKAR 21.17A Type certification basis

The Director-General shall establish the type certification basis and notify it to the applicant for a type certificate. The type certification basis shall consist of:

(a) The certification specifications for airworthiness designated by the Director-General from those applicable to the product at the date of application for that certificate, unless:

1 the applicant chooses to comply, or is required to comply in accordance with HKAR 21.15(f), with certification specifications which became applicable after the date of the application; If an applicant chooses to comply with a certification specification which became applicable after the date of the application, the

Director-General shall include in the type certification basis any other certification specification that is directly related; or

2 the Director-General accepts any alternative to a designated certification specification that cannot be complied with, for which compensating factors have been found that provide an equivalent level of safety; or

3 reserved.

(b) Any special condition prescribed by the Director-General in accordance with HKAR 21.16B.

GM to HKAR 21.17A Type certification basis

This GM addresses the type certification basis for a TC.

(a) Hong Kong Requirements

1 Air Navigation (Hong Kong) Order 1995; and

2 Hong Kong Airworthiness Notices (HKAN).

(b) Applicable Certification Specifications (CSs) (see HKAR 21.17A)

The type certification basis for a TC consists of the airworthiness CSs that were effective on the date of application and were applicable for that certificate.

The effectivity date of the initial application may be changed, as per HKAR 21.15(f)2, when the period of validity of an application for a type certificate is exceeded, or it is evident that it will be exceeded, and the applicant requests an extension.

The certification basis is then revised accordingly.

(c) Elect to comply (see HKAR 21.17A(a)1)

It is also possible for an applicant to elect to comply with a CS that entered into force after the date on which the applicant has submitted the application.

The Director-General should assess whether the proposed certification basis is appropriate to ensure that the 'elect to comply' proposal includes any other CSs that are 'directly related' to one or several of the CSs in it. Directly related CSs are those that are deemed to contribute to the same safety objective by building on each other's requirements, addressing complementary aspects of the same safety concern, etc. Typically, they are adopted simultaneously with, or prior to, the CSs with which the applicant has elected to comply.

(d) Equivalent Level of Safety

In cases in which the applicable CSs cannot be literally complied with, either fully or in part, the Director-General may accept a suitable alternative which provides an equivalent level of safety through the use of appropriate compensating factors.
In cases in which the requirements contain not only objectives but also prescriptive parts, an equivalent level of safety may be accepted if:

— the objectives are met by designs or features other than those required in the CSs; or

— suitable compensating factors are proposed.

(e) Reserved.

(f) Special Conditions (see HKAR 21.16B)

The Director-General may also prescribe special conditions in accordance with HKAR 21.16B. Guidance on special conditions is provided in GM to HKAR 21.16B.

HKAR 21.18 Designation of applicable environmental protection requirements and certification specifications for a type certificate

(a) The applicable noise requirements for the issue of a type certificate for an aircraft are prescribed according to the provisions of Chapter 1 of Annex 16, Volume I, Part II to the Chicago Convention on International Civil Aviation and:

1 for subsonic jet aeroplanes, Chapters 2, 3, 4 and 14, as applicable;

2 for propeller-driven aeroplanes, Chapters 3, 4, 5, 6, 10 and 14, as applicable;

3 for helicopters, Chapters 8 and 11, as applicable;

4 for supersonic aeroplanes, Chapter 12, as applicable; and

5 for tilt-rotors, Chapter 13, as applicable.

(b) The applicable emission requirements for the issue of a type certificate for an aircraft for preventions of intentional fuel venting for aircraft established in Annex 16 to the Chicago Convention, Volume II, Part II, Chapter 1 and 2.

(c) The applicable smoke, gaseous and particulate matter engine requirements for the issue of a type certificate for an aircraft and engine are prescribed in Annex 16 to the Chicago Convention, Volume II, Part III, Chapter 1 and:

1 for smoke and gaseous emissions of turbo-jet and turbofan engines intended for propulsion only at subsonic speeds, Chapter 2; and

2 for smoke and gaseous emissions of turbo-jet and turbofan engines intended for propulsion at supersonic speeds, Chapter 3.

3 for particulate matter emissions of turbo-jet and turbofan engines intended for propulsion only at subsonic speeds, Chapter 4.

(d) The applicable carbon dioxide (CO2) emission requirements for the issue of a type certificate for an aircraft are prescribed in Annex 16 to the Chicago Convention, Volume III, Part II, Chapter 1 and:

1 for subsonic jet aeroplanes, in Chapter 2; and

2 for subsonic propeller-driven aeroplanes, in Chapter 2.

AMC to HKAR 21.18(d) Designation of applicable environmental protection requirements and certification specifications – carbon dioxide (CO2) emissions

The Director-General will recognise valid aeroplane exemptions granted by an authority of the state responsible for production of the aeroplane provided that an acceptable process was used.

Note: Guidance on acceptable processes and criteria for granting exemptions is provided in the ICAO Environmental Technical Manual (Doc 9501), Volume III – Procedures for the CO_2 Emissions Certification of Aeroplanes.

HKAR 21.19 Changes requiring a new type certificate

Any natural or legal person proposing to change a product shall apply for a new type certificate if the Director-General finds that the change in design, power, thrust, or mass is so extensive that a substantially complete investigation of compliance with the applicable type certification basis is required.

HKAR 21.20 Demonstration of compliance with the type certification basis, operational suitability data certification basis and environmental protection requirements

(a) Following the acceptance of the certification programme by the Director-General, the applicant shall demonstrate compliance with the applicable type certification basis, the applicable operational suitability data certification basis and environmental protection requirements, as established and notified to the applicant by the Director-

General in accordance with HKAR 21.17A and HKAR 21.18, and shall provide to the Director-General with the means by which such compliance has been demonstrated.

(b) The applicant shall report to the Director-General any difficulty or event encountered during the process of demonstration of compliance that may have an appreciable effect on the risk assessment under HKAR 21.15(b)6 or on the certification programme, or may otherwise necessitate a change to the level of involvement of the Director-General previously notified to the applicant.

(c) The applicant shall record justification of compliance within compliance documents as referred to in the certification programme.

(d) After completion of all demonstrations of compliance in accordance with the certification programme, including any inspections and tests in accordance with HKAR 21.33, and after all flight tests in accordance with HKAR 21.35, the applicant shall declare that:

1 it has demonstrated compliance with the type certification basis and environmental protection requirements, as established and notified by the Director-General, following the certification programme as accepted by the Director-General; and

2 no feature or characteristic has been identified that may make the product unsafe for the uses for which certification is requested.

(e) The applicant shall submit to the Director-General the declaration of compliance provided for in point (d). Where the applicant holds an appropriate design organisation approval, the declaration of compliance shall be made in accordance with Subpart J and submitted to the Director-General.

GM to HKAR 21.20 Compliance demonstration process

HKAR 21.20 applies to the compliance demonstration process for a type certificate (TC) and, by cross references to HKAR-21 Subpart D and E, to compliance demonstration processes for major changes to a TC (see HKAR 21.97(b)3) and a STC (see HKAR 21.115(b)4).

Applicants for a TC should apply HKAR 21.20 in full. Applicants for a major change to a TC (or a STC) are required (see HKAR 21.97(b)3 and HKAR 21.115(b)4) to apply HKAR 21.20 as applicable to the change.

'As applicable to the change' means that:

(a) The certification programme to be followed is the one prepared for the major change or STC in accordance with HKAR 21.93, as accepted by the Director-General; and

(b) The certification basis (consisting of the type certification basis, operational suitability data (OSD) certification basis, and the environmental protection requirements) is the one established by the Director-General in accordance with HKAR 21.101.

GM to HKAR 21.20(b) Reporting on the compliance demonstration process

The applicant should report to Director-General any unexpected difficulty or event encountered during the compliance demonstration that invalidates or appreciably affects the assumptions previously made, for example:

(a) An increase in the severity of the consequences of a certain condition (e.g. failure mode) of the product;

(b) Significantly reduced margin(s) for the 'pass–fail' criteria of the compliance demonstration;

(c) Changes to the test sequences and conditions that are not in line with the certification specifications or guidance;

(d) An unusual interpretation of the results of the compliance demonstration; and

(e) Any significant failure or finding resulting from the tests performed as per HKAR 21.33 or HKAR 21.35.

The applicant should also evaluate whether the unexpected difficulty or event encountered will impact on the certification programme and, if necessary, amend it as per HKAR 21.15(c).

AMC to HKAR 21.20(c) Compliance documentation

(a) Compliance documentation comprises of one or more reports, drawings, specifications, calculations, analysis etc. and provides a record of the means by which compliance with the applicable type certification basis, the operational suitability certification basis and environmental protection requirements is demonstrated.

(b) Each compliance document should normally contain:

1 the reference of the certification specifications, special conditions or environmental protection requirements addressed by the document;

2 substantiation data demonstrating compliance (except test or inspection programmes/plans);

3 a statement by the applicant declaring that the document provides the proof of compliance for which it has been created; and

4 the appropriate authorised signature.

(c) Each compliance document should have a number and issue date. The various issues of a document should be controlled and comply with HKAR 21.55.

GM to HKAR 21.20(d) Final statement

All compliance demonstrations in accordance with the certification programme, including all the inspections and tests in accordance with HKAR 21.33 and all flight tests in accordance with HKAR 21.35, should be completed before issuance of the final statement of compliance required by HKAR 21.20(d).

If so agreed by the Director-General, some compliance documentation may be produced after issuance of the final statement of compliance required by HKAR 21.20(d).

'No feature or characteristics' in HKAR 21.20(d)2 means the following: while every effort is made to address in the applicable certification basis all the risks to product safety or to the environment that may be caused by the product, experience shows that safety-related events may occur with products in service, even though compliance with the certification basis is fully demonstrated. One of the reasons may be that some existing risks are not properly addressed in the certification basis. Therefore, the applicant has to declare that they have not identified any such features or characteristics.

HKAR 21.20 also applies by reference to minor changes, in which case the risk to product safety or to environmental protection is quite low. Nevertheless, minor changes should not be approved if either the applicant/design organisation approval (DOA) holder approving minor changes under their privileges, or Director-General, is aware of a feature or characteristic that may make the product unsafe for the uses for which certification is requested.

HKAR 21.21 Requirements for the issuance of a type certificate

(a) In order to be issued a product type certificate, the applicant shall:

1 demonstrating its capability in accordance with HKAR 21.14;

2 comply with HKAR 21.20;

3 demonstrate that the engine and propeller, if installed in the aircraft:

(i) have a type certificate issued in accordance with HKAR-21; or

(ii) have been demonstrated to be in compliance with the aircraft type certification basis established and the environmental protection requirements designated and notified by the Director-General as necessary to ensure the safe flight of the aircraft.

(b) By derogation from paragraph (a)2, and at the request of the applicant included in the declaration referred to in HKAR 21.20(d), the applicant is entitled to have the aircraft type certificate issued before the applicant has demonstrated compliance with the operational suitability data certification basis (where applicable), provided that the applicant demonstrates such compliance before the date at which those data are to be actually used.

HKAR 21.31 Type design

(a) The type design shall consist of:

1 the drawings and specifications, and a listing of those drawings and specifications, necessary to define the configuration and the design features of the product shown to comply with the applicable type certification basis and environmental protection requirements;

2 information on materials and processes and on methods of manufacture and assembly of the product necessary to ensure the conformity of the product;

3 an approved airworthiness limitations section of the instructions for continued airworthiness as defined by the applicable certification specifications; and

4 any other data allowing by comparison the determination of the airworthiness and, if relevant, the environmental characteristics of later products of the same type.

(b) Each type design shall be adequately identified.

HKAR 21.33 Inspections and tests

(a) Reserved.

(b) Before each test is undertaken during the demonstration of compliance required by HKAR 21.20, the applicant shall have determined:

1 for the test specimen, that:

(i) the materials and processes adequately conform to the specifications for the proposed type design;

(ii) the parts of the products adequately conform to the drawings in the proposed type design;

(iii) the manufacturing processes, construction and assembly adequately conform to those specified in the proposed type design; and

2 for the test and measuring equipment to be used for the test, that those are adequate for the test and appropriately calibrated.

(c) On the basis of the verifications carried out in accordance with point (b), the applicant shall issue a statement of conformity listing any potential non-conformity, together with a justification that this will not affect the test results, and shall allow the Director-General to make an inspection necessary to check the validity of that statement.

(d) The applicant shall allow the Director-General to:

1 review any data and information related to the demonstration of compliance; and

2 witness or carry out any test or inspection conducted for the purpose of the demonstration of compliance.

(e) For all the tests and inspections witnessed or carried out by the Director-General in accordance with point (d)2:

1 the applicant shall submit to the Director-General a statement of conformity provided for in point (c); and

2 no change that affects the validity of the statement of conformity shall be made to the test specimen, or the test and measuring equipment, between the time the statement of conformity provided for in point (c) was issued and the time the test specimen is presented to the Director-General for test.

AMC to HKAR 21.33 Inspections and tests

Use of the term ‘applicant’: HKAR 21.33 is applicable to type certification, major changes, major repairs and supplemental type certificates (STCs). Despite using the word ‘applicant’, it is also applicable to major changes, major repairs and STCs approved under DOA privileges (see HKAR 21.263(c)5, 8 or 9).

Proposed type design: this term defines the type design (or the portion of the type design) as it is determined at the time when the inspection or test is undertaken.

Statement of conformity: for each certification inspection or test, the statement of conformity issued in accordance with HKAR 21.33(c) must address the conformity of the test specimen

(see HKAR 21.33(b)1) as well as of the test equipment and measuring equipment (see HKAR 21.33(b)2).
Conformity of the test specimen: the statement of conformity required by HKAR 21.33(c) is intended to ensure that the manufactured test specimen adequately represents the proposed type design. Possible types of non-conformity may be the following:

(a) Non-conformity between the design of the test specimen and the proposed type design at the time of the test. These are typically identified in the early stage of the test planning, and should be addressed as early as possible (e.g. in the test plan). There may be several reasons for such a non-conformity: to account for interfaces with the test equipment, to conservatively cover several or future design configurations, etc.

(b) Non-conformity between the manufactured test specimen and the design of the test specimen. Such a non-conformity may be the result of the manufacturing of the test specimen.

While it is convenient to define any possible non-conformity in (a) as early as possible, the applicant does not need to make the distinction between the two types of non-conformity above as long as they are explicitly addressed and justified in the statement of conformity or by cross reference to the test plan or other documents.

Type certification is typically an iterative process in which the design is under continuous evolution. If the type design evolves after the time of the inspection or test, then the final type design should be checked against the proposed type design (as it was at the time of the inspection or test), and the differences (if any) should be analysed to ensure that the inspection or test results are representative of the final configuration. However, such changes made to the type design may lead to the invalidation of the inspection or test results and a need to repeat the inspection or test. It is recommended that the design organisation should have a thorough configuration management process to track the evolving type design.

Conformity of test and measuring equipment: the configuration of the test and measuring equipment should be defined in the test plan and include the following:

(a) Definition/design of the test equipment (relevant tools, mechanical parts, electronic components used to execute the test); and

(b) Definition of the measuring equipment:

- type/model of sensors, together with their technical characteristics;
- position and orientation of exciters and sensors; and
- electronic measuring equipment (in some cases, this may also include the acquisition and post-processing of data).

The configuration of the test and measuring equipment should be defined and controlled through certification test plans and supporting documentation, according to the design assurance system, if applicable. The test plan should also include the following elements:

(a) The test cases, methods, and procedures for test execution;

(b) The pass–fail criteria; and

(c) Pre-, during- and post-test inspections.

The statement of conformity of HKAR 21.33(c) should confirm that the test and measuring equipment conform to its purpose, and that the sensors and measuring system are appropriately calibrated. Any non-conformity should be assessed, and it should be justified that it will not compromise the test purpose and results. This can be done either in the statement of conformity or by cross reference to other documents (test minutes of meetings, test notes, etc.).

Use of the term 'adequate': the test specimen, as well as the test and measuring equipment, are considered to be 'adequate' as long as the test execution on the manufactured test specimen (including any non-conformity) and the use of the installed test set-up does not compromise the test purpose and results (for example, by providing better performance than the proposed type design, or masking any potential failure mode or behaviour).

Changes that affect the validity of the statement of conformity (see HKAR 21.33(e)2): if changes need to be introduced to the test specimen or to the test and measurement equipment after the statement of conformity is issued (and before the test is undertaken), the statement of conformity must be updated. The updated statement of conformity must be made available to the Director-General before the test if the Director-General has informed the applicant that it will witness or carry out the tests.

Development versus certification tests: sometimes, tests of specimens that conform to a preliminary design, but are not intended for certification (known as development tests), are performed as part of a risk control strategy and to develop knowledge of a subject. Problems and failures found during development are part of the process of increasing the understanding of the design, including its failure modes and the potential for optimisation. Such development tests do not need to meet the requirements of HKAR 21.33.

Any planned test event should be classified in advance as either a development test or a certification test. Tests that support the compliance demonstration should be classified as certification tests.

Nevertheless, if agreed by the Director-General, it is acceptable for a development test to finally form part of the compliance demonstration, and it may be declared afterwards to be a certification test as long as it meets the requirements of HKAR 21.33. For this reason, it is important to keep the configuration of such tests under the control of the design organisation.

In addition to this, the level of involvement (LoI) notified by the Director-General should be taken into account: if the Director-General has determined that it will witness or conduct a certain test, this test may need to be repeated so that the Director-General can witness or conduct the test.
If the test specimen used for a certification test has already undergone a series of previous tests that may affect or ultimately invalidate its acceptance as required by HKAR 21.33(b), this aspect should be considered when issuing the statement of conformity required by HKAR 21.33(c), and specific analyses or inspections may be required to support such a statement.

Because of the above aspects, the Director-General advises applicants to inform the Director-General if they intend to conduct a campaign of development tests that may eventually be used as certification tests.

Availability of compliance data (see HKAR 21.33(d)1): data and information requested from the applicant for review should be made available in a reliable and efficient way that is agreed between the applicant and the Director-General.

HKAR 21.33(d)1 refers to any data or information related to compliance data; the scope of that requirement is therefore not limited to inspections and tests. In particular, HKAR 21.33(d)1 is not limited to data and information related to compliance demonstration items (CDIs) in which the Director-General is involved.

GM to HKAR 21.33(d) Inspections and tests

The applicant should inform the Director-General sufficiently in advance about the execution of inspections and tests that are used for compliance demonstration purposes unless the Director-General has explicitly excluded these inspections and tests from its involvement.

Additionally, the applicant may propose to the Director-General to perform or witness flight or other tests of particular aspects of the product during its development and before the type design is fully defined. However, before the Director-General performs or witnesses any flight test, the applicant should have performed these tests already before the Director-General and should ensure that no features of the product preclude the safe conduct of the evaluation requested.

The Director-General may require any such tests to be repeated once the type design is fully defined to ensure that subsequent changes have not adversely affected the conclusions from any earlier evaluation.

A statement of conformity as per HKAR 21.33(c) is also required for the above tests.

HKAR 21.35 Flight tests

(a) Flight testing for the purpose of obtaining a type certificate shall be conducted in accordance with conditions for such flight testing specified by the Director-General.

(b) The applicant shall make all flight tests that the Director-General finds necessary:

1 to determine compliance with the applicable type certification basis and environmental protection requirements, and

2 to determine whether there is reasonable assurance that the aircraft, its parts and appliances are reliable and function properly for aircraft to be certificated under HKAR-21, except for,

(i) sailplanes and powered sailplanes,

(ii) balloons and airships, and

(iii) aeroplanes of 2,722 kg or less maximum take-off mass (MTOM).

(c) Reserved.

(d) Reserved.

(e) Reserved.

(f) The flight tests prescribed in subparagraph (b)2 shall include:

1 for aircraft incorporating turbine engines of a type not previously used in a type certificated aircraft, at least 300 hours of operation with a full complement of engines that conform to a type certificate; and

2 for all other aircraft, at least 150 hours of operation.

GM to HKAR 21.35(b)2 Objective and content of function and reliability testing

(a) **Objective**

The objective of this testing is to expose the aircraft to the variety of uses, including training, that are likely to occur when in routine service to provide an assurance that it performs its intended functions to the standard required for certification and should continue to do so in service.

(b) **Content of function and reliability testing**

The testing should cover both routine operations and some simulation of abnormal conditions. The details of the programme should be agreed with the Director-General prior to commencement of testing.
It may be possible to combine this testing with any required to demonstrate compliance with the applicable EASA CS. This will be agreed on a case-by-case basis with the Director-General.
Where possible, testing conditions should be defined with the co-operation of an operator.

A substantial proportion of the flying should be on a single aircraft. The flying should be carried out to a continuous schedule on an aircraft that is very close to the final type design, operated as though it were in service and should include a range of representative ambient operating conditions and airfields.

GM to HKAR 21.35(f)1 Flying time for function and reliability testing

All flying carried out with engines and associated systems not significantly different from the final type certificate standard may count towards the 300 hours airframe flight time required by HKAR 21.35(f)1. At least 150 of the 300 flying hours should be conducted on a dedicated production configured aircraft. The requirement for 300 hours relevant flight time whenever a new turbine engine is incorporated applies regardless of whether the airframe/engine combination is subject to a new type certificate or is to be certificated as a change or supplement to an existing type certificate.

GM to HKAR 21.35(f)2 Flying time for function and reliability testing

All flying carried out on an aircraft not significantly different from the final type design may count towards the 150 hours airframe flight time required by HKAR 21.35(f)2.

HKAR 21.41 Type certificate

The type certificate shall include the type design, the operating limitations, the type certificate data sheet for airworthiness and emissions, the applicable type certification basis and environmental protection requirements with which the Director-General records compliance, and any other conditions or limitations prescribed for the product in the applicable certification specifications and environmental protection requirements. The aircraft type certificate shall include in addition the applicable operational suitability data certification basis, the operational suitability data and the type certificate data sheet for noise. The aircraft type certificate data sheet shall include the record of CO2 emissions compliance and the engine type certificate data sheet shall include the record of exhaust emissions compliance.

HKAR 21.44 Obligations of the holder

Each holder of a type certificate shall:

(a) Undertake the obligations laid down in HKAR 21.3A, HKAR 21.3B, HKAR 21.4, HKAR 21.55, HKAR 21.57, HKAR 21.61 and HKAR 21.62; and, for this purpose, shall continue to meet the qualification requirements for eligibility under HKAR 21.14; and

(b) Specify the marking in accordance with Subpart Q.

HKAR 21.47 Transferability

Transfer of a type certificate may only be made to a natural or legal person that is able to undertake the obligations under HKAR 21.44, and, for this purpose, has demonstrated its ability to qualify under the criteria of HKAR 21.14.

HKAR 21.51 Duration and continued validity

(a) A type certificate will be issued for an unlimited duration. They shall remain valid subject to:

1 the holder remaining in compliance with HKAR-21; and

2 the certificate not being surrendered or revoked under the applicable administrative procedures established by the Director-General.

(b) Upon surrender or revocation, the type certificate shall be returned to the Director-General.

HKAR 21.55 Record keeping

All relevant design information, drawings and test reports, including inspection records for the product tested, shall be held by the type certificate holder at the disposal of the Director-General and shall be retained in order to provide the information necessary to ensure the continued airworthiness, continued validity of the operational suitability data and compliance with applicable environmental protection requirements of the product.

HKAR 21.57 Manuals

The holder of a type certificate shall produce, maintain and update master copies of all manuals required by the applicable type certification basis, the applicable operational suitability data certification basis and environmental protection requirements for the product, and provide copies, on request, to the Director-General.

HKAR 21.61 Instructions for continued airworthiness

(a) The holder of the type certificate shall furnish at least one set of complete instructions for continued airworthiness, comprising descriptive data and accomplishment instructions prepared in accordance with the applicable type certification basis, to each known owner of one or more aircraft, engine or propeller upon its delivery or upon issue of the first certificate of airworthiness for the affected aircraft, whichever occurs later and thereafter make those instructions available on request to any other person required to comply with any of the terms of those instructions. The availability of some manual or portion of the instructions for continued airworthiness, dealing with overhaul or other forms of heavy maintenance, may be delayed until after the product has entered into service, but shall be available before any of the products reaches the relevant age or flight-hours/cycles.

(b) In addition, changes to the instructions for continued airworthiness shall be made available to all known operators of the product and shall be made available on request to any person required to comply with any of those instructions. A programme showing how changes to the instructions for continued airworthiness are distributed shall be submitted to the Director-General.

HKAR 21.62 Availability of operational suitability data

The holder of the type certificate shall make available:

(a) At least one set of complete operational suitability data prepared in accordance with the applicable operational suitability certification basis, to all known Hong Kong operators of the aircraft, before the operational suitability data must be used by a training organisation or an Hong Kong operator; and

(b) Any change to the operational suitability data to all known Hong Kong operators of the aircraft; and

(c) On request, the relevant data referred to in paragraphs (a) and (b) above, to:

1 the Director-General responsible for verifying conformity with one or more elements of this set of operational suitability data; and

2 any person required to comply with one or more elements of this set of operational suitability data.

(SUBPART C RESERVED)

SUBPART D CHANGES TO TYPE CERTIFICATES

HKAR 21.90A Scope

This Subpart establishes the procedure for the approval of changes to type designs and type certificates, and establishes the rights and obligations of the applicants for, and holders of, those approvals. This Subpart also defines standard changes that are not subject to an approval process under this Subpart.

GM No. 1 to HKAR 21.90A Scope

(a) The term "changes to type designs" has the same meanings of "aircraft … is … modified …." or "modification" as stipulated in article 87(a) of Air Navigation (Hong Kong) 1995.

(b) Hong Kong approvals are issued under HKAR-21 by the Director-General or by the Design Organisations which are approved under Subpart J of HKAR-21. Changes to type design shall be supported by Hong Kong approvals or 'Arrangements' with other civil aviation authorities.

Note: Some design changes covered under 'Arrangements' require validation by the Director-General. Refer to details of subparagraph (d) below.

(c) The aircraft registered owner is responsible for: (i) compliance of additional airworthiness requirements stipulated in Air Navigation (Hong Kong) Order 1995 and Hong Kong Airworthiness Notices at aircraft level, (ii) implementation of OSD, and (iii) implementation of instructions for continued airworthiness where applicable.

(d) The 'Arrangements' established with other civil aviation authorities are published in the Civil Aviation Department website.

GM No. 2 to HKAR 21.90A Scope

The term 'changes to the type certificate' is consistently used in HKAR-21, Subpart D and E, as well as in the related AMC and GM. This term does not refer to changing the document that reflects the type certificate (TC) but to the concept of TC as defined in HKAR 21.41. It means that the processes for approval of changes, as described in the said two Subparts, do not only apply to changes to the type design, but may also apply to changes to:

(a) The operating limitations;

(b) The type certificate data sheet (TCDS) for airworthiness and emissions;

(c) The applicable type certification basis and environmental protection requirements with which the applicant has to demonstrate compliance;

(d) Any other conditions or limitations prescribed for the product by the Director-General;

(e) The applicable operational suitability data (OSD) certification basis;

(f) The OSD; and

(g) The TCDS for noise.

Note: OSD is only applicable to aircraft TCs and not engine or propeller TCs. Therefore, changes to OSD are only relevant for changes to aircraft TCs.

HKAR 21.90B Reserved

HKAR 21.91 Classification of changes to a type certificate

Changes to a type certificate are classified as minor and major. A 'minor change' has no appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, noise, fuel venting, exhaust emission, operational suitability data or other characteristics affecting the airworthiness of the product. Without prejudice to HKAR 21.19, all other changes are 'major changes' under this Subpart. Major and minor changes shall be approved in accordance with HKAR 21.95 or HKAR 21.97 as appropriate, and shall be adequately identified.

AMC to HKAR 21.91 Reclassification of a major change

Should reclassification of a major change be required, a recommendation should be made to the Director-General by using the application form 'Recommendation for Design Reclassification Acceptance' DCA 21J-1. This form is available from the CAD website.

The form should be completed in accordance with the instructions of the application form.

GM to HKAR 21.91 Classification of changes to type certificate

1 PURPOSE OF CLASSIFICATION

(a) Classification of changes to a type certificate (TC) into MAJOR or MINOR is to determine the approval route to be followed in HKAR-21 Subpart D, i.e., either HKAR 21.95 or HKAR 21.97, or alternatively whether application and approval has to be made in accordance with HKAR-21 Subpart E.

2 INTRODUCTION

2.1 HKAR 21.91 proposes criteria for the classification of changes to a TC as minor or major.

(a) This GM is intended to provide guidance on the term 'appreciable effect' affecting the airworthiness of the product or affecting any of the other characteristics mentioned in HKAR 21.91, where 'airworthiness' is interpreted in the context of a product in conformity with type design and in condition for safe operation. It provides complementary guidelines to assess a change to the TC in order to fulfil the requirements of HKAR 21.91 and HKAR 21.117 where classification is the first step of a procedure.

Note: For classification of Repairs see GM to HKAR 21.435(a).

(b) Although this GM provides guidance on the classification of major changes, as opposed to minor changes as defined in HKAR 21.91, the GM to HKAR 21.91and HKAR 21.91 are deemed entirely compatible.

2.2 For an HTSO authorisation, HKAR 21.611 gives specific requirements for design changes to HTSO articles.

3 ASSESSMENT OF A CHANGE FOR CLASSIFICATION

3.1 Changes to the TC

HKAR 21.91 addresses all changes to any of the aspects of a TC. This includes changes to a type design, as defined in HKAR 21.31, as well as to the other constituents of a TC, as defined in HKAR 21.41.

3.2 Reserved.

3.3 Classification process (see also the flow chart 'Classification process' in Appendix A to GM to HKAR 21.91)

HKAR 21.91 requires all changes to be classified as either major or minor, using the criteria of HKAR 21.91. Wherever there is doubt as to the classification of a change, the Director-General should be consulted for clarification.

When the strict application of the paragraph 3.4 criteria results in a major classification, the applicant may request reclassification, if justified, and the Director-General could take the responsibility for reclassifying the change.

The reasons for a classification decision should be recorded.

3.4 Complementary guidance for classification of changes

A change to the TC is judged to have an 'appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, noise, fuel venting, exhaust emission, operational suitability or other characteristics affecting the airworthiness, environmental protection or operational suitability of the product' and, therefore, should be classified as major, in particular but not only, when one or more of the following conditions are met:

(a) Where the change requires an adjustment of the type certification basis or the OSD certification basis (special conditions or equivalent safety findings) other than elect to comply with later certification specifications;

(b) Where the applicant proposes a new interpretation of the certification specifications used for the type certification basis or the OSD certification basis that has not been published as AMC material or otherwise agreed with the Director-General;

(c) Where the demonstration of compliance uses methods that have not been previously accepted as appropriate for the nature of the change;

(d) Where the extent of new substantiation data necessary to comply with the applicable certification specifications and the degree to which the original substantiation data has to be re-assessed and re-evaluated is considerable;

(e) Where the change alters the airworthiness limitations or the operating limitations;

(f) Where the change is made mandatory by an airworthiness directive or the change is the terminating action of an airworthiness directive (ref. HKAR 21.3B); and

(g) Where the design change introduces or affects functions where the failure effect is classified as catastrophic or hazardous.

For an understanding of how to apply the above conditions, it is useful to take note of the examples given in Appendix A to GM to HKAR 21.91.

3.5 Complementary guidance on the classification of changes to OSD

Reserved.

3.6 Complementary guidance for the classification of changes to aircraft flight manuals (AFMs)

The following changes to the AFM are deemed to be minor:

(a) Revisions to the AFM associated with changes to the type design that are classified as minor in accordance with HKAR 21.91;

(b) Revisions to the AFM that are not associated with changes to the type design (also identified as stand-alone revisions) which fall into one of the following categories:

1 changes to limitations or procedures that remain within already certified limits (e.g. weight, structural data, noise, etc.);

2 consolidation of two or more previously approved and compatible AFMs into one, or the compilation of different parts taken from previously approved and compatible AFMs that are directly applicable to the individual aircraft (customisation); and

3 the introduction into a given AFM of compatible and previously approved AFM amendments, revisions, appendices or supplements;

(c) Administrative revisions to the AFM, defined as follows:

1 for the AFMs issued by the TC holder:

(i) editorial revisions or corrections to the AFM;

(ii) changes to parts of the AFM that do not require approval by the authority of the State of Design;

(iii) reserved;

(iv) the addition of aircraft serial numbers to an existing AFM where the aircraft configuration, as related to the AFM, is identical to the configuration of aircraft already covered by that AFM;

(v) the removal of references to aircraft serial numbers no longer applicable to that AFM; and

(vi) reserved.

2 for AFM supplements issued by STC holders:

(i) editorial revisions or corrections to the AFM supplement;

(ii) changes to parts of the AFM supplement that are not required to be approved by the authority of the State of Design;

(iii) reserved;

(iv) the addition of aircraft serial numbers to an existing AFM supplement where the aircraft configuration, as related to the AFM supplement, is identical to that of the aircraft already in that AFM supplement; 'identical' means here that all the aircraft have to belong to the same type and model/variant;

(v) the addition of a new STC to an existing AFM supplement, when this supplement is fully applicable to the new STC;

(vi) the removal of references to aircraft serial numbers that are no longer applicable to that AFM supplement; and

(vii) reserved.

3.7 Complementary guidance for classification of changes to environmental protection characteristics See Section 8 of Appendix A to GM to HKAR 21.91.

Appendix A to GM to HKAR 21.91 Examples of major changes per discipline

The information below is intended to provide a few major change examples per discipline, resulting from application of HKAR 21.91 and paragraph 3.3 conditions. It is not intended to present a comprehensive list of all major changes. Examples are categorised per discipline and are applicable to all products (aircraft, engines and propellers). However a particular change may involve more than one discipline, e.g., a change to engine controls may be covered in engines and systems (software).

Those involved with classification should always be aware of the interaction between disciplines and the consequences this will have when assessing the effects of a change (i.e., operations and structures, systems and structures, systems and systems, etc.; see example in paragraph (a) 2.

Specific rules may exist which override the guidance of these examples.

In HKAR-21 a negative definition is given of minor changes only. However in the following list of examples it was preferred to give examples of major changes.

Where in this list of examples the words 'has effect' or 'affect(s)' are used, they have always to be understood as being the opposite of 'no appreciable effect' as in the definition of minor change in HKAR 21.91. Strictly speaking the words 'has appreciable effect' and 'appreciably affect(s)' should have been used, but this has not been done to improve readability.

(a) Structure

1 Changes such as a cargo door cut-out, fuselage plugs, change of dihedral, addition of floats;

2 Changes to materials, processes or methods of manufacture of primary structural elements, such as spars, frames and critical parts;

3 Changes that adversely affect fatigue or damage tolerance or life limit characteristics; and

4 Changes that adversely affect aeroelastic characteristics.

(b) Cabin Safety

1 Changes which introduce a new cabin layout of sufficient change to require a re-assessment of emergency evacuation capability or which adversely affect other aspects of passenger or crew safety;

Items to consider include, but are not limited to:

- changes to or introduction of dynamically tested seats;
- change to the pitch between seat rows;
- change of distance between seat and adjacent obstacle like a divider;
- changes to cabin lay outs that affect evacuation path or access to exits;
- installation of new galleys, toilets, wardrobes, etc; and
- installation of new type of electrically powered galley insert; and

2 Changes to the pressurisation control system which adversely affect previously approved limitations.

(c) Flight

Changes which adversely affect the approved performance, such as high altitude operation, brake changes that affect braking performance.

Changes which adversely affect the flight envelope.

Changes which adversely affect the handling qualities of the product including changes to the flight controls function (gains adjustments, functional modification to software) or changes to the flight protection or warning system.

(d) Systems

For systems assessed under FAA FAR/EASA CS 25.1309, the classification process is based on the functional aspects of the change and its potential effects on safety.

1 Where failure effect is 'Catastrophic' or 'Hazardous', the change should be classified as major.

2 Where failure effect is 'major', the change should be classified as major if:

- aspects of the compliance demonstration use means that have not been previously accepted for the nature of the change to the system; or
- the change affects the pilot/system interface (displays, controls, approved procedures); or
- the change introduces new types of functions/systems such as GPS primary, TCAS, Predictive windshear, HUD.

The assessment of the criteria for software changes to systems also needs to be performed.

When software is involved, account should be taken also of the following guidelines:

Where a change is made to software produced in accordance with the guidelines of the latest edition of EASA AMC 20-115 (see EASA AMC-20 document) the change should be classified as major if either of the following apply, and the failure effect is Catastrophic, Hazardous or Major:

1 The executable code for software, determined to be Level A or Level B in accordance with the guidelines, is changed unless that change involves only a variation of a parameter value within a range already verified for the previous certification standard;

2 The software is upgraded to or downgraded from Level A, Level B or Level C; or

3 The executable code, determined to be level C, is deeply changed, e.g., after a software re-engineering process accompanying a change of processor.

For software developed to guidelines other than the latest edition of EASA AMC 20-115, the applicant should assess changes in accordance with the foregoing principles.

For other codes the principles noted above may be used. However, due consideration should be given to specific certification specifications/interpretations.

In the context of a product information security risk assessment (PISRA), a change that may introduce the potential for unauthorised electronic access to product systems should be considered to be 'major' if there is a need to mitigate the risks for an identified unsafe condition. The following examples do not provide a complete list of conditions to classify a modification as major, but rather they present the general interactions between security domains. Examples of modifications that should be classified as 'major' are when any of the following changes occur:

1 A new digital communication means, logical or physical, is established between a more closed, controlled information security domain, and a more open, less controlled security domain.

- For example, in the context of large aircraft, a communication means is established between the aircraft control domain (ACD) and the airline information services domain (AISD), or between the AISD and the passenger information and entertainment services domain (PIESD) (see ARINC 811).

  As an exception, new simplex digital communication means (e.g. ARINC 429) from a controlled domain to a more open domain is not considered as major modification, if it has been verified that the simplex control cannot be reversed by any known intentional unauthorised electronic interaction (IUEI).

2 A new service is introduced between a system of a more closed, controlled information security domain and a system of a more open, less controlled security domain, which allows the exploitation of a vulnerability of the service that has been introduced, creating a new attack path.

For example:

- opening and listening on a User Datagram Protocol (UDP) port in an end system of an already certified topology; and

- activating a protocol in a point-to-point communication channel.

3 The modification of a service between a system of a more closed, controlled security domain and a system of a more open, less controlled security domain.

4 The modification of a security control between a system of a more closed, controlled information security domain and a system of a more open, less controlled security domain.

(e) Propellers

Changes to:

1 diameter;

2 airfoil;

3 planform;

4 material; and

5 blade retention system, etc.

(f) Engines

Changes:

1 That adversely affect operating speeds, temperatures, and other limitations;

2 That affect or introduce parts identified by EASA CS E-510 where the failure effect has been shown to be hazardous;

3 That affect or introduce engine critical parts (EASA CS E-515) or their life limits;

4 To a structural part which requires a re-substantiation of the fatigue and static load determination used during certification;

5 To any part of the engine which adversely affects the existing containment capability of the structure;

6 That adversely affect the fuel, oil and air systems, which alter the method of operation, or require reinvestigation against the type certification basis; and

7 That introduce new materials or processes, particularly on critical components.

(g) Rotors and drive systems

Changes that:

1 Adversely affect fatigue evaluation unless the service life or inspection interval are unchanged. This includes changes to materials, processes or methods of manufacture of parts, such as:

- rotor blades;

- rotor hubs including dampers and controls;

- gears;

- drive shafts; or
- couplings.

2 Affect systems the failure of which may have hazardous or catastrophic effects. The design assessment will include:

- cooling system;
- lubrication system; and
- rotor controls.

3 Adversely affect the results of the rotor drive system endurance test, the rotor drive system being defined in EASA CS 27/29.917; and

4 Adversely affect the results of the shafting critical speed analysis required by EASA CS 27/29.931.

(h) Environment

The introductory text to Appendix A to GM to HKAR 21.91 describes how in HKAR-21 a negative definition is given of minor changes only. This philosophy is similar to the manner in which the ICAO Standards and Recommended Practices for environmental protection (ICAO Annex 16) and the associated Guidance Material (ICAO Environmental Technical Manual) define changes affecting a product's environmental characteristics in terms of 'no-acoustical changes', 'no-emissions changes' and 'no-CO2 changes' (i.e. changes which do not appreciably affect the product's environmental characteristics).

Following the general philosophy of this Appendix, however, it is preferred to give examples of changes which might have an appreciable effect on a product's environmental characteristics (i.e. the effect might be greater than the no-acoustic change, no-emissions change and no-CO2 change criteria) and might therefore lead to a 'major change' classification.

Where a change is made to an aircraft or aircraft engine, the effect of the change on the product's environmental characteristics should be taken into account. Examples of changes that might have an appreciable effect on the product's environmental characteristics, and might therefore be classified as major changes, are listed below. The examples are not exhaustive and will not, in every case, result in an appreciable change to the product's environmental characteristics, and therefore, will not per se and in every case result in a 'major change' classification.

An appreciable effect is considered to be one which exceeds the ICAO criteria for a no-acoustical change, a no-emissions change or a no-CO2 change. For the definition of a no-acoustical change refer to the section of the ICAO Environmental Technical Manual, Volume I (ICAO Doc 9501, Volume I – Procedures for the Noise Certification of Aircraft) concerning changes to aircraft type designs involving no-acoustical changes (see also the definitions of a 'derived version' in ICAO Annex 16, Volume I). For the definition of a no-emissions change, refer to the section of the ICAO Environmental Technical Manual, Volume II (ICAO Doc 9501, Volume II – Procedures for the Emissions Certification of Aircraft Engines) concerning no-emissions changes. For the definition of a no-CO2 change, refer to ICAO Doc 9501 'Environmental Technical Manual', Volume III 'Procedures for the CO2 Emissions Certification of Aeroplanes', 1st Edition 2018, concerning no-CO2 changes.

1 Noise: A change that introduces either:

- an increase in the noise certification level(s); or
- a reduction in the noise certification level(s) for which the applicant wishes to take credit.

Examples of noise-related changes that might lead to a major change classification are:

(i) For jet and heavy (maximum take-off mass greater than 8618 kg) propeller-driven aeroplanes:

- A change that might affect the aircraft's take-off performance including:
  - a change to the maximum take-off mass;
  - a change to V2 ('take-off safety speed'); or
  - a change to the lift augmentation devices, including their configuration under normal take-off operating conditions.
- A change that might affect the aircraft's landing performance including:
  - a change to the maximum landing mass;
  - a change to VREF (reference landing speed); or
  - a change to the lift augmentation devices, including their deployment under normal landing operating conditions.

- A change to the Centre of Gravity (CG) limits;
- A change that increases the aircraft's drag;
- A change that alters the external profile of the aircraft, including the installation or change of shape or size of any item on the external surface of the aircraft that might protrude into the airflow such as winglets and vortex generators; generally the installation of small antennas does not represent an acoustical change;
- A change that introduces an open-ended hollow cavity at more or less right angles to the airflow (e.g. hollow pins in undercarriage assemblies);
- A change of engine or, if fitted, propeller type;
- A change in engine thrust rating;
- A change to the engine rotating parts or stators, such as geometry, blade profile or blade number;
- A change to the aerodynamic flow lines through the engine;
- A change that affects the engine thermodynamic cycle, including a change to the engine's bypass ratio;
- A change to the engine nacelle, including a change to the acoustic liners;
- A change to the engine exhaust;
- A change to the engine bleed valves, including bleed valve scheduling;
- A change in the operation of engine power off-takes (e.g. the operation of the Environmental Control System (ECS) during a normal take-off or approach);
- A change to the Auxiliary Power Unit (APU), including associated operating limitations (e.g. a change that allows the APU to be operated during a normal approach when previously it was not allowed);
- A change to the propeller pitch and/or propeller speed during a normal take-off or approach; and

- A change that causes a change to the angle at which air flows into the propeller.

(ii) For light (maximum take-off mass 8 618 kg or less) propeller-driven aeroplanes:

- A change that might affect the aircraft's take-off performance including:
  - a change to the maximum take-off mass;
  - a change to the take-off distance;
  - a change to the rate of climb; or
  - a change to Vy (best rate of climb speed).
- A change that increases the aircraft's drag (e.g. the installation of external cargo pods, external fuel tanks, larger tyres to a fixed undercarriage, floats etc.);
- A change of engine or propeller type;
- A change in take-off power including a change in engine speed (tachometer 'red line') or, for piston engines, a change to the manifold pressure limitations;
- A change to the highest power in the normal operating range ('top of green arc');
- In the case of an aircraft where take-off power/engine speed is time limited, a change in the period over which take-off power/engine speed may be applied;
- A change to the engine inlet or exhaust including, if fitted, the inlet or exhaust muffler;
- A change in propeller diameter, tip shape, blade thickness or the number of blades;
- The installation of a variable or adjustable pitch propeller in place of a fixed pitch propeller and vice versa; and
- A change that causes a change to the angle at which air flows into the propeller.

(iii) For helicopters:

- A change that might affect the take-off and/or landing performance, including a change in take-off mass and VY (best rate of climb speed);
- A change to VNE (never-exceed airspeed) or to VH (airspeed in level flight obtained using the torque corresponding to minimum engine installed, maximum continuous power available for sea level pressure, 25°C ambient conditions at the relevant maximum certificated mass);
- A change to the maximum take-off engine power or maximum continuous power;
- A change to the gearbox torque limits;
- A change of engine type;
- A change to the engine intake or exhaust;
- A change to the maximum normal operating rpm of the main or tail rotors; and
- A change to the main or tail rotors, including a change in diameter, blade thickness or blade tip profile.

Note: The effect on the helicopter's noise characteristics of either carrying external loads or the installation of external equipment need not be considered.

2 Emissions: A change that introduces an increase or decrease in the emissions certification levels. Examples of smoke and gaseous engine emission-related changes that might lead to a major change classification are:

- A change in engine thrust rating;
- A change to the aerodynamic flow lines through the engine;
- A change that affects the engine thermodynamic cycle, specifically relevant engine cycle parameters (e.g. combustor pressure P3, combustor entry temperature T3, Air Fuel Ratio (AFR));
- A change to the compressor that might influence the combustor inlet conditions and engine overall pressure ratio;

- A change to the combustor design (geometry);
- A change to the cooling of the combustor;
- A change to the air mass flow through the combustor; and
- A change that affects the fuel spray characteristics.

3 CO_2: a change that introduces either:

- An increase in the CO2 emissions certification level; or
- A decrease in the CO2 emissions certification level for which an applicant wishes to take credit.

Examples of CO_2 emission-related changes that may lead to a 'major change' classification are:

- A change to the maximum take-off mass;
- A change that may affect the aeroplane's specific air range performance, including one or several of the following:
  - a change that increases the aircraft's drag;
  - a change of engine or, if fitted, propeller type; or
  - a change in the engine design that affects the engine specific fuel consumption in cruise; and
- A change to the aeroplane's reference geometric factor (RGF).

(i) Power plant Installation

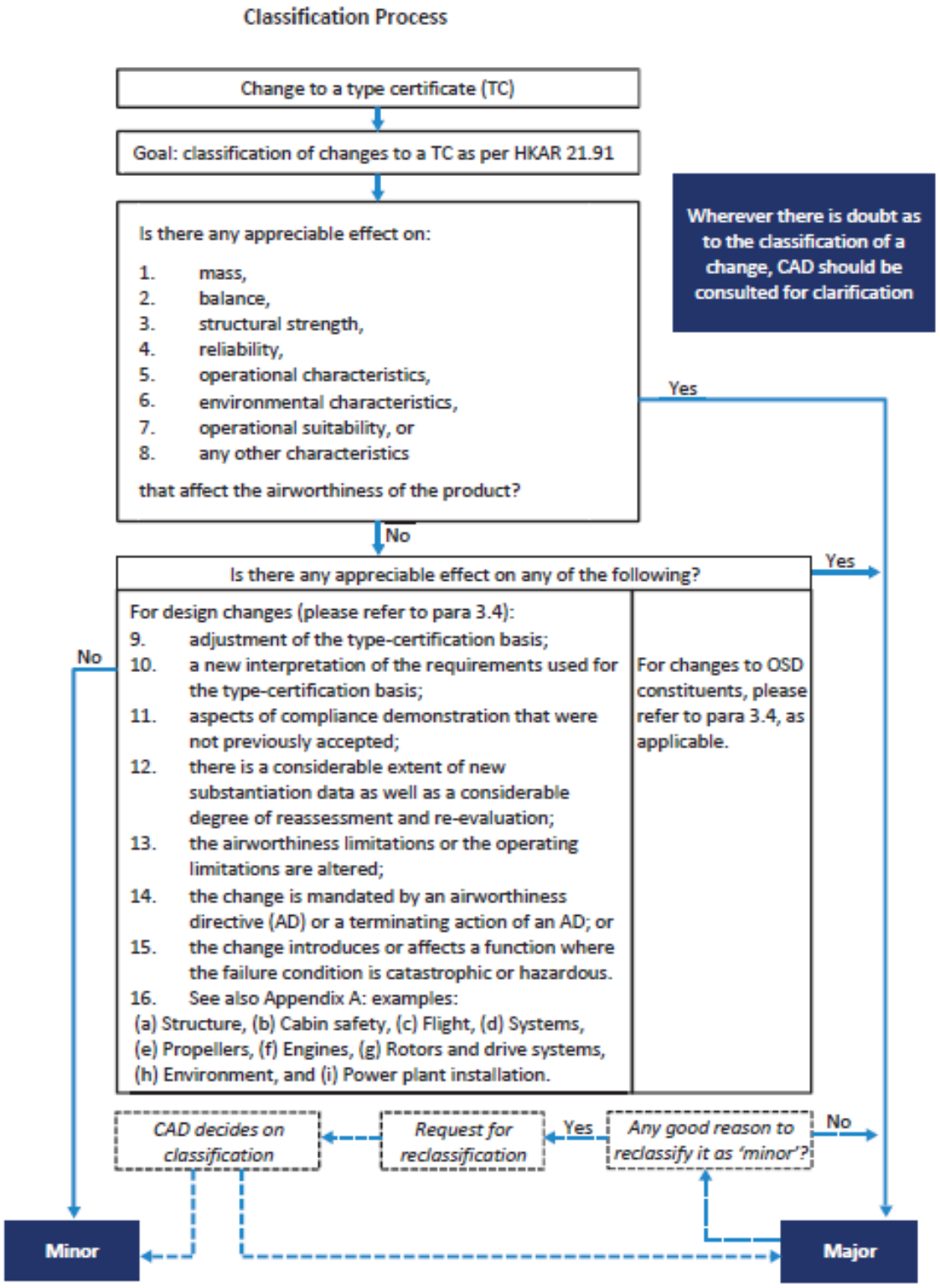
Changes which include:

1 Control system changes which affect the engine/propeller/airframe interface;

2 New instrumentation displaying operating limits;

3 Modifications to the fuel system and tanks (number, size and configuration); and

4 Change of engine/propeller type.


Classification Process
Change to a type certificate (TC)
Goal: classification of changes to a TC as per HKAR 21.91
Is there any appreciable effect on:
1. mass,
2. balance,
3. structural strength,
4. reliability,
5. operational characteristics,
6. environmental characteristics,
7. operational suitability, or
8. any other characteristics
that affect the airworthiness of the product?
Wherever there is doubt as to the classification of a change, CAD should be consulted for clarification
Yes
No
Is there any appreciable effect on any of the following?
Yes
No
For design changes (please refer to para 3.4):
9. adjustment of the type-certification basis;
10. a new interpretation of the requirements used for the type-certification basis;
11. aspects of compliance demonstration that were not previously accepted;
12. there is a considerable extent of new substantiation data as well as a considerable degree of reassessment and re-evaluation;
13. the airworthiness limitations or the operating limitations are altered;
14. the change is mandated by an airworthiness directive (AD) or a terminating action of an AD; or
15. the change introduces or affects a function where the failure condition is catastrophic or hazardous.
16. See also Appendix A: examples:
(a) Structure, (b) Cabin safety, (c) Flight, (d) Systems, (e) Propellers, (f) Engines, (g) Rotors and drive systems, (h) Environment, and (i) Power plant installation.
For changes to OSD constituents, please refer to para 3.4, as applicable.
Any good reason to reclassify it as 'minor'?
Yes
No
Request for reclassification
CAD decides on classification
Minor
Major

HKAR 21.92 Eligibility

(a) Only the type certificate holder may apply for approval of a major change to a type certificate under this Subpart; all other applicants for a major change to a type certificate shall apply under Subpart E.

(b) Any natural or legal person, who have sound knowledge of the design principles embodied in the aircraft type being modified, may apply for approval of a minor change to a type certificate under this Subpart.

HKAR 21.93 Application

(a) An application for approval of a change to a type certificate shall be made in a form and manner established by the Director-General.

(b) An application shall include, or be supplemented after the initial application, a certification programme for the demonstration of compliance in accordance with HKAR 21.20, consisting of:

1 A description of the change identifying:

(i) the configuration(s) of the product in the type certificate upon which the change is to be made;

(ii) all areas of the product in the type certificate, including the approved manuals, that are changed or affected by the change; and

(iii) when the change affects the operational suitability data, any necessary changes to the operational suitability data;

2 Identification of any re-investigations necessary to demonstrate compliance of the changes and areas affected by the change with the type certification basis, operational suitability data certification basis and environmental protection requirements.

3 For major change to a type certificate:

(i) a proposal for the initial type certification basis, operational suitability data certification basis and environmental protection requirements, prepared in accordance with the requirements and options specified in HKAR 21.101;

(ii) a proposal for a breakdown of the certification programme into meaningful groups of compliance demonstration activities and data, including a proposal for the means of compliance and related compliance documents;

(iii) a proposal for the assessment of the meaningful groups of compliance demonstration activities and data, addressing the likelihood of an unidentified non-compliance with the type certification basis, operational suitability data certification basis or environmental protection requirements and the potential impact of that non-compliance on product safety or environmental protection. The proposed assessment shall take into account at least the elements set out in subpoints 1–4 as follow:

1. novel or unusual features of the certification project, including operational, organisational and knowledge management aspects;
2. complexity of the design and/or demonstration of compliance;
3. criticality of the design or technology and the related safety and environmental risks, including those identified on similar designs; and
4. performance and experience of the design organisation of the applicant in the domain concerned

(iv) based on this assessment, the application shall include a proposal for the Director General's involvement in the verification of the compliance demonstration activities and data; and

(v) a project schedule including major milestones.

(c) An application for a change to a type certificate of a large aeroplane or a large rotorcraft shall be valid for five years and an application for a change to any other type certificate shall be valid for three years. In the case where the change has not been approved, or it is evident that it will not be approved, within the time limit provided for in this point, the applicant may:

1 submit a new application for a change to the type certificate and comply with the type certification basis, operational suitability data certification basis and environmental protection requirements, as established by the Director-General in accordance with HKAR 21.101 and notified in accordance with HKAR 21.105 for the date of the new application; or

2 apply for an extension of the time period provided for in the first sentence of point (c) for the original application and propose a new date for the issuance of the approval. In that case, the applicant shall comply with the type certification basis, operational suitability data certification basis and environmental protection requirements, as established by the Director-General in accordance with HKAR 21.101 and notified in accordance with HKAR 21.105, for a date to be selected by the applicant. However, that date shall not precede the new date proposed by the applicant for the issuance of the approval by more than five years for an application for a change to type certificate or restricted type certificate for a large aeroplane or a large rotorcraft, and by more than three

years for an application for any other change to type certificate or restricted type certificate.

AMC to HKAR 21.93(a) Form and manner

The applicant should file application using application forms 'Application for Approval of Minor Change/Minor Repair Design' DCA 536 (CAD Form 32) for the approval of minor change and "Application for Approval of Major Repair Design' DCA 535 (CAD Form 31) for the approval of major repair. The forms are available from the CAD website.

The form should be completed in accordance with the instructions of the application form.

AMC to HKAR 21.93(b) Certification programme for a change to a TC or a STC

The description of the change should include an explanation of the purpose of the change, the pre-modification and post-modification configuration(s) of the product, schematics/pictures, and any other detailed features and boundaries of the physical change (this may be supplemented by drawings or outlines of the design, if this helps to understand the design change), as well as the identification of the changes in areas of the product that are functionally affected by the change, and the identification of any changes to the approved manuals. Guidance on areas that are changed and affected by the change is found in GM 21.101.

Identification of reinvestigations referred to in HKAR 21.93(b)2, necessary to demonstrate compliance, does not mean the demonstration of compliance itself, but the list of affected items of the applicable certification basis for which a new demonstration is necessary, together with the means (e.g. calculation, test or analysis) by which it is proposed to demonstrate compliance.

Before submitting the application for a change, the analysis and classification activities of HKAR 21.91 and HKA 21.101 should be performed using the corresponding GM. For repair designs, the analysis of HKAR 21.91 should be performed using GM to HKAR 21.435(a).

For a major change, AMC to HKAR 21.15(b) should be used as applicable to the change.

GM No. 1 to HKAR 21.93(b)1(iii) Reserved

GM No. 2 to 21.93(b)1(iii) Interaction of changes to the type design and changes to the master minimum equipment list (MMEL)

In general, it has to be assumed that changes to the type certificate (TC) that affect the type design can have an effect on the MMEL.

Due to its alleviating nature, the MMEL is developed to improve aircraft use, thereby providing a more convenient and economical air transportation for the public.

Therefore, not introducing MMEL relief for new equipment, system or function has no effect on the safety of the operation. The introduction of MMEL relief for new equipment can, therefore, be treated as a stand-alone MMEL change, separately from the design change, and can be processed at a later date than the date of entry into service of the aircraft including the design change.

Not modifying an MMEL item whose validity is altered by a type design modification may, however, have an effect on the safety of the operation. The applicant for a change to the TC that changes the type design should, therefore, identify whether this change needs to be supplemented by a change to the MMEL. However, the update of an MMEL relief for an already addressed equipment, system or function can be treated at a later date than the date of entry into service of the aircraft including the design change, provided that the change to the MMEL is of an alleviating nature. When the change to the MMEL is not of an alleviating nature, it has to be approved according to HKAR 21.97(b)2 and (c).

It may be assumed that a change to the type design requires a change to the MMEL if any of the following conditions are fulfilled:

(a) The change affects an existing MMEL item in a more restrictive manner: there is a change to equipment, system or function linked to an MMEL item, or a change to the operational limitations and procedures linked to an MMEL item;

(b) The change invalidates the assumptions used to justify an existing MMEL item, and requires a more restrictive MMEL item; and

(c) The change invalidates any dispatch conditions of the MMEL.

Examples of the above three conditions, where no change to the MMEL is required:

(a) Introduction of new equipment, system or function in the type design;

(b) The change has no adverse impact on the qualitative and quantitative assessment used to justify an MMEL item; and

(c) The dispatch conditions do not need to be more restrictive if the current intent of (o) or (m) procedures is not impacted.

The following diagram summarises the interaction between type design changes and changes to MMEL (see Figure 1).

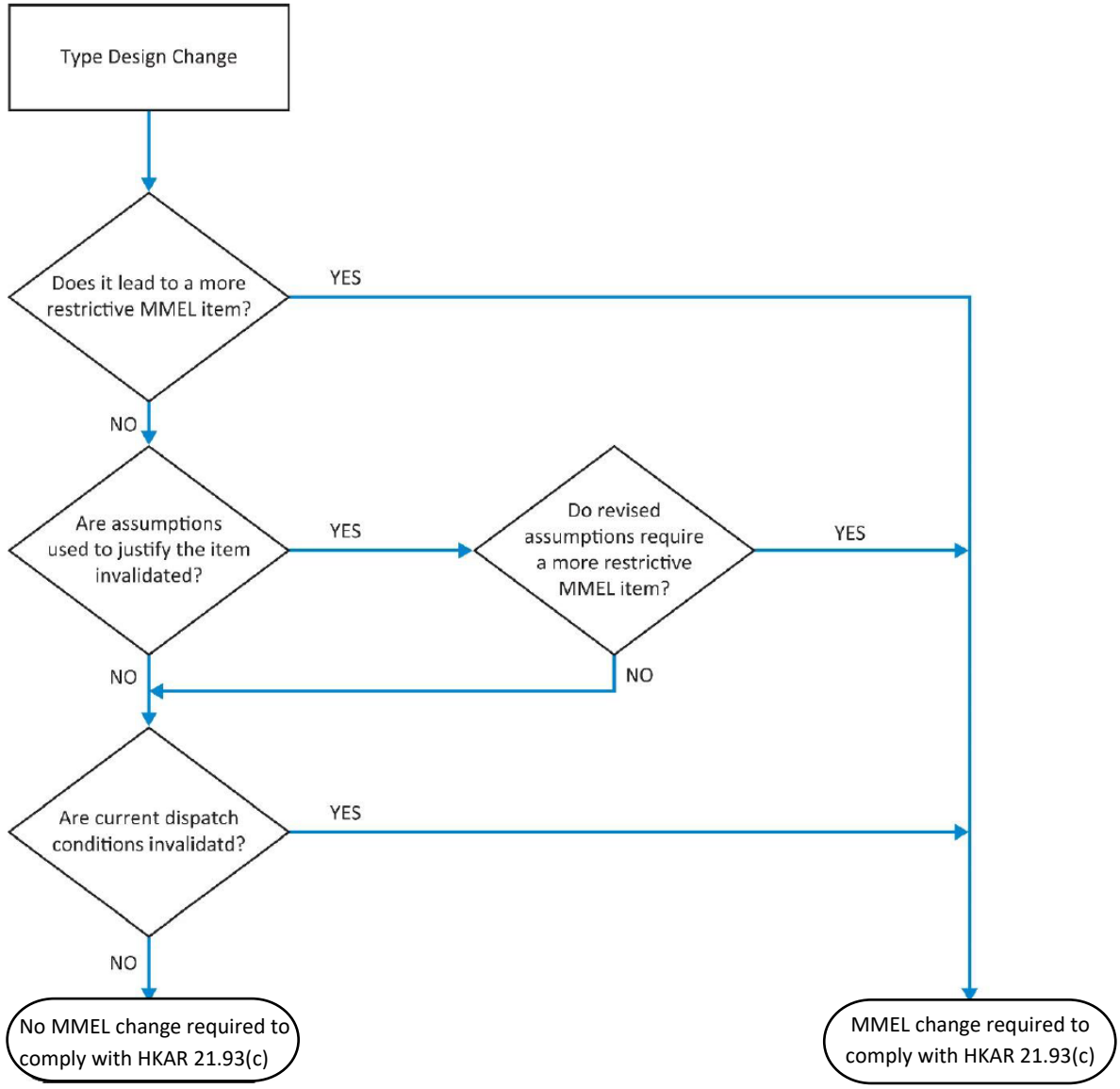


Figure 1

GM to HKAR 21.93(c) Period of validity of the application

For guidance on the determination of the period of validity for the application, refer to HKAR 21.15(e) and (f).

HKAR 21.95 Requirements for the approval of a minor change

(a) Minor changes to a type certificate shall be classified and approved by:

1 the Director-General; or

2 an approved design organisation within the scope of its privileges provided for in points 1 and 2 of HKAR 21.263(c), as recorded in the CAD Form Three.

(b) A minor change to a type certificate shall only be approved:

1 when it has been demonstrated that the change and areas affected by the change comply with the type certification basis and the environmental protection requirements incorporated by reference in the type certificate;

2 in the case of a change affecting the operational suitability data, when it has been demonstrated that the necessary changes to the operational suitability data comply with the operational suitability data certification basis incorporated by reference in the type certificate;

3 when compliance with the type certification basis that applies in accordance with point 1 has been declared and the justifications of compliance have been recorded in the compliance documents; and

4 when no feature or characteristic has been identified that may make the product unsafe for the uses for which certification is requested.

(c) By derogation from (b)1, certification specifications which became applicable after those incorporated by reference in the type certificate can be used for approval of a minor change, provided they do not affect the demonstration of compliance.

(d) By derogation from (a), at the applicant's request included in the declaration referred to in HKAR 21.20(d), a minor change to an aircraft type certificate may be approved before compliance with the operational suitability data certification basis has been demonstrated, provided that the applicant demonstrates such compliance before the date at which those data are actually used.

(e) The applicant shall submit to the Director-General the substantiation data for the change and a statement that compliance has been demonstrated in accordance with (b).

(f) An approval of a minor change to a type certificate shall be limited to the specific configuration(s) in the type certificate to which the change relates.

AMC to HKAR 21.95 Requirements for the approval of a minor change

(a) Applicability of HKAR 21.95

HKAR 21.95 has to be complied with by applicants for the approval of a minor change to a type certificate (TC), and by design organisation approval (DOA) holders that approve minor changes under their own privileges.

HKAR 21.95(e), however, only applies to projects for which an application is submitted to the Director-General. For DOA holders that approve minor changes under their privileges, the substantiating data and the statement of compliance required by HKAR 21.95(e) should be produced but do not need to be submitted to the Director-General. They should be, however, kept on record and submitted to the Director-General on request during its DOA continued surveillance process.

(b) The approval process

The approval process comprises the following steps:

Note: Steps 1, 2 and 5 should be followed only by applicants for minor changes approved by the Director-General. DOA holders that approve minor changes under their privileges should refer to AMC No. 1 to HKAR 21.263(c)2 as applicable to their approval process.

1 Application

When the minor change is approved by the Director-General, an application should be submitted to the Director-General as described in HKAR 21.93(a) and (b) and in AMC to HKAR 21.93(a).

2 Certification programme

The certification programme should consist of the information defined in HKAR 21.93(b)1 and HKAR 21.93(b)2. Please refer to AMC to HKAR 21.93(b) for further information.

3 Certification basis

4 Demonstration of compliance

5 Statement of compliance

(c) Certification basis

The certification basis for a minor change consists of a subset of the elements of the product's certification basis 'incorporated by reference in the type certificate' (see also the additional guidance below on the meaning of certification specifications that became applicable after those 'incorporated by reference in the type certificate'), which have been identified in accordance with HKAR 21.93(b)2 due to a reinvestigation of compliance being necessary because compliance was affected by the minor change (see also additional guidance below on the meaning of 'specific configurations'). The certification basis 'incorporated by reference in the type certificate' is the certification basis for the product as recorded in the type certificate data sheet (TCDS) for the product type/model in the configuration(s) identified in accordance with HKAR 21.93(b)1(i).

(d) Demonstration of compliance required by HKAR 21.95(b)1 and 2

The applicant needs to demonstrate compliance with the certification basis established for the minor change for all areas that are either physically changed or functionally affected by the minor change.

1 Means of compliance: the applicant should define and record the means (calculation, test or analysis, etc.) by which compliance is demonstrated. Appendix A to AMC to HKAR 21.15(b) may be used to describe how compliance is demonstrated.

2 Compliance documents: the compliance demonstration should be recorded in compliance documents. For minor changes, one comprehensive compliance document may be sufficient, provided that it contains evidence of all aspects of the compliance demonstration. AMC to HKAR 21.20(c) can also be used, where applicable. See also the additional guidance in item (e).

3 Aircraft manuals: where applicable, supplements to manuals (e.g. aircraft flight manual (AFM), aircraft maintenance manual (AMM), etc.) may be issued. See also additional guidance below on embodiment/installation instructions (item (f)).

(e) Definition of the change to the type certificate

The change to the type certificate should be defined in accordance with GM No. 2 to HKAR 21.90A.

(f) Embodiment/installation instructions

The instructions for the embodiment/installation of the change (e.g. service bulletin, modification bulletin, production work order, etc.) should be defined. This may include the installation procedure, the required material, etc.

(g) Minor changes affecting OSD constituents (i.e. master minimum equipment list (MMEL)) Some minor changes to the type design may only have an effect on the MMEL. In such cases, GM No. 2 to HKAR 21.93(b)1(iii) is applicable.

(h) Meaning of 'specific configurations' in HKAR 21.95(f)

These 'specific configurations' are defined as the combination of the product type/model (on which the minor change will be installed) with (if applicable) the list of those already approved changes (minor, major, supplemental type certificate (STC)) that are required for the installation of the minor change.

(i) Certification specifications that became applicable after those incorporated by reference in the type certificate

1 Minor changes are those changes that do not affect the airworthiness of the product and thus are, by definition, non-significant as per HKAR 21.101. This means that the certification basis for the minor change may consist of the items of the certification basis incorporated by reference in the TCDS of the product type/model, and normally it should not be necessary for a minor change to use certification specifications that became applicable after those that are incorporated by reference in the type certificate.

2 On the other hand, the applicant may elect to use later amendments of the affected certification specifications for the compliance demonstration. This does not affect the classification of the change; however, the applicant should also comply with any other certification specifications that the Director-General considers to be directly related.

3 If other changes are required for the installation of the minor change (as explained in 'specific configurations'), the certification basis for the minor change should also take into account the corresponding certification basis.

(j) Meaning of 'no feature or characteristics' in HKAR 21.95(b)4

Refer to GM to HKAR 21.20(d).

GM to HKAR 21.95(b) Requirements for the approval of a minor change

The level of detail of the documents that are referred to in HKAR 21.93(b) should be the same regardless of whether the change is approved by the Director-General or under a design organisation approval (DOA) privilege, to allow the change to be assessed in the frame of the DOA surveillance.

HKAR 21.97 Requirements for the approval of a major change

(a) Major changes to a type certificate shall be classified and approved by:

1 the Director-General; or

2 an approved design organisation within the scope of its privileges provided for in points 1 and 8 of HKAR 21.263(c), as recorded in the CAD Form Three.

(b) A major change to a type certificate shall only be approved:

1 when it has been demonstrated that the change and areas affected by the change comply with the type certification basis and the environmental protection requirements, as established by the Director-General in accordance with HKAR 21.101;

2 in the case of a change affecting the operational suitability data, when it has been demonstrated that the necessary changes to the operational suitability data comply with the operational suitability data certification basis, if established by the Director-General in accordance with HKAR 21.101; and

3 when compliance with points 1 and 2 has been demonstrated in accordance with HKAR 21.20, as applicable to the change.

(c) By derogation from point 2 and 3 of point (b), at the applicant's request included in the declaration referred to in HKAR 21.20(d), a major change to an aircraft type certificate may be approved before compliance with the operational suitability data certification basis has been demonstrated, provided that the applicant demonstrates such compliance before the date at which those data are actually used.

(d) An approval of a major change to a type certificate shall be limited to the specific configuration(s) in the type certificate to which the change relates.

HKAR 21.101 Type certification basis, operational suitability data certification basis and environmental protection requirements for a major change to a type certificate

(a) A major change to a type certificate and the areas affected by the change shall comply with either the certification specifications applicable to the changed product on the date of the application for the change or the certification specifications which became applicable after that date in accordance with point (f) below. The validity of the application shall be determined in accordance with HKAR 21.93(c). In addition, the

changed product shall comply with the applicable environmental protection requirements laid down in HKAR 21.18.

(b) By derogation from paragraph (a), an applicant may show that the changed product complies with an earlier amendment of the certification specifications referred to in paragraph (a), and of any other certification specification the Director-General finds is directly related. However, the earlier amended certification specifications may not precede the corresponding certification specifications incorporated by reference in the type certificate. The applicant may show compliance with an earlier amendment of a certification specifications for any of the following:

1 A change that the Director-General finds not to be significant. In determining whether a specific change is significant, the Director-General considers the change in context with all previous relevant design changes and all related revisions to the applicable certification specifications incorporated in the type certificate for the product. Changes that meet one of the following criteria are automatically considered significant:The general configuration or the principles of construction are not retained.

(ii) The assumptions used for certification of the product to be changed do not remain valid.

2 Each area, system, part or appliance that the Director-General finds is not affected by the change.

3 Each area, system, part or appliance that is affected by the change, for which the Director-General finds that compliance with the certification specifications referred to in paragraph (a) would not contribute materially to the level of safety of the changed product or would be impractical.

(c) By derogation from point (a), in the case of a change to an aircraft other than a rotorcraft of 2,722 kg (6,000 lb) or less maximum weight, or to a non-turbine rotorcraft of 1,361 kg (3,000 lb) or less maximum weight, the changes and areas affected by the change shall comply with the type certification basis incorporated by reference in the type certificate. However, if the Director-General finds that the change is significant in an area, the Director-General may require that the change and areas affected by the change comply with an amendment to a certification specification of the type certification basis incorporated by reference in the type certificate and with other certification specification which is directly related, unless the Director-General also finds that compliance with that amendment does not contribute materially to the level of safety of the changed product or is impractical.

(d) If the Director-General finds that the certification specifications applicable on the date of the application for the change do not provide adequate standards with respect to the proposed change, the change and areas affected by the change shall also comply with any special conditions, and amendments to those special conditions, prescribed under the provisions of HKAR 21.16B, to provide a level of safety equivalent to that established by the certification specifications applicable on the date of the application for the change.

(e) By derogation from points (a), (b) and (c), the change and areas affected by the change may comply with an alternative to a certification specification designated by the Director-General if proposed by the applicant, provided that the Director-General finds that the alternative provides a level of safety which is:

1 in the case of a type certificate:

(i) equivalent to that of the certification specifications designated by the Director-General under (a), (b) or (c) above; or

(ii) reserved.

(f) If an applicant chooses to comply with a certification specification set out in an amendment that becomes applicable after submitting the application for a change to a type certificate, the change and areas affected by the change shall also comply with any other certification specifications which is directly related.

(g) When the application for a change to a type certificate for an aircraft includes, or is supplemented after the initial application to include, changes to the operational suitability data, the operational suitability data certification basis shall be established in accordance with points (a) to (f).

GM to HKAR 21.101 Establishing the certification basis of changed aeronautical products

Refer to EASA GM 21.A.101 as applicable.

Appendix A to GM to HKAR 21.101 Classification of design changes

Refer to EASA Appendix A to GM 21.A.101 as applicable.

Appendix B to GM to HKAR 21.101 Application charts for changed product rule

Refer to EASA Appendix B to GM 21.A.101 as applicable.

Appendix C to GM to HKAR 21.101 A method to determine the changed and affected areas

Refer to EASA Appendix C to GM 21.A.101 as applicable.

Appendix D to GM to HKAR 21.101 Other guidance for affected areas

Refer to EASA Appendix D to GM 21.A.101 as applicable.

Appendix E to GM to HKAR 21.101 Procedure for evaluating material contribution to safety or impracticality of applying latest certification specifications to a changed product

Refer to EASA Appendix E to GM 21.A.101 as applicable.

Appendix F to GM to HKAR 21.101 The use of service experience in the exception process

Refer to EASA Appendix F to GM 21.A.101 as applicable.

GM No. 1 to HKAR 21.101(g) Reserved

HKAR 21.105 Record keeping

For each change, all relevant design information, drawings and test reports, including inspection records for the changed product tested, shall be held by the applicant at the disposal of the Director-General and shall be retained in order to provide the information necessary to ensure the continued airworthiness, continued validity of the operational suitability data and compliance with applicable environmental protection requirements of the changed product.

HKAR 21.107 Instructions for continued airworthiness

(a) The holder of a minor change approval to type certificate shall furnish at least one set of the associated variations, if any, to the instructions for continued airworthiness of the product on which the minor change is to be installed, prepared in accordance with the applicable type certification basis, to each known owner of one or more aircraft, engine, or propeller incorporating the minor change, upon its delivery, or upon issuance of the first certificate of airworthiness for the affected aircraft, whichever

occurs later, and thereafter make those variations in instructions available, on request, to any other person required to comply with any of the terms of those instructions.

(b) In addition, changes to those variations of the instructions for continued airworthiness shall be made available to all known operators of a product incorporating the minor change and shall be made available, on request, to any person required to comply with any of those instructions.

HKAR 21.108 Availability of operational suitability data

In the case of a change affecting the operational suitability data, the holder of the minor change approval shall make available:

(a) At least one set of changes to the operational suitability data prepared in accordance with the applicable operational suitability certification basis, to all known operators of the changed aircraft, before the operational suitability data must be used by a training organisation or operator; and

(b) Any further change to the affected operational suitability data, to all known operators of the changed aircraft; and

(c) On request, the relevant parts of the changes in points (a) and (b) above, to:

1 the Director-General responsible for verifying conformity with one or more elements of the affected operational suitability data; and

2 any person required to comply with one or more elements of this set of operational suitability data.

HKAR 21.109 Obligations and Hong Kong Part Approval (HPA) marking

The holder of a minor change approval to type design shall:

(a) Undertake the obligations laid down in HKAR 21.4, HKAR 21.105, HKAR 21.107 and HKAR 21.108; and

(b) Specify the marking, including HPA letters, in accordance with HKAR 21.804(a)

SUBPART E SUPPLEMENTAL TYPE CERTIFICATES

HKAR 21.111 Scope

This Subpart establishes the procedure for the approval of major changes to the type certificate under supplemental type certificate procedures, and establishes the rights and obligations of the applicants for, and holders of, those certificates.

AMC to HKAR 21.111 Scope

A supplement type certificate issued by the other civil aviation authorities may be accepted or validated by the Director-General.

GM to HKAR 21.111 Scope

Refer to the Cooperation Arrangement or Working Procedures/Arrangement between CAD and the respective authority in regards to the acceptance / validation of design changes. The 'Arrangements' established with other civil aviation authorities are published in the Hong Kong Civil Aviation Department website.

HKAR 21.112A Eligibility

Any natural or legal person ('organisation') that has demonstrated, or is in the process of demonstrating, its capability under HKAR 21.112B shall be eligible as an applicant for a supplemental type certificate under the conditions laid down in this Subpart.

HKAR 21.112B Demonstration of capability

(a) Any organisation applying for a supplemental type certificate shall demonstrate its capability by holding a design organisation approval, issued by the Director-General in accordance with Subpart J.

(b) Reserved.

(c) Reserved.

AMC to HKAR 21.112B Demonstration of capability

The demonstration of capability is not required if the applicant is the supplemental type certificate holder applying for validation of its original supplemental type certificate.

HKAR 21.113 Application for a supplemental type certificate

(a) An application for a supplemental type certificate shall be made in a form and manner established by the Director-General.

(b) When applying for a supplemental type certificate, the applicant shall:

1 include in the application the information required by HKAR 21.93(b); and

2 specify whether the certification data has been or will be prepared completely by the applicant or on the basis of an arrangement with the owner of the type certification data.

(c) HKAR 21.93(c) applies to the requirements for the time limits of the application effectivity as well as the requirements related to the need to update the type certification basis, operational suitability data certification basis and environmental protection requirements, when the change has not been approved or it is evident that it will not be approved within the time limit established.

AMC to HKAR 21.113(a) Form and manner

The applicant should file an application using:

(a) CAD Form 33 (DCA 534) for a supplemental type certificate (STC); or

(b) CAD Form 33A (DCA 539) for validation of a supplemental type certificate (STC).

The form can be downloaded from the HKCAD website.

The form should be completed and sent to HKCAD in accordance with the instructions from the application form.

GM to HKAR 21.113(b) Application for validation of supplemental type certificate

(a) Applicants are encouraged to discuss any proposed supplemental type certificate with the Director-General at the earliest opportunity.

(b) The application should be accompanied by a letter that includes a description of the project, the type of product involved, where the design and installation will be conducted, and a schedule for completion of the project.

(c) An application for validation of an STC not issued by the Director-General should be submitted via the issuing authority of the STC.

(d) The application for VSTC should be supported with following data:

1 a duly completed 'Application for Validation of Supplemental Type certificate VSTC' form CAD Form 33A;

2 a copy of the Companies Register;

3 confirmation of deposit for the application fee;

4 a copy of the STC to be validated, as applicable;

5 a copy of all data/documents referenced on the STC (MDL, FMS, ICA, IPC, etc);

6 a copy of the Compliance Summary Document (PSCP & compliance summary document); and

7 a copy of all Certification Review Items (CRI) or Issue Papers (IP) which may document/apply the certification basis, special conditions, equivalent safety findings, acceptable means of compliance or interpretative materials.

HKAR 21.115 Requirements for the approval of major changes in the form of a supplemental type certificate

(a) Supplemental type certificates shall be issued by the Director-General.

(b) A supplemental type certificates shall only be issued when:

1 the applicant has demonstrated its capability in accordance with HKAR 21.112B;

2 it has been demonstrated that the change to a type certificate and areas affected by the change comply with the type certification basis and the environmental protection requirements, as established by the Director-General in accordance HKAR 21.101;

3 in the case of a supplemental type certificate affecting the operational suitability data, it has been demonstrated that the necessary changes to the operational suitability data meet the operational suitability data certification basis, if established by the Director-General in accordance with HKAR 21.101;

4 compliance with points 2 and 3 has been demonstrated in accordance with HKAR 21.20, as applicable to the change; and

5 in case the applicant has specified that it provided certification data on the basis of an arrangement with the owner of the type certification data in accordance with HKAR 21.113(b):

(i) the type certificate holder has indicated that it has no technical objection to the information submitted under HKAR 21.93; and

(ii) the type certificate holder has agreed to collaborate with the supplemental type certificate holder to ensure discharge of all obligations for continued airworthiness of the changed product through compliance with HKAR 21.44 and 21.118A.

(c) By derogation from points 3 and 4 of point (b), at the applicant's request included in the declaration referred to in HKAR 21.20(d), the applicant is entitled to have a supplemental type certificate for an aircraft issued before the applicant has demonstrated compliance with the operational suitability data certification basis, provided that the applicant demonstrates such compliance before the date at which those data are to be actually used.

(d) A supplemental type certificate shall be limited to the specific configuration(s) in the type certificate to which the related major change relates.

AMC to HKAR 21.115 Requirements for the approval of major changes in the form of a supplemental type certificate (STC)

(a) For STCs approved by HKCAD, the AMC and GM to HKAR 21.20 should be followed by the applicant.

(b) Reserved.

(c) In accordance with HKAR 21.115(d), the compliance demonstration process must always cover the specific configuration(s) in the type certificate (TC) to which the STC under approval is applied. These configurations should be defined by the change to the type certificate considering the type certificate data sheet (TCDS) and the relevant optional installations. The demonstration of compliance should cover these specific applicable configurations. Consequently, the approval of the STC excludes any other configurations, in particular those that already existed, but were not considered in the compliance demonstration process, and those that may be certified in future.

(d) Reserved.

HKAR 21.116 Transferability

A supplemental type certificate shall only be transferred to a natural or legal person that is able to undertake the obligations of HKAR 21.118A and for this purpose has demonstrated its ability to qualify under the criteria of HKAR 21.112B.

GM to HKAR 21.116 Change of STC holder

The applicant should file an application for the change of STC holder using:

(a) CAD Form 33 (DCA 534) for a supplemental type certificate (STC); or

(b) CAD Form 33A (DCA 539) for validation of a supplemental type certificate (STC).

The form can be downloaded from the HKCAD website.

The form should be completed and sent to HKCAD in accordance with the instructions from the application form.

HKAR 21.117 Changes to that part of a product covered by a supplemental type certificate

(a) Minor changes to that part of a product covered by a supplemental type certificate shall be classified and approved in accordance with Subpart D.

(b) Each major change to that part of a product covered by a supplemental type certificate shall be approved as a separate supplemental type certificate in accordance with this Subpart.

(c) By way of derogation from paragraph (b), a major change to that part of a product covered by a supplemental type certificate submitted by the supplemental type certificate holder itself may be approved as a change to the existing supplemental type certificate.

HKAR 21.118A Obligations and HPA marking

Each holder of a supplemental type certificate shall:

(a) Undertake the obligations:

1 laid down in HKAR 21.3A, HKAR 21.3B, HKAR 21.4, HKAR 21.105, HKAR 21.119, HKAR 21.120A and HKAR 21.120B; and

2 implicit in the collaboration with the type certificate holder under HKAR 21.115(b)5(ii);

and for this purpose continue to meet the criteria of HKAR 21.112B;

(b) Specify the marking, including HPA letters, in accordance with HKAR 21.804(a).

HKAR 21.118B Duration and continued validity

(a) A supplemental type certificate shall be issued for an unlimited duration. It shall remain valid subject to:

1 the holder remaining in compliance with HKAR-21; and

2 the certificate not being surrendered or revoked under the applicable administrative procedures established by the Director-General.

(b) Upon surrender or revocation, the supplemental type certificate shall be returned to the Director-General.

HKAR 21.119 Manuals

The holder of a supplemental type certificate shall produce, maintain, and update master copies of variations in the manuals required by the applicable type certification basis, the applicable operational suitability data certification basis and environmental protection requirements for the product, necessary to cover the changes introduced under the supplemental type certificate, and furnish copies of these manuals to the Director-General on request.

HKAR 21.120A Instructions for continued airworthiness

(a) The holder of the supplemental type certificate for an aircraft, engine, or propeller, shall furnish at least one set of the associated variations to the instructions for continued airworthiness, prepared in accordance with the applicable type certification basis, to each known owner of one or more aircraft, engine, or propeller incorporating the features of the supplemental type certificate, upon its delivery, or upon issuance of the first certificate of airworthiness for the affected aircraft, whichever occurs later, and thereafter make those variations in instructions available, on request, to any other person required to comply with any of the terms of those instructions. Availability of some manual or portion of the variations to the instructions for continued airworthiness, dealing with overhaul or other forms of heavy maintenance, may be delayed until after the product has entered into service, but shall be available before any of the products reaches the relevant age or flight-hours/cycles.

(b) In addition, changes to those variations of the instructions for continued airworthiness shall be made available to all known operators of a product incorporating the supplemental type certificate and shall be made available, on request, to any person required to comply with any of those instructions. A programme showing how changes to the variations to the instructions for continued airworthiness are distributed shall be submitted to the Director-General.

HKAR 21.120B Availability of operational suitability data

In the case of a change affecting the operational suitability data, the holder of the supplemental type certificate shall make available:

(a) At least one set of changes to the operational suitability data prepared in accordance with the applicable operational suitability certification basis, to all known operators of the changed aircraft, before the operational suitability data must be used by a training organisation or an operator; and

(b) Any further change to the affected operational suitability data, to all known operators of the changed aircraft; and

(c) On request, the relevant parts of the changes in points (a) and (b) above, to:

1 the Director-General responsible for verifying conformity with one or more elements of the affected operational suitability data; and

2 any person required to comply with one or more elements of this set of operational suitability data.

SUBPART F PRODUCTION WITHOUT PRODUCTION ORGANISATION APPROVAL

HKAR 21.121 Scope

This Subpart establishes:

(a) The procedure for demonstrating the conformity with the applicable design data of a part and appliance that is intended to be manufactured without a production organisation approval under Subpart G.

(b) The rules governing the obligations of the manufacturer of a part or appliance being manufactured under this Subpart.

GM No. 1 to HKAR 21.121 Applicability – individual product, part or appliance

In this context, 'demonstrating the conformity with the applicable design data of a part and appliance means that conformity with the applicable design data has to be established and shown for each and every part or appliance.

GM No. 2 to HKAR 21.121 Applicability – applicable design data

Applicable design data is defined as all the necessary drawings, specifications and other technical information provided by the applicant for, or holder of a design organisation approval, TC, STC, approval of repair or minor change design, or HTSO authorisation, and released in a controlled manner to the manufacturer that produces under HKAR-21 Subpart F. This should be sufficient for the development of production data to enable manufacture in conformity with the design data.

Prior to the issue of the TC, STC, approval of repair or minor change design or HTSO authorisation, or equivalent, design data is defined as 'not approved', but parts and appliances may be released with a CAD Form One as a certificate of conformity.

After the issue of the TC, STC, approval of repair or minor change or HTSO authorisation, or equivalent, this design data is defined as 'approved' and items manufactured in conformity are eligible for release on a CAD Form One for airworthiness purposes.

For the purpose of HKAR-21 Subpart F, the term 'applicable design data' includes the information related to the applicable engine exhaust emissions and aeroplane CO2 emissions production cut-off requirements.

HKAR 21.122 Eligibility

Any natural or legal person may apply to show conformity of individual parts or appliances under this Subpart, if:

(a) it holds for an approval covering the design of that part or appliance; or

(b) it has ensured satisfactory coordination between production and design, through an appropriate arrangement with the holder of, an approval of such a design.

AMC No. 1 to HKAR 21.122 Eligibility – link between design and production

An 'arrangement' is considered suitable if it is documented and satisfies the Director-General that co-ordination is satisfactory.

To achieve satisfactory coordination the documented arrangements must at least define the following aspects irrespective of whether the design organisation and the person producing or intending to produce under HKAR-21 Subpart F are separate legal entities or not:

(a) The responsibilities of a design organisation which assure correct and timely transfer of up-to-date airworthiness data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.);

(b) The responsibilities and procedures of the manufacturer for receiving, managing and using the applicable design data provided by the design organisation;

(c) The responsibilities and procedures of the manufacturer for developing, where applicable, its own manufacturing data in compliance with the applicable data package;

(d) The responsibilities of the manufacturer to assist the design organisation in dealing with continuing airworthiness matters and for required actions (e.g., traceability of parts in case of direct delivery to users, retrofitting of modifications, traceability of processes' outputs and approved deviations for individual parts as applicable, technical information and assistance, etc.);

(e) The scope of the arrangements covering HKAR-21 Subpart F requirements, in particular: HKAR 21.126(a)4 and HKAR 21.129(d) and (f) and associated GM or AMC;

(f) The responsibilities of the manufacturer, in case of products prior to type certification to assist a design organisation in demonstrating compliance with CS (access and suitability of production and test facilities for manufacturing and testing of prototype

models and test specimen);

(g) The procedures to deal adequately with production deviations and non-conforming parts;

(h) The means to achieve adequate configuration control of manufactured parts, to enable the manufacturer to make the final determination and identification for conformity or airworthiness release and eligibility status;

(i) The identification of the responsible persons/offices who control the above; and

(j) The acknowledgment by the holder of the TC/STC/repair or change approval/HTSO authorisation that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved.

In many cases the person producing or intending to produce under HKAR-21 Subpart F may receive the approved design data through an intermediate production organisation. This is acceptable provided an effective link between the design approval holder and the production organisation can be maintained to satisfy the intent of HKAR 21.122.

When the design organisation and the manufacturer are two separate legal entities a Direct Delivery Authorisation must be available for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.

Where there is no general agreement for Direct Delivery Authorisation, specific permissions may be granted (refer to AMC to HKAR 21.4).

AMC No. 2 to HKAR 21.122 Eligibility – link between design and production

In accordance with AMC No. 1 to HKAR 21.122 the person producing or intending to produce under HKAR-21 Subpart F should demonstrate to the Director-General that it has entered into an arrangement with the design organisation. The arrangement must be documented irrespective of whether the two organisations are separate legal entities or not.

The documented arrangement must facilitate the person producing or intending to produce under HKAR-21 Subpart F to demonstrate compliance with the requirement of HKAR 21.122 by means of written documents agreed.

In the case where the design organisation and the person producing or intending to produce under HKAR-21 Subpart F are part of the same legal entity these interfaces may be demonstrated by company procedures accepted by the Director-General.

In all other cases to define such a design/production interface the following sample format is offered:

Arrangement Sample Form

<table>
<tr><td colspan="2">ARRANGEMENT
In accordance with HKAR 21.122</td></tr>
<tr><td>The undersigned agree on the following commitments:</td><td>Relevant interface procedures</td></tr>
<tr><td>The design organisation [NAME] takes responsibility to:
- assure correct and timely transfer of up-to-date applicable design data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.) to the person producing under HKAR-21 Subpart F [NAME];
- provide visible statement(s) of approved design data.</td><td></td></tr>
<tr><td>The person producing under HKAR-21 Subpart F [NAME] takes responsibility to:
- assist the design organisation [NAME] in dealing with continuing airworthiness matter and for required actions;
- assist the design organisation [NAME] in case of products prior to type certification in demonstrating compliance with certification specifications;
- develop, where applicable, its own manufacturing data in compliance with the airworthiness data package.</td><td></td></tr>
<tr><td>The design organisation [NAME] and the person producing under HKAR-21 Subpart F [NAME] take joint responsibility to:
- deal adequately with production deviations and non-conforming parts in accordance with the applicable procedures of the design organisation and the manufacturer producing under HKAR-21 Subpart F;
- achieve adequate configuration control of manufactured parts, to enable the manufacturer producing under HKAR-21 Subpart F to make the final determination and identification for conformity.</td><td></td></tr>
<tr><td colspan="2">The scope of production covered by this arrangement is detailed in [DOCUMENT REFERENCE/ATTACHED LIST]</td></tr>
<tr><td colspan="2">[When the design organisation is not the same legal entity as the manufacturer producing under HKAR-21 Subpart F]
Transfer of approved design data:
The design authorisation holder [NAME] acknowledges that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved by the Director-General and therefore the parts and appliances manufactured in accordance with these data and found in a condition for safe operation may be released certifying that the item was manufactured in conformity to approved design data and is in a condition for safe operation.</td></tr>
<tr><td colspan="2">[When the design organisation is not the same legal entity as the manufacturer producing under HKAR-21 Subpart F]
Direct Delivery Authorisation
This acknowledgment includes also [OR does not include] the general agreement for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.</td></tr>
<tr><td>For the [NAME of the design organisation / DOA holder]
Date: Signature:
xx.xx.xxxx
([NAME in block letters])</td><td>For the [NAME of the person producing under HKAR-21 Subpart F]
Date: Signature:
xx.xx.xxxx
([NAME in block letters])</td></tr>
</table>

Instructions for completion:

Title: The title of the relevant document must clearly indicate that it serves the purpose of a design/production interface arrangement in accordance with HKAR 21.122.

Commitment: The document must include the basic commitments between the design organisation and the manufacturer producing under HKAR-21 Subpart F as addressed in AMC to HKAR 21.4 and AMC No. 1 to HKAR 21.122.

Relevant Procedures: Identify an entry point into the documentary system of the organisation with respect to the implementation of the arrangement (for example a contract, quality plan, handbooks, common applicable procedures, working plans etc.).

Scope of arrangement: The scope of arrangement must state by means of a list or reference to relevant documents those parts or appliances that are covered by the arrangement.

Transfer of applicable design data: Identify the relevant procedures for the transfer of the applicable design data required by HKAR 21.122 and AMC No. 1 to HKAR 21.122 from the design organisation to the person producing under HKAR-21 Subpart F. The means by which the design organisation advises the persons producing under HKAR-21 Subpart F whether such data is approved or not approved must also be identified (ref. HKAR 21.4 / AMC to HKAR 21.4).

Direct Delivery Authorisation: Where the design organisation and the person producing under HKAR-21 Subpart F are separate legal entities the arrangement must clearly identify whether authorisation for direct delivery to end users is permitted or not.

Where any intermediate production/design organisation is involved in the chain between the original design organisation and the person producing under HKAR-21 Subpart F, evidence must be available that this intermediate organisation has received authority from the design organisation to grant Direct Delivery Authorisation.

Signature: AMC No. 1 to HKAR 21.122 requests the identification of the responsible persons/offices who control the commitments laid down in the arrangement. Therefore the basic document must be signed mutually by the authorised representatives of the design organisation and the manufacturer producing under HKAR-21 Subpart F in this regard.

HKAR 21.124 Application

(a) Each application for an agreement to the showing of conformity of individual parts and appliances under this Subpart shall be made in a form and manner established by the Director-General.

(b) Such application shall contain:

1 evidence which demonstrates, where applicable, that:

(i) the issue of a production organisation approval under Subpart G would be inappropriate;

(ii) reserved;

2 an outline of the information required in HKAR 21.125A(b).

GM to HKAR 21.124(a) Application

The applicant may apply to the Director-General for a letter of agreement to the showing of conformity of individual parts and appliances under this subpart.

An application may be accepted from:

(a) An individual applying on his or her own behalf; or

(b) In the case of any organisation, an individual with the authority to make agreements on behalf of the organisation.

GM to HKAR 21.124(b)1(i) Applicability – inappropriate approval under Subpart G

The issue of a letter of agreement of production under HKAR-21 Subpart F may be agreed by the Director-General when:

(a) The aeronautical parts and/or appliances to be produced under this subpart intended for airborne use as part of a type certificated product (this excludes simulators, ground equipment and tools), and

(b) The Director-General determines that HKAR-21 Subpart G would be inappropriate, and consequently HKAR-21 Subpart F applies. The main difference between HKAR-21 Subparts G and F is that Subpart G requires the existence of a Quality System which provides the Director-General with the necessary confidence to grant to the manufacturer the privileges of certifying its own production. There are situations where a Quality System, including independent monitoring and continuous internal evaluation functions, is not justified and /or feasible. In making the determination that Subpart F may apply, the Director-General may take into account one or a combination of parameters such as the following:

1 no flow production (infrequent or low volume of production);

2 simple technology (enabling effective inspection phases during the manufacturing process);

3 very small organisation; and

4 the production is out of the capability of any existing HKAR-21 PO.

GM to HKAR 21.124(b)2 Application – minimum information to include with the application

At this early stage, provision of the complete manual is not necessary, but at least the following items should be covered:

(a) Table of Contents of the Manual (including list of existing inspection system documents or procedures);

(b) Description of items to be manufactured (including intended quantities /deliveries);

(c) List of possible suppliers;

(d) General description of facilities;

(e) General description of production means; and

(f) Accountable personnel.

HKAR 21.125A Issue of a letter of agreement

The applicant shall be entitled to have a letter of agreement issued by the Director-General agreeing to the showing of conformity of individual parts and appliances under this Subpart, after:

(a) Having established a production inspection system that ensures that each part or appliance conforms to the applicable design data and is in condition for safe operation;

(b) Having provided a manual (which can be part of the existing manual/exposition) that contains:

1 a description of the production inspection system required under point (a);

2 a description of the means for making the determination of the production inspection system; and

3 a description of the tests as required, and the names of persons authorised for the purpose of HKAR 21.130(a); and

(c) Demonstrating that it is able to provide assistance in accordance with HKAR 21.3A and HKAR 21.129(d).

GM to HKAR 21.125A Letter of agreement – meaning of individual

'Individual' means that each part number or type of item (i.e., part or appliance) to be produced should be specifically referenced, either directly or through a referenced capability list, in the letter of agreement from the Director-General. The letter may also specify any limitation in the production rate.

GM No. 1 to HKAR 21.125A(b) Letter of agreement – contents of the Manual

The manual (which can be part of the existing manual/exposition) referred in HKAR 21.125A(b) should include, at least the following information:

(a) Declaration by the applicant of undertaking in respect of

1 the requirements defined in HKAR-21 Subpart F; and

2 the procedures contained in the manual and in the documentation mentioned herein;

(b) Declaration by the applicant certifying the conformity of the manual to the requirements defined in HKAR-21 Subpart F;

(c) Jobs, power and responsibilities of the accountable personnel;

(d) Organisation chart, if required by the Director-General;

(e) Description of the resources, including human resources, with an indication of the personnel qualification criteria;

(f) Description of location and equipment;

(g) Description of the scope of work, the production processes and techniques, and reference to the 'capability list';

(h) Communications with the Director-General, and specifically those required by HKAR 21.125A(c);

(i) Assistance and communication with the design approval holder, and the means of compliance with 21.A.125A(c);

(j) Amendments to the Manual;

(k) Description of the Inspection System (including test, see GM No. 2 to HKAR 21.125A(b)), and the procedures to meet HKAR 21.126 and associated GM;

(l) List of suppliers; and

(m) Issuing of the Statement of Conformity and Director-General inspection for validation.

If the information is listed in the Manual in a different order, a cross-reference to the above list should be made available in the Manual.

GM No. 2 to HKAR 21.125A(b) Letter of agreement – Production Inspection System: Functional Tests

All items produced should be subject to inspection to be carried out at suitable phases which permit an effective verification of conformity with the design data.

These inspections may provide for the execution of tests to measure performances as set out in the applicable design data.

Considerations of complexity of the item and/or its integration in the next level of production will largely determine the nature and time for these tests, for example:

- appliances - will require full functional testing to the specifications;

- parts - will at least require basic testing to establish conformity, but due allowance may be made for further testing carried out at the next level of production;

- material - will require verification of its stated properties.

GM to HKAR 21.125A(c) Letter of agreement – assistance

The Director-General should be provided with material which defines the means of providing assistance as required by HKAR 21.125A(c). Suitable descriptive material should be included in the Manual, as described in GM No. 1 to HKAR 21.125A(b).

HKAR 21.125B Findings

(a) When objective evidence is found showing non-compliance of the holder of a letter of agreement with the applicable requirements of HKAR-21, the finding shall be classified as follows:

1 a level one finding is any non-compliance with HKAR-21 which could lead to uncontrolled non-compliances with applicable design data and which could affect the safety of the aircraft;

2 a level two finding is any non-compliance with HKAR-21 which is not classified as level one;

3 an observation is any item where it has been identified, by objective evidence, to contain potential problems that could lead to a non-compliance under point (a).

(b) After receipt of notification of findings / observations according to HKAR 21.125:

1 in case of a level one findings, the holder of the letter of agreement shall demonstrate corrective action to the satisfaction of the Director-General within a period of no more than 21 working days after written confirmation of the finding;

2 in case of level two 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 three months. In certain circumstances and subject to the nature of the finding, the Director-General may extend the three months period subject to the provision of a satisfactory corrective action plan agreed by the Director-General;

3 an observation shall not require immediate action by the holder of the letter of agreement.

(c) In case of level one or level two findings, the letter of agreement may be subject to a partial or full limitation, suspension and revocation. The holder of the letter of agreement shall provide confirmation of receipt of the notice of limitation, suspension or revocation of the letter of agreement in a timely manner.

GM No. 1 to HKAR 21.125B(a) Uncontrolled non-compliance with applicable design data

An uncontrolled non-compliance with applicable design data is a non-compliance:

(a) That cannot be discovered through systematic analysis or;

(b) That prevents identification of affected parts, appliances, or material.

GM No. 2 to HKAR 21.125B(a) Examples for level one findings

Examples for level 1 findings are non-compliances with any of the following points, that could affect the safety of the aircraft:

HKAR 21.126, HKAR 21.129.

It should be anticipated that a non-compliance with these points is only considered a level one finding when objective evidence has been found that this finding is an uncontrolled non-compliance that could affect the safety of the aircraft.

HKAR 21.125C Duration and continued validity

(a) The letter of agreement shall be issued for a limited duration not exceeding one year. It shall remain valid unless:

1 the holder of the letter of agreement fails to demonstrate compliance with the applicable requirements of this Subpart; or

2 there is evidence that the applicant cannot maintain satisfactory control of the manufacture of parts or appliances under the agreement; or

3 the applicant no longer meets the requirements of HKAR 21.122; or

4 the letter of agreement has been surrendered, revoked, or has expired.

(b) Upon surrender, revocation or expiry, the letter of agreement shall be returned to the Director-General.

HKAR 21.126 Production inspection system

(a) The production inspection system required under HKAR 21.125A(a) shall provide a means for determining that:

1 incoming materials, and bought or subcontracted parts, used in the finished product are as specified in the applicable design data;

2 incoming materials, and bought or subcontracted parts, are properly identified;

3 processes, manufacturing techniques and methods of assembly affecting the quality and safety of the finished product are accomplished in accordance with specifications accepted by the Director-General; and

4 design changes, including material substitutions, have been approved under Subpart D or E and controlled before being incorporated in the finished product.

(b) The production inspection system required by HKAR 21.125A(a), shall also be such as to ensure that:

1 parts in process are inspected for conformity with the applicable design data at points in production where accurate determinations can be made;

2 materials subject to damage and deterioration are suitably stored and adequately protected;

3 current design drawings are readily available to manufacturing and inspection personnel, and used when necessary;

4 rejected materials and parts are segregated and identified in a manner that precludes installation in the finished product;

5 materials and parts that are withheld because of departures from design data or specifications, and that are to be considered for installation in the finished product, are subjected to an approved engineering and manufacturing review procedure. Those materials and parts determined by this procedure to be serviceable shall be properly identified and re-inspected if rework or repair is necessary. Materials and parts rejected by this procedure shall be marked and disposed of to ensure that they are not incorporated in the final product; and

6 records produced under the production inspection system are maintained, identified with the completed part where practicable, and retained by the applicant in order to provide the information necessary to ensure the continued airworthiness of the part.

GM to HKAR 21.126 Production inspection system

GM to HKAR 21.126(a) and (b) have been developed for persons producing under HKAR-21 Subpart F on the long term basis as defined in HKAR 21.124(b)1(i).

GM to HKAR 21.126(a)1 Production inspection system – conformity of supplied parts, appliances and material

(a) The person applied for production under Subpart F is responsible for determining and applying acceptance standards for physical condition, configuration status and conformity, as appropriate, of raw materials, subcontracted works, and supplied products, parts, appliances or material, whether to be used in production or delivered to customers as spare parts. This responsibility also includes BFE (Buyer Furnished Equipment) items.

(b) Control may be based upon use of the following techniques, as appropriate:

1 first article inspection, including destruction if necessary, to verify that the article conforms to the applicable data for new production line or new supplier;
2 incoming inspections and tests of supplied parts or appliances that can be satisfactorily inspected on receipt;

3 identification of incoming documentation and data relevant to the showing of conformity to be included in the certification documents; or

4 any additional work, tests or inspection which may be needed for parts or appliances which are to be delivered as spare parts and which are not subject to the checks normally provided by subsequent production or inspection stages.

(c) The person applied for production under HKAR-21 Subpart F may rely upon a Certificate of Conformity (C of C) issued in accordance with this Subpart if provided as evidence of conformity with applicable design data.

For suppliers not holding a POA inspection system, the person applied for production under HKAR-21 Subpart F should ensure a system for control of incoming materials and bought or subcontracted items which provides for inspections and tests of such items by the person applied for production under HKAR-21 Subpart F at the supplier's facility was established, if the item cannot or will not be completely inspected upon receipt.

GM to HKAR 21.126(a)2 Production inspection system – identification of incoming materials and parts

All parts and materials coming from external parties should be identified and inspected to ascertain that they have not been damaged during transport or unpacking, that the incoming parts and materials have the appropriate and correct accompanying documentation and that the configuration and condition of the parts or materials is as laid down in that documentation.

Only on completion of these checks and of any incoming further verifications laid down in the procurement specification, may the part or material be accepted for warehousing and used in production.

This acceptance should be certified by an inspection statement.

A suitable recording system should allow reconstruction at any time of the history of every material or part.

The areas where the incoming checks are carried out and the materials or parts are stored pending completion of the checks should be physically segregated from other departments.

GM No. 1 to HKAR 21.126(a)3 Production inspection system – list of specifications

It is the responsibility of:

(a) The designer, to define all necessary processes, techniques and methods to be followed during manufacture and this information will be provided as part of the

applicable design data.

(b) The applicant, to ensure that all processes are carried out strictly in accordance with the specifications provided as part of the applicable design data.

GM No. 2 to HKAR 21.126(a)3 Production inspection system – means of checking of the production processes

The Production Inspection System should be provided with appropriate means of checking that production processes, whether performed by the person applied for production under HKAR-21 Subpart F or by sub-contractors under its control, are carried out in accordance with applicable data, including:

(a) A system for the control and authorised amendment of data provided for the production, inspection and test to ensure that it is complete and up-to-date at the point of use;

(b) Availability of personnel with suitable qualification, experience, and training for each required production, inspection, and test task. Special attention should be paid to tasks requiring specialised knowledge and skill, e.g., NDT/NDI, welding...;

(c) A working area where the working conditions and environment are controlled as appropriate in respect of: cleanliness, temperature, humidity, ventilation, lighting, space/access, protection against noise and pollution;

(d) Equipment and tools sufficient to enable all specified tasks to be accomplished in a safe and effective manner without detrimental effect on the items under production. Calibration control of equipment and tools which affect critical dimensions and values must demonstrate compliance with, and be traceable to, recognised national or international standards.

GM to HKAR 21.126(b)1 Production inspection system – inspection parts in process

The purpose of the Production Inspection System is to check at suitable points during production and provide objective evidence that the correct specifications are used, and that processes are carried out strictly in accordance with the specification.

During the manufacturing process, each article should be inspected in accordance with a plan which identifies the nature of all inspections required and the production stages at which they occur. The plan should also identify any particular skills or qualification required of person(s) carrying out the inspections (e.g., NDT personnel). A copy of the plan should be included in, or referenced by, the manual required by HKAR 21.125A(b).

If the parts are such that, if damaged, they could compromise the safety of the aircraft, additional inspections for such damage should be performed at the completion of each production stage.

GM to HKAR 21.126(b)2 Production inspection system – suitable storage and protection

(a) Storage areas should be protected from dust, dirt, or debris, and adequate blanking and packaging of stored items should be practiced.

(b) All parts should be protected from extremes of temperatures and humidity and, where needed, temperature-controlled or full air-conditioned facilities should be provided.

(c) Racking and handling equipment should be provided such as to allow storage, handling and movement of parts without damage.

(d) Lighting should be such as to allow safe and effective access and handling, but should also cater for items which are sensitive to light e.g., rubber items.

(e) Care should be taken to segregate and shield items which can emit fumes (e.g., wet batteries), substances or radiation (e.g., magnetic items) which are potentially damaging to other stored items.

(f) Procedures should be in place to maintain and record stored parts identities and batch information.

(g) Access to storage areas should be restricted to authorised personnel who are fully trained to understand and maintain the storage control arrangements and procedures.

(h) Provisions should be made for segregated storage of non-conforming items pending their disposition (see GM 21.126(b)4).

GM to HKAR 21.126(b)3 Production inspection system – use of derived data instead of original design data

Where derived data, e.g. worksheets, process sheets, fabrication/inspection instructions, etc., is used instead of original design drawings, documents identification and control procedures should be used to ensure that the documentation in use is always accurate and current.

GM to HKAR 21.126(b)4 Production inspection system – segregation of rejected material

All materials and parts which have been identified at any stage in the manufacturing process as not conforming to the specific working and inspection instructions must be suitably

identified by clearly marking or labelling, to indicate their non-conforming status.

All such non-conforming material or parts should be removed from the production area and held in a restricted access segregated area until an appropriate disposition is determined in accordance with HKAR 21.126(b)5.

GM to HKAR 21.126(b)5 Production inspection system – engineering and manufacturing review procedure

(a) The procedure should permit to record the deviation, to present it to the Design holder under the provisions of HKAR 21.122, and to record the results of the review and actions taken consequently as regards the part.

(b) Any unintentional deviation from the manufacturing/inspection data should be recorded and handled in accordance with HKAR-21 Subpart D or E as changes to the approved design.

GM to HKAR 21.126(b)6 Production inspection system – recording and record keeping

(a) Records within a production environment satisfy two purposes. Firstly, they should, during the production process to ensure that parts or appliances are in conformity with the controlling data throughout the manufacturing cycle. Secondly, certain records of milestone events are needed to subsequently provide objective evidence that all prescribed stages of the production process have been satisfactorily completed and that compliance with the applicable design data has been achieved.

1 Therefore, the person applied for production under HKAR-21 Subpart F should implement a system for the compilation and retention of records during all stages of manufacture, covering short-term and long-term records appropriate to the nature of the product and its production processes.

2 The management of such information should be subject to appropriate documented procedures in the Manual required by HKAR 21.125A(b).

3 All forms of recording media are acceptable (paper, film, magnetic ...) provided they can meet the required duration for archiving under the conditions provided.

(b) The related procedures should:

1 Identify records to be kept;

2 Describe the organisation of and responsibility for the archiving system (location, compilation, format) and conditions for access to the information (e.g., by product, subject);

3 Control access and provide effective protection from deterioration or accidental damage;

4 Ensure continued readability of the records;

5 Demonstrate to the Director-General proper functioning of the records system;

6 Clearly identify the persons involved in conformity determination;

7 Define an archiving period for each type of data taking into account importance in relation to conformity determination subject to the following:

(i) Data which supports conformity of a part, or appliance should be kept for not less than three years from the issue date of the related Statement of Conformity; and

(ii) Data considered essential for continuing airworthiness should be kept throughout the operational life of the part or appliance; and

8 Data related to supplied parts may be retained by the supplier if the supplier has a system agreed under HKAR-21 Subpart F by the Director-General. The manufacturer should, in each case, define the archiving period and satisfy himself or herself and the Director-General that the recording media are acceptable.

HKAR 21.129 Obligations of the applicant

Each applicant for production of a part or appliance being manufactured under this Subpart shall:

(a) Make each part or appliance available for inspection by the Director-General;

(b) Maintain at the place of manufacture the technical data and drawings necessary to determine whether the product conforms to the applicable design data;

(c) Maintain the production inspection system that ensures that each product conforms to the applicable design data and is in condition for safe operation;

(d) Provide assistance to the holder of the design approval in dealing with any continuing airworthiness actions that are related to the parts or appliances that have been produced; and

(e) Establish and maintain an internal occurrence reporting system in the interest of safety, to enable the collection and assessment of occurrence reports in order to identify adverse trends or to address deficiencies, and to extract reportable occurrences. This system shall include evaluation of relevant information relating to occurrences and the promulgation of related information;

(f)

1 report to the holder of the design approval, all cases where parts or appliances have been released by the manufacturer and subsequently identified to have deviations from the applicable design data, and investigate with the holder of the design approval in order to identify those deviations which could lead to an unsafe condition.

2 report to the Director-General the deviations which could lead to an unsafe condition identified according to subparagraph 1. Such reports shall be made in a form and manner established by the Director-General under HKAR 21.3A(b)2.

3 where the manufacturer acts as supplier to another production organisation, report also to that other organisation all cases where it has released parts or appliances to that organisation and subsequently identified them to have possible deviations from the applicable design data.

GM to HKAR 21.129(a) Availability for inspection by the Director-General

Each part or appliance should be made available for inspection at any time at the request of the Director-General.

It is recommended that a pre-defined plan of inspection points be established and agreed with the Director-General to be used as a basis for such inspections.

The applicant should provide such documentation, tools, personnel, access equipment etc. as necessary to enable the Director-General to perform the inspections.

HKAR 21.130 Statement of conformity

(a) A Certification of Conformity (C of C) shall be raised for a part or appliance manufactured under this Subpart. This C of C shall be signed by an authorised person who holds a responsible position in the manufacturing organisation.

(b) A statement of conformity (in form of a C of C) shall include:

1 for each part or appliance a statement that the part or appliance, conforms to the approved design data and is in condition for safe operation; and

2 the CAD acceptance reference for production under Subpart F.

SUBPART G PRODUCTION ORGANISATION APPROVAL

HKAR 21.131 Scope

This Subpart establishes:

(a) The procedure for the issuance of a production organisation approval for a production organisation showing conformity of products, parts and appliances with the applicable design data.

(b) The rules governing the rights and obligations of the applicant for, and holders of, such approvals.

GM to HKAR 21.131 Scope – applicable design data

Applicable design data is defined as all necessary drawings, specifications and other technical information provided by the applicant for, or holder of a design organisation approval, TC, STC, approval of repair or minor change design, or HTSO authorisation and released in a controlled manner to a production organisation approval holder. This should be sufficient for the development of production data to enable repeatable manufacture to take place in conformity with the design data.

Prior to issue of the TC, STC, approval of repair or minor change design or HTSO authorisation, or equivalent, design data is defined as 'not approved' but parts and appliances may be released with a CAD Form One as a certificate of conformity.

After issue of the TC, STC, approval of repair or minor change or HTSO authorisation, or equivalent, this design data is defined as 'approved' and items manufactured in conformity are eligible for release on a CAD Form One for airworthiness purposes.

For the purpose of Subpart G of HKAR-21 the term 'applicable design data' includes, in case of engines and when applicable, the information related to the applicable engine exhaust emissions and aeroplane CO2 emissions production cut-off requirement.

HKAR 21.133 Eligibility

Any natural or legal person ('organisation') shall be eligible as an applicant for an approval under this Subpart. The applicant shall:

(a) justify that, for a defined scope of work, an approval under this Subpart is appropriate for the purpose of showing conformity with a specific design; and

(b) hold or have applied for an approval of that specific design; or

(c) have ensured, through an appropriate arrangement with the applicant for, or holder of, an approval of that specific design, satisfactory coordination between production and design.

GM to HKAR 21.133(a) Eligibility – approval appropriate for showing conformity

'Appropriate' should be understood as follows:

- The applicant produces or intends to produce aeronautical products, parts and/or appliances intended for airborne use as part of a type certificated product (this excludes simulators, ground equipment and tools).

- The applicant will be required to show a need for an approval, normally based on one or more of the following criteria:

    1 Production of aircraft, engines or propellers (except if the Director-General considers a POA inappropriate)

    2 Production of HTSO articles and parts marked HPA

    3 Direct delivery to users such as owners or operators maintenance organisations with the need for exercising the privileges of issuing Authorised Release Certificates – CAD Form One

    4 Participation in an international co-operation program where working under an approval is considered necessary by the Director-General

    5 Criticality and technology involved in the part or appliance being manufactured. Approval in this case may be found by the Director-General as the best tool to exercise its duty in relation to airworthiness control

    6 Where an approval is otherwise determined by the Director-General as being required

- It is not the intent of the Director-General to issue approvals to manufacturing firms that perform only sub-contract work for main manufacturers of products and are consequently placed under their direct surveillance.

- Where standard parts, materials, processes or services are included in the applicable design data (see guidance on applicable design data in GM to HKAR 21.131) their standards should be controlled by the POA holder in a manner which is satisfactory for the final use of the item on the product, part or appliance. Accordingly, the

manufacturer or provider of the following will not at present be considered for production organisation approval:

- consumable materials
- raw materials
- standard parts
  - parts identified in the product support documentation as ‘industry supply’ or ‘no hazard’
- non-destructive testing or inspection
- processes (heat treatment, surface finishing, shot peening, etc.)

AMC No. 1 to HKAR 21.133(b) and (c) Eligibility – link between design and production organisations

An arrangement is considered appropriate if it is documented and satisfies the Director-General that co-ordination is satisfactory.

To achieve satisfactory coordination the documented arrangements must at least define the following aspects irrespective of whether the two organisations are separate legal entities or not:

- The responsibilities of a design organisation which assure correct and timely transfer of up-to-date airworthiness data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.);
- The responsibilities and procedures of a POA holder/applicant for developing, where applicable, its own manufacturing data in compliance with the airworthiness data package;
- The responsibilities of a POA holder/applicant to assist the design organisation in dealing with continuing airworthiness matters and for required actions (e.g., traceability of parts in case of direct delivery to users, retrofitting of modifications, traceability of processes' outputs and approved deviations for individual parts as applicable, technical information and assistance, etc.);
- The scope of the arrangements must cover HKAR-21 Subpart G requirements and associated AMC and GM, in particular: HKAR 21.145(b), HKAR 21.165(c), (f) and (g);
- The responsibilities of a POA holder/applicant, in case of products prior to type certification to assist a design organisation in showing compliance with CS (access and

suitability of production and test facilities for manufacturing and testing of prototype models and test specimen);

- The procedures to deal adequately with production deviations and non-conforming parts;

- The procedures and associated responsibilities to achieve adequate configuration control of manufactured parts, to enable the production organisation to make the final determination and identification for conformity or airworthiness release and eligibility status;

- The identification of the responsible persons/offices who control the above;

- The acknowledgment by the holder of the TC/STC/repair or change approval/HTSO authorisation that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved.

In many cases the production organisation may receive the approved design data through an intermediate production organisation. This is acceptable provided an effective link between the design approval holder and the production organisation can be maintained to satisfy the intent of HKAR 21.133.

When the design and production organisations are two separate legal entities a Direct Delivery Authorisation must be available for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.
Where there is no general agreement for Direct Delivery Authorisation, specific permissions may be granted (refer to AMC to HKAR 21.4).

AMC No. 2 to HKAR 21.133(b) and (c) Eligibility – link between design and production organisations

In accordance with AMC No.1 to HKAR 21.133(b) and (c) the POA holder must demonstrate to the Director-General that it has entered into an arrangement with the design organisation. The arrangement must be documented irrespective of whether the two organisations are separate legal entities or not.

The documented arrangement must facilitate the POA holder to demonstrate compliance with the requirement of HKAR 21.133(b) and (c) by means of written documents agreed.

In the case where the design organisation and POA holder are part of the same legal entity these interfaces may be demonstrated by company procedures accepted by the Director-General.

In all other cases to define such a design/production interface the following sample format is offered:

Arrangement Sample Form

<table>
<tr><td colspan="2">ARRANGEMENT
i.a.w. HKAR 21.133(b) and (c)</td></tr>
<tr><td>The undersigned agree on the following commitments:</td><td>Relevant interface procedures</td></tr>
<tr><td>The design organisation [NAME] takes responsibility to
- assure correct and timely transfer of up-to-date applicable design data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.) to the production organisation approval holder [NAME]
- provide visible statement(s) of approved design data</td><td></td></tr>
<tr><td>The production organisation approval holder [NAME] takes responsibility to
- assist the design organisation [NAME] in dealing with continuing airworthiness matter and for required actions
- assist the design organisation [NAME] in case of products prior to type certification in showing compliance with airworthiness requirements (certification specifications)
- develop, where applicable, its own manufacturing data in compliance with the airworthiness data package</td><td></td></tr>
<tr><td>The design organisation [NAME] and the POA holder [NAME] take joint responsibility to
- deal adequately with production deviations and non-conforming parts in accordance with the applicable procedures of the design organisation and the production organisation approval holder
- achieve adequate configuration control of manufactured parts, to enable the POA holder to make the final determination and identification for conformity or airworthiness release and eligibility status.</td><td></td></tr>
<tr><td colspan="2">The scope of production covered by this arrangement is detailed in ... [DOCUMENT REFERENCE / ATTACHED LIST]</td></tr>
<tr><td colspan="2">[When the design organisation is not the same legal entity as the production organisation approval holder]

Transfer of approved design data
The design organisation [NAME] acknowledges that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved (by the Director-General and therefore the parts and appliances manufactured in accordance with these data and found in a condition for safe operation may be released certifying that the item was manufactured in conformity to approved design data and is in a condition for safe operation..)</td></tr>
<tr><td colspan="2">[When the design organisation is not the same legal entity as the production organisation approval holder]

Direct Delivery Authorisation
This acknowledgment includes also [OR does not include] the general agreement for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.</td></tr>
<tr><td>for the [NAME of the design organisation / DOA holder]

date signature

xx.xx.xxxx
([NAME in block letters])</td><td>for the [NAME of the POA holder]

date signature

xx.xx.xxxx
([NAME in block letters])</td></tr>
</table>

Instructions for completion:

Title: The title of the relevant document must clearly indicate that it serves the purpose of a design/production interface arrangement in accordance with HKAR 21.133(b) and (c).

Commitment: The document must include the basic commitments between the design organisation and the POA holder as addressed in AMC to HKAR 21.4 and AMC No. 1 to HKAR 21.133(b) and (c).

Relevant Procedures: Identify an entry point into the documentary system of the organisation with respect to the implementation of the arrangement (for example a contract, quality plan, handbooks, common applicable procedures, working plans etc.).

Scope of arrangement: The scope of arrangement must state by means of a list or reference to relevant documents those products, parts or appliances that are covered by the arrangement.

Transfer of applicable design data: Identify the relevant procedures for the transfer of the applicable design data required by HKAR 21.131 and GM to HKAR 21.131 from the design organisation to the POA holder. The means by which the design organisation advises the POA holder whether such data is approved or not approved must also be identified (ref. HKAR 21.4 / AMC to HKAR 21.4).

Direct Delivery Authorisation: Where the design organisation and the POA holder are separate legal entities the arrangement must clearly identify whether authorisation for direct delivery to end users is permitted or not.

Where any intermediate production/design organisations are involved in the chain between the original design organisation and the POA holder evidence must be available that this intermediate organisation has received authority from the design organisation to grant Direct Delivery Authorisation.

Signature: AMC No. 1 to HKAR 21.133(b) and (c) requests the identification of the responsible persons/offices who control the commitments laid down in the arrangement. Therefore the basic document must be signed mutually by the authorised representatives of the design organisation and the POA holder in this regard.

HKAR 21.134 Application

Each application for a production organisation approval shall be made to the Director-General in a form and manner established by the Director-General, and shall include an outline of the information required by HKAR 21.143 and the terms of approval requested to be issued under HKAR 21.151.

AMC to HKAR 21.134 Form and manner

The applicant should file an application using application forms 'Application for Production Organisation Approval' DCA 533 (CAD Form 50). This form is available from the CAD website.

The form should be completed in accordance with the instructions of the application form.

HKAR 21.135 Issue of production organisation approval

An organisation shall be entitled to have a production organisation approval issued by the Director-General when it has demonstrated compliance with the applicable requirements under this Subpart.

HKAR 21.139 Quality System

(a) The production organisation shall demonstrate that it has established and is able to maintain a quality system. The quality system shall be documented. This quality system shall be such as to enable the organisation to ensure that each product, part or appliance produced by the organisation or by its partners, or supplied from or sub-contracted to outside parties, conforms to the applicable design data and is in condition for safe operation, and thus exercise the privileges set forth in HKAR 21.163.

(b) The quality system shall contain:

1 As applicable within the scope of approval, control procedures for:

(i) document issue, approval, or change.

(ii) vendor and sub-contractor assessment audit and control.

(iii) verification that incoming products, parts, materials, and equipment, including items supplied new or used by buyers of products, are as specified in the applicable design data.

(iv) identification and traceability.

(v) manufacturing processes.

(vi) inspection and testing, including production flight tests.

(vii) calibration of tools, jigs, and test equipment.

(viii) non-conforming item control.

(ix) airworthiness coordination with the applicant for, or holder of, the design approval.

(x) records completion and retention.

(xi) personnel competence and qualification.

(xii) issue of airworthiness release documents.

(xiii) handling, storage and packing.

(xiv) internal quality audits and resulting corrective actions.

(xv) work within the terms of approval performed at any location other than the approved facilities.

(xvi) reserved.

(xvii) reserved.

The control procedures need to include specific provisions for any critical parts.

2 An independent quality assurance function to monitor compliance with, and adequacy of, the documented procedures of the quality system. This monitoring shall include a feedback system to the person or group of persons referred to in HKAR 21.145(c)2 and ultimately to the manager referred to in HKAR 21.145(c)1 to ensure, as necessary, corrective action.

GM No. 1 to HKAR 21.139(a) Quality System

The quality system is an organisational structure with responsibilities, procedures, processes, and resources which implement a management function to determine and enforce quality principles.

The quality system should be documented in such a way that the documentation can be made easily available to personnel who need to use the material for performing their normal duties, in particular:

- procedures, instructions, data to cover the issues of HKAR 21.139(b)1 are available in a written form,

- distribution of relevant procedures to offices/persons is made in a controlled manner,

- procedures which identify persons responsible for the prescribed actions are established,

- the updating process is clearly described.

The manager responsible for ensuring that the quality system is implemented and maintained should be identified.

The Director-General will verify on the basis of the exposition and by appropriate investigations that the production organisation has established and can maintain their documented quality system.

GM No. 2 to HKAR 21.139(a) Quality System – conformity of supplied parts or appliances

The POA holder is responsible for determining and applying acceptance standards for physical condition, configuration status and conformity of supplied products, parts or appliances, whether to be used in production or delivered to customers as spare parts. This responsibility also includes BFE (Buyer Furnished Equipment) items.

To discharge this responsibility the quality system needs an organisational structure and procedures to adequately control suppliers. Elements of the quality system for the control of suppliers may be performed by other parties provided that the conditions of AMC No. 1 or No. 2 to HKAR 21.139(b)1(ii) are met.

Control can be based upon use of the following techniques (as appropriate to the system or product orientation necessary to ensure conformity):

- qualification and auditing of supplier's quality system,

- evaluation of supplier capability in performing all manufacturing activities, inspections and tests necessary to establish conformity of parts or appliances to type design,

- first article inspection, including destruction if necessary, to verify that the article conforms to the applicable data for new production line or new supplier,

- incoming inspections and tests of supplied parts or appliances that can be satisfactorily inspected on receipt,

- identification of incoming documentation and data relevant to the showing of conformity to be included in the certification documents,

- a vendor rating system which gives confidence in the performance and reliability of this supplier,

- any additional work, tests or inspection which may be needed for parts or appliances which are to be delivered as spare parts and which are not subjected to the checks normally provided by subsequent production or inspection stages.

The POA holder may rely on inspection/tests performed by supplier if it can establish that:

- personnel responsible in charge of these tasks satisfy the competency standards of the POA quality system,

- quality measurements are clearly identified,

- the records or reports showing evidence of conformity are available for review and audit.

The control of suppliers holding a POA for the parts or appliances to be supplied can be reduced, to a level at which a satisfactory interface between the two quality systems can be demonstrated. Thus, for the purpose of showing conformity, a POA holder can rely upon documentation for parts or appliances released under a suppliers HKAR 21.163 privileges.

A supplier who does not hold a POA is considered as a sub-contractor under the direct control of the POA quality system.

The POA holder retains direct responsibility for inspections/tests carried out either at its own facilities or at supplier's facilities.

GM to HKAR 21.139(b)1 Quality System – elements of the quality system

(a) The control procedures covering the elements of HKAR 21.139(b)1 should document the standards to which the production organisation intends to work.

(b) An organisation having a Quality system designed to meet a recognised Standard such as ISO 9001 (relevant to the scope of approval being requested) should expand it to include at least the following additional topics, as appropriate, in order to demonstrate compliance with the requirements of HKAR-21 Subpart G:

- Mandatory Occurrence Reporting and continued airworthiness as required by HKAR 21.165(e)

- Control of work occasionally performed (outside the POA facility by POA personnel)

- Co-ordination with the applicant for, or holder of, an approved design as required by HKAR 21.133(b) and (c) and HKAR 21.165(g)

- Issue of certifications within the scope of approval for the privileges of HKAR 21.163

- Incorporation of airworthiness data in production and inspection data as required in HKAR 21.133(b) and (c) and HKAR 21.145(b)

- When applicable, ground test and/or production flight test of products in accordance with procedures defined by the applicant for, or holder of, the design approval

- Procedures for traceability including a definition of clear criteria of which items need such traceability. Traceability is defined as a means of establishing the origin of an article by reference to historical records for the purpose of providing evidence of conformity

- Personnel training and qualification procedures especially for certifying staff as required in HKAR 21.145(d).

(c) An organisation having a quality system designed to meet a recognised aerospace quality standard will still need to ensure compliance with all the requirements of Subpart G of HKAR-21. In all cases, the Director-General will still need to be satisfied that compliance with HKAR-21Subpart G is established.

GM No. 1 to HKAR 21.139(b)2 Quality System – independent quality assurance function

The quality assurance function which is part of the organisation is required to be independent from the functions being monitored. This required independence relates to the lines of reporting, authority and access within the organisation and assumes an ability to work without technical reliance on the monitored functions.

GM No. 2 to HKAR 21.139(b)2 Quality System – adequacy of procedures and monitoring function

Adequacy of procedures means that the quality system, through the use of the procedures as set forth, is capable of meeting the conformity objectives identified in HKAR 21.139(a).

The quality assurance function to ensure the above should perform planned continuing and systematic evaluations or audits of factors that affect the conformity (and, where required, safe operation) of the products, parts or appliances to the applicable design. This evaluation should include all elements of the quality system in order to demonstrate compliance with HKAR-21 Subpart G.

HKAR 21.143 Exposition

(a) The organisation shall submit to the Director-General a production organisation exposition providing the following information:

1 A statement signed by the accountable manager confirming that the production organisation exposition and any associated manuals which define the approved organisation's compliance with this Subpart will be complied with at all times.

2 The title(s) and names of managers accepted by the Director-General in accordance with HKAR 21.145(c)2.

3 The duties and responsibilities of the manager(s) as required by HKAR 21.145(c)2 including matters on which they may deal directly with the Director-General on behalf of the organisation.

4 An organisational chart showing associated chains of responsibility of the managers as required by HKAR 21.145(c)1 and 2.

5 A list of certifying staff as referred to in HKAR 21.145(d).

6 A general description of man-power resources.

7 A general description of the facilities located at each address specified in the production organisation's certificate of approval.

8 A general description of the production organisation's scope of work relevant to the terms of approval.

9 The procedure for the notification of organisational changes to the Director-General.

10 The amendment procedure for the production organisation exposition.

11 A description of the quality system and the procedures as required by HKAR 21.139(b)1.

12 A list of those outside parties referred to in HKAR 21.139(a).

13 Reserved.

(b) The production organisation exposition shall be amended as necessary to remain an up-to-date description of the organisation, and copies of any amendments shall be supplied to the Director-General.

GM to HKAR 21.143 Exposition – Production Organisation Exposition (POE)

The purpose of the POE is to set forth in a concise document format the organisational relationships, responsibilities, terms of reference, and associated authority, procedures, means and methods of the organisation.

The information to be provided is specified in HKAR 21.143(a). Where this information is documented and integrated in manuals, procedures and instruction, the POE should provide a summary of the information and an appropriate cross-reference.

The Director-General requires the POE to be an accurate definition and description of the production organisation.

When changes to the organisation occur, the POE is required to be kept up to date per a procedure, laid down in the POE. Significant changes to the organisation (as defined in GM to HKAR 21.147(a)) should be approved by the Director-General prior to update of the POE.

GM to HKAR 21.143(a)10 Exposition amendment procedures

The production organisation shall establish the procedures for exposition amendment, such that,

(a) Exposition revision due to any editorial changes, typo corrections, updates on organisational changes already accepted by the Director-General may be approved by the Quality System;
(b) Exposition revision that involves any policy / procedural changes shall be approved by the Director-General;
(c) The exposition approval record (by Quality System or the Director-General) is documented; and
(d) Electronic copy of the exposition new revision shall be submitted to the Director-General for retention.

HKAR 21.145 Approval requirements

The production organisation shall demonstrate, on the basis of the information submitted in accordance with HKAR 21.143 that:

(a) with regard to general approval requirements, facilities, working conditions, equipment and tools, processes and associated materials, number and competence of staff, and general organisation are adequate to discharge obligations under HKAR 21.165.

(b) with regard to all necessary airworthiness, noise, fuel venting and exhaust emissions data:

1 The production organisation is in receipt of such data from the Director-General, and from the holder of, or applicant for, the type certificate or design approval, to determine conformity with the applicable design data.

2 The production organisation has established a procedure to ensure that airworthiness, noise, fuel venting and exhaust emission data are correctly incorporated in its production data.

3 Such data are kept up to date and made available to all personnel who need access to such data to perform their duties.

(c) with regard to management and staff:

1 A manager has been nominated by the production organisation, and is accountable to the Director-General. His or her responsibility within the organisation shall consist of ensuring that all production is performed to the required standards and that the production organisation is continuously in compliance with the data and procedures identified in the exposition referred to in HKAR 21.143.

2 A person or group of persons have been nominated by the production organisation to ensure that the organisation is in compliance with the requirements of HKAR-21, and are identified, together with the extent of their authority. Such person(s) shall act under the direct authority of the accountable manager referred to in subparagraph 1. The persons nominated shall be able to show the appropriate knowledge, background and experience to discharge their responsibilities.

3 Staff at all levels have been given appropriate authority to be able to discharge their allocated responsibilities and that there is full and effective coordination within the production organisation in respect of airworthiness, noise, fuel venting and exhaust emission data matters.

(d) with regard to certifying staff, authorised by the production organisation to sign the documents issued under HKAR 21.163 under the scope or terms of approval:

1 The knowledge, background (including other functions in the organisation), and experience of the certifying staff are appropriate to discharge their allocated responsibilities.

2 The production organisation maintains a record of all certifying staff which shall include details of the scope of their authorisation.

3 Certifying staff are provided with evidence of the scope of their authorisation.

GM to HKAR 21.145(a) Approval requirements

A facility is a working area where the working conditions and the environment are controlled as appropriate in respect of: cleanliness, temperature, humidity, ventilation, lighting, space/access, noise, air pollution.

Equipment and tools should be such as to enable all specified tasks to be accomplished in a repeatable manner without detrimental effect. Calibration control of equipment and tools which affect critical dimensions and values should demonstrate compliance with, and be traceable to, national or international standards.

Sufficient personnel means that the organisation has for each function according to the nature of the work and the production rate, a sufficient quantity of qualified personnel to accomplish all specified manufacturing tasks and to attest the conformity. Their number should be such that airworthiness consideration may be applied in all areas without undue pressure.

An evaluation of the competence of personnel is performed as part of the quality system. This should include, where appropriate, verification that specific qualification standards have been implemented, for example NDT, welding, etc. Training should be organised to establish and maintain the personal competence levels determined by the organisation to be necessary.

GM to HKAR 21.145(b)2 Approval requirements – airworthiness, noise, fuel venting and exhaust emissions /production data procedures

(a) When a POA holder/applicant is developing its own manufacturing data, such as computer based data, from the design data package delivered by a design organisation, procedures are required to demonstrate the right transcription of the original design data.

(b) Procedures are required to define the manner in which airworthiness, noise, fuel venting and exhaust emissions data is used to issue and update the production/quality data, which determines the conformity of products, parts and appliances. The procedure must also define the traceability of such data to each individual product, part or appliance for the purpose of certifying condition for safe operation and issuing a Statement of Conformity or CAD Form One.

GM to HKAR 21.145(c)1 Approval requirements – accountable manager

Accountable manager means the manager who is responsible, and has corporate authority for ensuring that all production work is carried out to the required standard. This function may be carried out by the Chief Executive or by another person in the organisation, nominated by him or her to fulfil the function provided his or her position and authority in the organisation permits to discharge the attached responsibilities.

The manager is responsible for ensuring that all necessary resources are available and properly used in order to produce under the production approval in accordance with HKAR-21 Subpart G.

The manager needs to have sufficient knowledge and authority to enable him or her to respond to the Director-General regarding major issues of the production approval and implement necessary improvements.

The manager needs to be able to demonstrate that he or she is fully aware of and supports the quality policy and maintains adequate links with the quality manager.

GM to HKAR 21.145(c)2 Approval requirements – responsible managers

The person or persons nominated should represent the management structure of the organisation and be responsible for all functions as specified in HKAR-21 Subpart G. It therefore follows that, depending on the size of the HKAR-21 Subpart G organisation, the functions may be subdivided under individual managers (and in fact may be further subdivided) or combined in a variety of ways.

The Director-General requires the nominated managers to be identified and their credentials submitted on a CAD Form Four to the Director-General in order that they may be seen to be appropriate in terms of relevant knowledge and satisfactory experience related to the nature of the production activities as performed by the HKAR-21Subpart G organisation.

The responsibilities and the tasks of each individual manager are required to be clearly defined, in order to prevent uncertainties about the relations, within the organisation. In the case of organisation structures where staff-members are responsible to more than one person, as for instance in matrix and project organisations, responsibilities of the managers should be defined in such a way that all responsibilities are covered.

Where a HKAR-21 Subpart G organisation chooses to appoint managers for all or any combination of the identified HKAR-21 functions because of the size of the undertaking, it is necessary that these managers report ultimately to the accountable manager. In cases where a manager does not directly report to the accountable manager, he or she should have a formally established direct access to the accountable manager.

One such manager, normally known as the quality manager is responsible for monitoring the organisation’s compliance with HKAR-21 Subpart G and requesting remedial action as necessary by the other managers or the accountable manager as appropriate. He or she should have a direct access to the accountable manager.

GM to HKAR 21.145(d) Authorisation of certifying staff

Certifying staff shall be assessed and authorised through the process accepted by the Director-General.

AMC to HKAR 21.145(d)1 Approval requirements – certifying staff

(a) Certifying Staff are nominated by the production organisation to ensure that products, parts, appliances and/or materials qualify for Statements of Conformity or Release Certificates. Certifying Staff positions and numbers are to be appropriate to the complexity of the product and the production rate.

(b) The qualification of certifying staff is based on their knowledge, background and experience and a specific training (or testing) established by the organisation to ensure that it is appropriate to the product, part, or appliance to be released.

(c) Training must be given to develop a satisfactory level of knowledge of organisation procedures, aviation legislation, and associated Hong Kong Aviation Requirements, CS, relevant to the particular role.

(d) For that purpose, in addition to general training policy, the organisation must define its own standards for training, including pre-qualification standards, for personnel to be identified as certifying staff.

(e) Training policy is part of the Quality System and its appropriateness forms part of investigation by the Director-General within the organisation approval process and subsequent surveillance of persons proposed by managers.

(f) The training must be updated in response to experience gained and changes in technology.

(g) A feedback system to ascertain that the required standards are being maintained must be put in place to ensure the continuing compliance of personnel to authorisation requirements.

(h) For release of products, parts or appliances, the responsibilities to issue Statements of Conformity / Release Certificates (CAD Form One) are allocated to the certifying staff identified in HKAR 21.145(d)2.

(i) The Director-General holds the right to reject those personnel, appointed by the organisation, if found to have inappropriate experience or not to otherwise comply with its requirements.

AMC to HKAR 21.145(d)2 Approval Requirements – record of certifying staff

(a) The following is the minimum information to be recorded in respect of each certifying person:

1 Name

2 Date of Birth

3 Basic Training and standard attained

4 Specific Training and standard attained

5 If appropriate – Continuation Training

6 Experience

7 Scope of the authorisation

8 Date of first issue of the authorisation

9 If appropriate – expiry date of the authorisation

10 Identification Number of the authorisation

(b) The record may be kept in any format and must be controlled by an internal procedure of the organisation. This procedure forms part of the quality system.

(c) Persons authorised to access the system must be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner and that confidential records cannot become accessible to unauthorised persons.

(d) The certifying person must be given reasonable access on request to his or her own records.

(e) Under the provision of HKAR 21.157 the Director-General has a right of access to the data held in such a system.

(f) The organisation must keep the record for at least two years after the certifying person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner.

AMC to HKAR 21.145(d)3 Approval requirements – evidence of authorisation

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

(b) Certifying staff are not required to carry the authorisation document at all times but should be able to make it available within a reasonable time of a request from an authorised person. Authorised persons include the Director-General.

HKAR 21.147 Changes to the approved production organisation

(a) After the issue of a production organisation approval, each change to the approved production organisation that is significant to the showing of conformity or to the airworthiness and characteristics of noise, fuel venting and exhaust emissions of the product, part or appliance, particularly changes to the quality system, shall be approved by the Director-General. The Application for Significant Changes or Variation of Scope and Terms of Part 21 Subpart G Production Organisation Approval (DCA 537) shall be submitted to the Director-General and the organisation shall demonstrate to the Director-General before implementation of the change, that it will continue to comply with this Subpart.

(b) The Director-General shall establish the conditions under which a production organisation approved under this Subpart may operate during such changes unless the Director-General determines that the approval should be suspended.

GM to HKAR 21.147(a) Changes to the approved production organisation – significant changes

(a) Changes to be approved by the Director-General include:

- Significant changes to production capacity or methods.

- Changes in the organisation structure especially those parts of the organisation in charge of quality.

- A change of the accountable manager or of any other person nominated under HKAR 21.145(c)2.

- Changes in the production or quality systems that may have an important impact on the conformity/airworthiness of each product, part or appliance.

- Changes in the placement or control of significant sub-contracted work or supplied parts.

(b) To ensure that changes do not result in non-compliance with HKAR-21 Subpart G it is in the interest of both the Director-General and the approval holder to establish a relationship and exchange information that will permit the necessary evaluation work to be conducted before the implementation of a change. This relationship should also permit agreement on the need for variation of the terms of approval (ref HKAR 21.143(a)9).

(c) Where a change of name or ownership results in the issue of a new approval the investigation will normally take account of the Director-General's knowledge and information from the preceding approval.

(d) Changes of location are addressed in HKAR 21.148 and changes of ownership in HKAR 21.149, change of scope of approval in HKAR 21.153.

HKAR 21.148 Changes of location

A change of the location of the manufacturing facilities of the approved production organisation shall be deemed of significance and therefore shall comply with HKAR 21.147.

AMC to HKAR 21.148 Changes of location – management during change of location

(a) The relocation of any work, to an unapproved location, or a location with inappropriate scope of approval, constitutes a change of significance to the organisation and requires approval by the Director-General as prescribed in HKAR 21.147. An unapproved relocation will invalidate the production organisation approval, and may necessitate re-application for any similar approval required at the new location. However, suitable transitional arrangements may be agreed with the Director-General, in advance of the relocation, which can allow continuation of the approval.

(b) When an organisation expands its facility to include a new production location or moves parts of its production to a new location the production organisation approval may continue in force, but the approval does not include the new location until the Director-General has indicated his satisfaction with the arrangements.

(c) For a change in location, taking an extended period of time, suitable transitional arrangements would require preparation of a co-ordination plan for the removal. The plan must, at least, identify the following:

1 A clearly identified person, or group of persons, responsible for coordinating the removal and acting as focal point for communication with all parties, including the Director-General.

2 The basis of the co-ordination plan, e.g., whether by product or area.

3 Planned timing of each phase of relocation.

4 Arrangements for maintaining the standards of the approval up to the point where the production area is closed down.

5 Arrangements for verifying continued production quality upon resumption of work at the new location.

6 Arrangements for check and/or re-calibration of inspection aids or production tools and jigs before resuming production.

7 Procedures which ensure that goods are not released from the new location until their associated production and quality systems have been verified.

8 Arrangements for keeping the Director-General informed of progress with the relocation.

(d) From the co-ordination plan, the Director-General can determine the points at which he wishes to conduct investigation.

(e) If an agreed co-ordination plan is in operation, the Director-General will normally allow the existing approval to remain in force and will, where appropriate, grant an additional approval to cover the new address for the duration of the move.

HKAR 21.149 Transferability

Except as a result of a change in ownership, which is deemed significant for the purposes of HKAR 21.147, a production organisation approval is not transferable.

HKAR 21.151 Terms of approval

The terms of approval shall identify the scope of work, the products or the categories of parts and appliances, or both, for which the holder is entitled to exercise the privileges under HKAR 21.163.

Those terms will be issued as part of a production organisation approval.

GM to HKAR 21.151 Terms of approval – scope and categories

Terms of approval document(s) will be issued by the Director-General under HKAR 21.135 to identify the scope of work, the products, and/or categories for which the holder is entitled to exercise the privileges defined in HKAR 21.163.

The codes shown against each scope of work item are intended for use by the Director-General for purposes such as managing, administering and filing details of approvals. It may also assist in the production and publication of a list of approval holders.

The scope of work, the Products, Parts, or Appliances for which the POA holder is entitled to exercise the privileges defined in HKAR 21.163 will be described by the Director-General as follows:

SCOPE OF WORK	PRODUCTS/CATEGORIES
C1 Appliances:	State appliance generic types (e.g., Tyres, Altimeter, etc.) Examples include: Avionic, Com/Nav/Pulse Computer System, Aircraft/Engine/Avionic Instruments, Mechanical/Electrical/Gyroscopic/Electronic Mechanical/Hydraulic/Pneumatic
C2 Parts:	State part generic types (e.g., Wing, Landing Gear, etc.) Examples include: Structural, Metallic/non-metallic Mechanical/Hydraulic/Pneumatic Electrical Electronic

HKAR 21.153 Changes to the terms of approval

Each change to the terms of approval shall be approved by the Director-General. An application for a change to the terms of approval shall be made in a form and manner established by the Director-General. The applicant shall comply with the applicable requirements of this Subpart.

AMC to HKAR 21.153 Changes to the terms of approval – application for a change to the terms of approval

CAD Form 51 must be completed in accordance with the instructions from the form.

The information entered on the form is the minimum required by the Director-General to assess the need for change of the production organisation approval.

The completed form and an outline of the changed production organisation exposition, and details of the proposed change to POA terms of approval must be forwarded to the Director-General.

HKAR 21.157 Investigations

A production organisation shall make arrangements that allow the Director-General to make any investigations, including investigations of partners and sub-contractors, necessary to determine compliance and continued compliance with the applicable requirements of this Subpart.

GM to HKAR 21.157 Investigations – arrangements

The arrangements made by the applicant for, or holder of an approval under HKAR-21 Subpart G should allow the Director-General to make investigations that include the complete production organisation including partners, sub-contractors and suppliers, whether they are in the State of the applicant or not.

The investigation may include; audits, enquiries, questions, discussions and explanations, monitoring, witnessing, inspections, checks, flight and ground tests and inspection of completed products, parts or appliances produced under the POA.

In order to maintain its confidence in the standards achieved by a POA holder or applicant the Director-General may make an investigation of a sample product part or appliance and its associated records, reports and certifications.

The arrangements should enable the organisation to give positive assistance to the Director-General and co-operate in performing the investigation during both initial assessment and for the subsequent surveillance to maintain the POA.

Co-operation in performing investigation means that the Director-General has been given full and free access to the facilities and to any information relevant to demonstrate compliance to HKAR-21 Subpart G requirements, and assistance (personnel support, records, reports, computer data, etc., as necessary).

Assistance to the Director-General includes all appropriate means associated with the facilities of the production organisation to allow the Director-General to perform these investigations, such as the availability of a meeting room, office and personnel support, documentation and data, and communication facilities, all properly and promptly available as necessary.

The Director-General seeks to have an open relationship with the organisation and suitable liaison personnel should be nominated to facilitate this, including suitable representative(s) to accompany Director-General staff during visits not only at the organisations own facilities but also at sub-contractors, partners or suppliers.

HKAR 21.158 Findings

(a) When objective evidence is found showing non-compliance of the holder of a production organisation approval with the applicable requirements of HKAR-21, the finding shall be classified as follows:

1 a level one finding is any non-compliance with HKAR-21 which could lead to uncontrolled non-compliances with applicable design data and which could affect the safety of the aircraft.

2 a level two finding is any non-compliance with HKAR-21 which is not classified as level one.

(b) An observation is any item where it has been identified, by objective evidence, to contain potential problems that could lead to a non-compliance under paragraph (a).

(c) After receipt of notification of findings/observations:

1 in case of a level one finding, the holder of the production organisation approval shall demonstrate corrective action to the satisfaction of the Director-General within a period of no more than 21 working days after written confirmation of the finding.

2 in case of level two 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 three months. In certain circumstances and subject to the nature of the finding the Director-General may extend the three month period subject to the provision of a satisfactory corrective action plan agreed by the Director-General.

3 an observation shall not require immediate action by the holder of the production organisation approval.

(d) In case of level one or level two findings, the production organisation approval may be subject to a partial or full limitation, suspension or revocation. The holder of the production organisation approval shall provide confirmation of receipt of the notice of limitation, suspension or revocation of the production organisation approval in a timely manner.

GM No. 1 to HKAR 21.158(a) Uncontrolled non-compliance with applicable design data

An uncontrolled non-compliance with applicable design data is a non-compliance:

- that cannot be discovered through systematic analysis; or

- that prevents identification of affected products, parts, appliances, or material.

GM No. 2 to HKAR 21.158(a) Examples of level one findings

Examples of level one findings are non-compliances with any of the following points that could affect the safety of the aircraft:

HKAR 21.139, HKAR 21.145, HKAR 21.147, HKAR 21.148, HKAR 21.151, HKAR 21.163, HKAR 21.165(b), (c), (d), (e), (f) and (g).

It should be anticipated that a non-compliance with these points is only considered a level one finding when objective evidence has been found that this finding is an uncontrolled non-compliance that could affect the safety of the aircraft.

In addition, the failure to arrange for investigations under HKAR 21.157, in particular to obtain access to facilities, after denial of one written request should be classified as a level one finding.

HKAR 21.159 Duration and continued validity

(a) A production organisation approval will be issued for a duration of two years. It shall remain valid unless:

1 the production organisation fails to demonstrate compliance with the applicable requirements of this Subpart; or

2 the Director-General is prevented by the holder or any of its partners or sub-contractors to perform the investigations in accordance with HKAR 21.157; or

3 there is evidence that the production organisation cannot maintain satisfactory control of the manufacture of products, parts or appliances under the approval; or

4 the production organisation no longer meets the requirements of HKAR 21.133; or

5 the certificate has been surrendered or revoked.

(b) Upon surrender or revocation, the certificate shall be returned to the Director-General.

GM to HKAR 21.159(a)3 Evidence of a lack of satisfactory control

A positive finding by the Director-General of:

(a) an uncontrolled non-compliance with type design data affecting the airworthiness of product part or appliance

(b) an incident/accident identified as caused by POA holder

(c) non-compliance with the POE and its associated procedures which could affect conformity of manufactured items to design data

(d) insufficient competence of certifying staff

(e) insufficient resources in respect of facilities, tools and equipment

(f) insufficient means to ensure good production work standards

(g) a lack of effective and timely response to prevent a recurrence of any of point (a) to (f).

HKAR 21.163 Privileges

Pursuant to the terms of approval issued under HKAR 21.135, the holder of a production organisation approval may:

(a) perform production activities under HKAR-21

(b) reserved

(c) in the case of appliances, parts or products other than complete aircraft, issue authorised release certificates (CAD Form One) under HKAR 21.307 without further showing

(d) reserved

(e) reserved

AMC No. 1 to HKAR 21.163(c) Computer generated signature and electronic exchange of CAD Form One

(a) **Submission to the Director-General**

Any POA holder/applicant intending to implement a computer (electronic) generated signature procedure to issue CAD Form One and/or to exchange electronically such data contained on the CAD Form One must document it and submit it to the Director-General as part of the documents attached with its exposition and dealing with the issue of airworthiness certifications.

(b) **Characteristics of the computer generated signature system**

The electronic system must:

- guarantee secure access for each certifying staff;

- ensure integrity and accuracy of the data certified by the signature of the Form and be able to show evidence of the authenticity of the CAD Form One (recording and record keeping) with suitable security, safeguards and backups;

- be active only at the location where the part is being released with a CAD Form One;

- not permit to sign a blank form;

- provide a high degree of assurance that the data has not been modified after signature (if modification is necessary after issuance, i.e. re-certification of a part), a new form with a new number and reference to the initial issuance should be made); and

- provide for a 'personal' electronic signature, identifying the signatory. The signature should be generated only in the presence of the signatory.

An electronic signature means data in electronic form which are attached to or logically associated with other electronic data and which serve as a method of authentication and should meet the following criteria:

- it is uniquely linked to the signatory;

- it is capable of identifying the signatory;

- it is created using means that the signatory can maintain under their sole control.

The electronic signature is defined as an electronically generated value based on a cryptographic algorithm and appended to data in a way to enable the verification of the data's source and integrity.

POA holders / applicants are reminded that additional requirements may need to be satisfied when operating computer generated signature systems.

The electronic system should be based on a policy and management structure (confidentiality, integrity and availability), such as:

- administrators, signatories;

- scope of authorisation, rights;
- password and secure access, authentication, protections, confidentiality;
- track changes;
- minimum blocks to be completed, completeness of information;
- archives;
- etc.

The electronic system generating CAD Form One may contain additional data such as:

- manufacturer code;
- customer identification code;
- workshop report;
- inspection results;
- etc.

(c) **Characteristics of the computer generated signature**

To facilitate understanding and acceptance of the CAD Form One released with an electronic signature, the following statement should be in Block 13b: 'Electronic Signature on File'.

When printing the electronic form, the CAD Form One should meet the general format as found on the CAD website. A watermark-type 'PRINTED FROM ELECTRONIC FILE' should be printed on the document.

When the electronic file contains a hyperlink to data, required to determine the airworthiness of the item(s), the data associated to the hyperlink, when printed, should be in a legible format and be identified as a reference from the CAD Form One.

Additional information not required by the CAD Form One completion instructions may be added to the printed copies of CAD Form One as long as the additional data do not prevent a person from filling out, issuing, printing, or reading any portion of the CAD Form One. This additional data should be provided only in Block 12 unless it is necessary to include it in another block to clarify the content of that block.

AMC No. 2 to HKAR 21.163(c) CAD Form One

For use and instructions for the completion of the Authorised Release Certificate (CAD Form One), refer to the CAD website.

HKAR 21.165 Obligations of the holder

The holder of a production organisation approval shall:

(a) ensure that the production organisation exposition furnished in accordance with HKAR 21.143 and the documents to which it refers, are used as basic working documents within the organisation;

(b) maintain the production organisation in conformity with the data and procedures approved for the production organisation approval;

(c) 1 reserved, or

2 determine that appliances, parts or products other than complete aircraft are complete and conform to the approved design data and are in condition for safe operation before issuing CAD Form One to certify conformity to approved design data and condition for safe operation;

3 reserved, or

4 determine that other products, parts or appliances conform to the applicable data before issuing CAD Form One as a conformity certificate;

(d) record all details of work carried out;

(e) establish and maintain an internal occurrence reporting system in the interest of safety, to enable the collection and assessment of occurrence reports in order to identify adverse trends or to address deficiencies, and to extract reportable occurrences. This system shall include evaluation of relevant information relating to occurrences and the promulgation of related information;

(f) 1 report to the holder of the type certificate or design approval, all cases where products, parts or appliances have been released by the production organisation and subsequently identified to have possible deviations from the applicable design data, and investigate with the holder of the type certificate or design approval in order to identify those deviations which could lead to an unsafe condition;

2 report to the Director-General the deviations which could lead to an unsafe condition identified according to subparagraph 1. Such reports shall be made in a form and manner established by the Director-General under HKAR 21.3A(b)2;

3 where the holder of the production organisation approval is acting as a supplier to another production organisation, report also to that other organisation all cases where it has released products, parts or appliances to that organisation and subsequently identified them to have possible deviations from the applicable design data;

(g) provide assistance to the holder of the type certificate or design approval in dealing with any continuing airworthiness actions that are related to the products, parts or appliances that have been produced;

(h) establish an archiving system incorporating requirements imposed on its partners, suppliers and sub-contractors, ensuring conservation of the data used to justify conformity of the products, parts or appliances. Such data shall be held at the disposal of the Director-General and be retained in order to provide the information necessary to ensure the continuing airworthiness of the products, parts or appliances;

(i) reserved;

(j) reserved;

(k) reserved.

GM to HKAR 21.165(a) Obligations of the holder – basic working document

Compliance with the production organisation exposition (POE) is a prerequisite for obtaining and retaining a production organisation approval.

The organisation should make the POE available to its personnel where necessary for the performance of their duties. A distribution list should therefore be established. Where the POE mainly refers to separate manuals or procedures, the distribution of the POE could be limited.

The organisation should ensure that personnel have access to and are familiar with that part of the content of the POE or the referenced documents, which covers their activities.

Monitoring of compliance with the POE is normally the responsibility of the quality assurance function.

GM No. 1 to HKAR 21.165(c) Obligations of the holder – conformity of prototype models and test specimens

HKAR 21.33 requires determination of conformity of prototype models and test specimens to

the applicable design data. The CAD Form One may be used as a conformity certificate as part of the assistance a POA holder provides to a design approval holder/applicant.

GM No. 2 to HKAR 21.165(c) Obligations of holder – conformity with type design

Individual configurations are often based on the needs of the customer and improvements or changes which may be introduced by the type certificate holder. There are also likely to be unintentional divergencies (concessions or non-conformances) during the manufacturing process. All these changes should have been approved by the design approval holder, or when necessary by the Director-General.

GM No. 3 to HKAR 21.165(c) Obligations of the holder – condition for safe operation

Before issue of the Statement of Conformity to the Director-General, the holder of a production organisation approval should make an investigation so as to be satisfied in respect of each of the items listed below. The documented results of this investigation should be kept on file by the POA holder. Certain of these items may be required to be provided (or made available) to the operator or owner of the aircraft:

(a) Identification of products, parts or appliances which:

1 are not new;

2 are furnished by the buyer or future operator (including those identified in HKAR 21.801 and HKAR 21.805).

(b) Technical records which identify the location and serial numbers of components that have special traceability requirements for continued airworthiness purposes including those identified in HKAR 21.801 and HKAR 21.805.

(c) Log books for products identified in HKAR 21.801 installed as part of the type design as required by the Director-General.

(d) A record of missing items or defects which do not affect airworthiness these for example could be furnishing or BFE (Items may be recorded in a technical log or other suitable arrangement such that the operator and Director-General are formally aware).

(e) Show that inspections for foreign objects at all appropriate stages of manufacture have been satisfactorily performed.

(f) List of all applicable Service Bulletins and airworthiness directives that have been implemented.

GM No. 4 to HKAR 21.165(c) Airworthiness release or conformity certificate

The CAD Form One, when used as a release certificate as addressed in HKAR 21.165(c)2 and 3, may be issued in two ways:

- As an airworthiness release, only when by virtue of the arrangement described in HKAR 21.133(b) and (c), it can be determined that the part conforms to the approved design data and is in a condition for safe operation.

- As a conformity certificate, only when by virtue of the arrangement described in HKAR 21.133(b) and (c), it can be determined that the part conforms to applicable design data which is not (yet) approved, for a reason that is indicated in Block 12. Parts released with a CAD Form One as a conformity certificate are not eligible for installation in a type certificated aircraft.

The CAD Form One should only be used for conformity release purposes when it is possible to indicate the reason that prevents its issue as for airworthiness release purposes.

GM to HKAR 21.165(d) and (h) Obligations of the holder – recording and archiving system

Records within a production environment satisfy two purposes. Firstly, they are required, during the production process to ensure that products, parts, or appliances are in conformity with the controlling data throughout the manufacturing cycle. Secondly, certain records of milestone events are needed to subsequently provide objective evidence that all prescribed stages of the production process have been satisfactorily completed and that compliance with the applicable design data has been achieved.

Therefore, the approved production organisation should implement a system for the compilation and retention of records during all stages of manufacture, covering short-term and long-term records appropriate to the nature of the product and its production processes.

The management of such information should be subject to appropriate procedures in the Quality System required by HKAR 21.139.

All forms of recording media are acceptable (paper, film, magnetic, ...) provided they can meet the required duration for archiving under the conditions provided.

The related organisation procedures should:

- Identify records to be kept.

- Describe the organisation of and responsibility for the archiving system (location, compilation, format) and conditions for access to the information (e.g., by product, subject).

- Control access and provide effective protection from deterioration or accidental damage.

- Ensure continued readability of the records.

- Demonstrate to the Director-General proper functioning of the records system.

- Clearly identify the persons involved in conformity determination.

- Define an archiving period for each type of data taking into account importance in relation to conformity determination subject to the following:

  (a) Data which supports conformity of a product, part, or appliance should be kept for not less than three years from the issue date of the related Statement of Conformity or Authorised Release Certificate.

  (b) Data considered essential for continuing airworthiness should be kept throughout the operational life of the product, part or appliance.

- Ensure that the recording and record-keeping system used by the partners, supplier and sub-contractors meet the objective of conformity of the product, part or appliance with the same level of confidence as for their own manufacture. They should define in each case who is to retain the record data (organisation or partner, supplier or sub-contractor). They should also define method for surveillance of the recording/record keeping system of the partners, suppliers or sub-contractors.

SUBPART H CERIFICATES OF AIRWORTHINESS

HKAR 21.171 Scope

This Subpart establishes the procedure for issuing certificates of airworthiness (C of A).

HKAR 21.172 Eligibility

Subject to Article 4 of the Air Navigation (Hong Kong) Order 1995, any natural or legal person under whose name an aircraft is registered or will be registered in Hong Kong Special Administrative Region (HKSAR), or its representative, shall be eligible as an applicant for a C of A for that aircraft under this Subpart.

HKAR 21.173 Qualification

Before the issue of C of A, the aircraft shall conform to a type certificate that has been issued by the Director-General in accordance with Subpart B.

HKAR 21.174 Application

(a) Pursuant to HKAR 21.172, an application for a C of A shall be made in a form and manner established by the Director-General.

(b) Each application for a C of A shall include:

1 the category of C of A applied for; and

2 with regard to new aircraft:

(i) a statement of conformity signed by the competent authority of the state of manufacture that the aircraft conforms to a design approved by the Director-General;

(ii) a weight and balance report with a loading schedule; and

(iii) the flight manual, when required by the applicable certification specifications for the particular aircraft.

3 with regard to used aircraft:

(i) originating from HKSAR, a C of A issued by the Director-General.

(ii) originating from outside HKSAR:

1. a statement by the competent authority of the State where the aircraft is, or was registered, reflecting the airworthiness status of the aircraft on its register at time of transfer;

2. a weight and balance report with a loading schedule;

3. the flight manual when such a manual is required by the applicable certification specification for the aircraft; and

4. historical records to establish the production, modification, and maintenance standard of the aircraft, including all limitations associated with the certificate of airworthiness.

4 aircraft certification documents specified by the Director-General; and

5 a recommendation for the issuance of a C of A issued by an organisation approved under HKAR-183, unless aircraft is being transferred within Hong Kong registry; and the category is the same or being downgraded; and the new operator has the same type of aircraft registered in Hong Kong under its management; or otherwise accepted by the Director-General.

(c) Unless otherwise agreed, the statements referred to in subparagraphs (b)2(i) and (b)3(ii)1 shall be issued no more than 60 days before presentation of the aircraft to the Director-General.

GM to HKAR 21.174(a) Application form and manner

(a) **Application form**

CAD Form DCA 46D shall be completed and submitted to the Director-General.

(b) **Timeline**

The applicant shall submit the completed application 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.

GM to HKAR 21.174(b)2(i) Statement of conformity

(a) The statement declaring that the aircraft conforms to a design approved by the Director-General shall be accompanied by the C of A or Export C of A issued by the State of Manufacture.

(b) During the investigation, the Director-General may decide that additional requirements must be met and these will be published as Additional Requirements for Issue of C of A in writing to the applicant.

GM to HKAR 21.174(b)2(iii) Flight manual

(a) The applicant shall submit to the Director-General a Flight Manual conforming to Hong Kong requirements including an index showing the applicable flight manual supplements for the particular aircraft.

(b) Maximum Approved Passenger Seating Configuration (MAPSC) is the maximum passenger seating capacity of an individual aircraft, excluding pilot seats or flight deck seats and cabin crew seats as applicable, approved by the Director-General and specified in the C of A. 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 Layout of Passenger Accommodation (LOPA) as part of the MAPSC presentation in the Flight Manual or its supplement.

GM to HKAR 21.174(b)3(ii)1 Statement reflecting airworthiness status

(a) The statement reflecting the airworthiness status shall be accompanied by the C of A or Export C of A issued by the State where the aircraft is registered.

(b) During the investigation, the Director-General may decide that additional requirements must be met and these will be published as Additional Requirements for Issue of Certificate of Airworthiness in writing to the applicant.

GM to HKAR 21.174(b)3(ii)3 Flight manual

Refer to GM to HKAR 21.174(b)2(iii).

GM to HKAR 21.174(b)4 Aircraft certification documents

The aircraft certification documents are specified in Hong Kong Airworthiness Notice No. 17A.

HKAR 21.175 Language

The manuals, placards, listings, instrument markings and other necessary information, required by applicable certification specifications and Hong Kong regulations and requirements, shall be presented in the English language and supplemented by the Chinese language as agreed by the Director-General.

HKAR 21.177 Amendment or modification

A C of A may be amended or modified only by the Director-General.

HKAR 21.179 Transferability and re-issuance within HKSAR

(a) Where the registered ownership of an aircraft has changed:

1 a new C of A shall be applied.

2 reserved.

(b) Reserved.

HKAR 21.180 Inspections

Each applicant for, or the holder of the C of A shall provide access to the aircraft for which that C of A has been applied for or issued respectively upon request by the Director-General.

HKAR 21.181 Duration and continued validity

(a) A C of A is normally issued with a validity of 12 months. In reference to Article 8(7) of the Air Navigation (Hong Kong) Order 1995, it shall remain valid subject to:

1 the aircraft in compliance with the applicable type-design and continuing airworthiness requirements; and

2 the aircraft remaining on the same registered owner; and

3 the type certificate under which it is issued not being previously invalidated under HKAR 21.51; and

4 the C of A not being surrendered or revoked.

(b) Upon surrender or revocation, the C of A shall be returned to the Director-General.

(c) Upon re-issuance, the previously issued certificate shall be returned to the Director-General.

HKAR 21.182 Aircraft identification

Each applicant for a C of A under this Subpart shall demonstrate that its aircraft is identified in accordance with HKAR 21.801.

SUBPART I NOISE CERTIFICATES

HKAR 21.201 Scope

This Subpart establishes the procedure for issuing noise certificates.

HKAR 21.203 Eligibility

Any natural or legal person under whose name an aircraft is registered or will be registered in Hong Kong Special Administrative Region, or its representative, shall be eligible as an applicant for a noise certificate for that aircraft under this Subpart.

HKAR 21.204 Application

(a) Pursuant to HKAR 21.203, an application for a noise certificate shall be made in a form and manner established by the Director-General.

(b) Each application shall include:

1 with regard to new aircraft:

(i) A statement of conformity signed by the exporting authority that the aircraft conforms to a design approved by the Director-General; and

(ii) The noise information determined in accordance with the applicable noise requirements.

2 with regard to used aircraft :

(i) The noise information determined in accordance with the applicable noise requirements; and

(ii) Historical records to establish the production, modification, and maintenance standard of the aircraft.

(c) Unless otherwise agreed, the statements referred to in subparagraph (b)1(i) shall be issued no more than 60 days before presentation of the aircraft to the Director-General.

(d) Each application for the initial issuance of a noise certificate shall be verified by an organisation approved under HKAR-183.

GM to HKAR 21.204(a) Application

(a) An application for a Noise Certificate shall be made to the Director-General using form DCA 300, normally at the same time when applying for issuance of Certificate of Airworthiness. The form is available on the Hong Kong Civil Aviation Department website. The application shall be accompanied by:

1 a deposit cheque for charges prescribed in the Civil Aviation (Aircraft Noise) (Certification) Regulations at the time of application;

2 any documents upon which the applicant relies to show that the aircraft complies with the relevant standards of noise; and

3 such other evidence in support of the application as the Director-General may reasonably require for the consideration of the application.

(b) The applicant shall provide evidence showing that the aircraft complies with requirements specified in HKAR 21.18(a). Noise data with numerical values approved by the primary certification authority is acceptable to the Director-General.

(c) Noise data determined by reading from chart is not acceptable.

GM to HKAR 21.204(b) Noise requirements

For details of the requirements, refer to ICAO Annex 16 Volume I.

Item #	Chapter	Section	Aircraft Type	Maximum Certificated Take-off Mass	Type Certificate Application Date
A	2	2.4.1	Subsonic jet aeroplanes		Before 6 October 1977
B	2	2.4.2	Subsonic jet aeroplanes		Before 6 October 1977 with derived versions for which the application for certification of the change in type design was submitted on or after 26 November 1981
D	3		Subsonic jet aeroplanes		On or after 6 October 1977 and before 1 January 2006
E	3		Propeller-driven aeroplanes	Over 8,618 kg	On or after 1 January 1985 and before 1 January 2006
F	4		Subsonic jet aeroplanes and propeller-driven aeroplanes	55,000 kg and over	On or after 1 January 2006 and before 31 December 2017
G	4		Subsonic jet aeroplanes	Less than 55,000 kg	On or after 1 January 2006 and before 31 December 2020
H	4		Propeller-driven aeroplanes	Over 8,618 kg and less than 55,000 kg	On or after 1 January 2006 and before 31 December 2020

Item #	Chapter	Section	Aircraft Type	Maximum Certificated Take-off Mass	Type Certificate Application Date
I	5		Propeller-driven aeroplanes	Over 8,618 kg	Before 1 January 1985
J	6		Propeller-driven aeroplanes	Not exceeding 8,618 kg	Before 17 November 1988
K	7		Propeller-driven STOL aeroplanes		
L	8	8.4.1	Helicopters		On or after 1 January 1985
M	8	8.4.1	Helicopters		On or after 1 January 1985 with a derived version of a helicopter for which the application for certification of the change in type design was submitted on or after 17 November 1988
N	8	8.4.2	Helicopters		For all helicopters, including their derived versions, for which the application for the type certificate was submitted on or after 21 March 2002
O	9		Installed auxiliary power units (APU) and associated aircraft systems during ground operations		
P	10	10.4 a)	Propeller-driven aeroplanes	Not exceeding 8,618 kg	Application for type certificate or certification of derived version submitted on or after 17 November 1988
Q	10	10.4 a)	Propeller-driven single-engined aeroplanes, except float planes and amphibians	Not exceeding 8,618 kg	Apply to those derived versions of aeroplanes for which the application for the type certificate was submitted on or after 17 November 1988 and before 4 November 1999, and where the application for certification of change in type design was submitted on or after 4 November 1999 and before 4 November 2004 and which exceed the maximum noise levels of paragraph 10.4 b) of ICAO Annex 16, Vol. I, Chapter 10
R	10	10.4 b)	Propeller-driven single-engined aeroplanes, except float planes and amphibians	Not exceeding 8,618 kg	On or after 4 November 1999
S	10	10.4 b)	Propeller-driven single-engined aeroplanes, except float planes and amphibians	Not exceeding 8,618 kg	Apply to those derived versions of aeroplanes for which the application for the type certificate was submitted before 4 November 1999 and for which the application for certification of the change in type design was submitted on or after 4 November 1999

Item #	Chapter	Section	Aircraft Type	Maximum Certificated Take-off Mass	Type Certificate Application Date
T	11	11.4.1	Helicopters	Not exceeding 3,175 kg	Except for those helicopters specified in Item U, (i) all helicopters for which the application for the type certificate was submitted on or after 11 November 1993; (ii) for a derived version of a helicopter for which the application for certification of the change in type design was submitted on or after 11 November 1993.
U	11	11.4.2	Helicopters	Not exceeding 3,175 kg	All helicopters, including their derived versions, for which the application for the type certificate was submitted on or after 21 March 2002
V	12		Supersonic aeroplanes		
W	13		Tilt-rotors		
X	14		Subsonic jet aeroplanes and propeller-driven aeroplanes	55,000 kg and over	On or after 31 December 2017
Y	14		Subsonic jet aeroplanes	Less than 55,000 kg	On or after 31 December 2020
Z	14		Propeller-driven aeroplanes	Over 8,618 kg and less than 55,000 kg	On or after 31 December 2020

HKAR 21.207 Amendment or modification

A noise certificate may be amended or modified only by the Director-General.

HKAR 21.209 Transferability and re-issuance within HKSAR

Where the registered ownership of an aircraft has changed:

(a) If the aircraft remains on the same register, the noise certificate shall be transferred together with the aircraft.

(b) Reserved.

HKAR 21.210 Inspections

Each applicant for, or the holder of the noise certificate shall provide access to the aircraft for which that noise certificate has been applied for or issued respectively upon request by the Director-General for inspection.

HKAR 21.211 Duration and continued validity

(a) A noise certificate shall be issued for an unlimited duration. It shall remain valid subject to:

1 the aircraft in compliance with the applicable type-design, environmental protection and continuing airworthiness requirements; and

2 the aircraft remaining on the same register; and

3 the type certificate under which it is issued not being previously invalidated under HKAR 21.51; and

4 the certificate not being surrendered or revoked.

(b) Upon surrender or revocation, the certificate shall be returned to the Director-General.

SUBPART J DESIGN ORGANISATION APPROVAL

HKAR 21.231 Scope

This Subpart establishes the procedure for the approval of design organisations and rules governing the rights and obligations of applicants for, and holders of, such approvals.

HKAR 21.233 Eligibility

Any natural or legal person ('organisation') shall be eligible as an applicant for an approval under this Subpart:

(a) In accordance with HKAR 21.14, HKAR 21.112B, HKAR 21.432B or HKAR 21.602B; or

(b) For approval of minor changes or minor repair design, when requested for the purpose of obtaining privileges under HKAR 21.263.

HKAR 21.234 Application

Each application for a design organisation approval shall be made in a form and manner established by the Director-General and shall include an outline of the information required by HKAR 21.243, and the terms of approval requested to be issued under HKAR 21.251.

GM to HKAR 21.234 Form and manner

The applicant should file an application using application forms ‘Application for Design Organisation Approval’ DCA 531 (CAD Form 80). This form is available from the CAD website.

The form should be completed in accordance with the instructions of the application form.

HKAR 21.235 Issue of design organisation approval

An organisation shall be entitled to have a design organisation approval issued by the Director-General when it has demonstrated compliance with the applicable requirements under this Subpart.

HKAR 21.239 Design assurance system

(a) The design organisation shall demonstrate that it has established and is able to maintain a design assurance system for the control and supervision of the design, and of design changes, of products, parts and appliances covered by the application. This design assurance system shall be such as to enable the organisation:

1 to ensure that the design of the products, parts and appliances or the design change thereof, comply with the applicable type certification basis, the applicable operational suitability data certification basis and environmental protection requirements; and

2 to ensure that its responsibilities are properly discharged in accordance with:

(i) the appropriate provisions of HKAR-21; and

(ii) the terms of approval issued under HKAR 21.251; and

3 to independently monitor the compliance with, and adequacy of, the documented procedures of the system. This monitoring shall include a feed-back system to a person or a group of persons having the responsibility to ensure corrective actions.

(b) The design assurance system shall include an independent checking function of the showings of compliance on the basis of which the organisation submits compliance statements and associated documentation to the Director-General.

(c) The design organisation shall specify the manner in which the design assurance system accounts for the acceptability of the parts or appliances designed or the tasks performed by partners or sub-contractors according to methods which are the subject of written procedures.

GM No. 1 to HKAR 21.239(a) Design assurance system

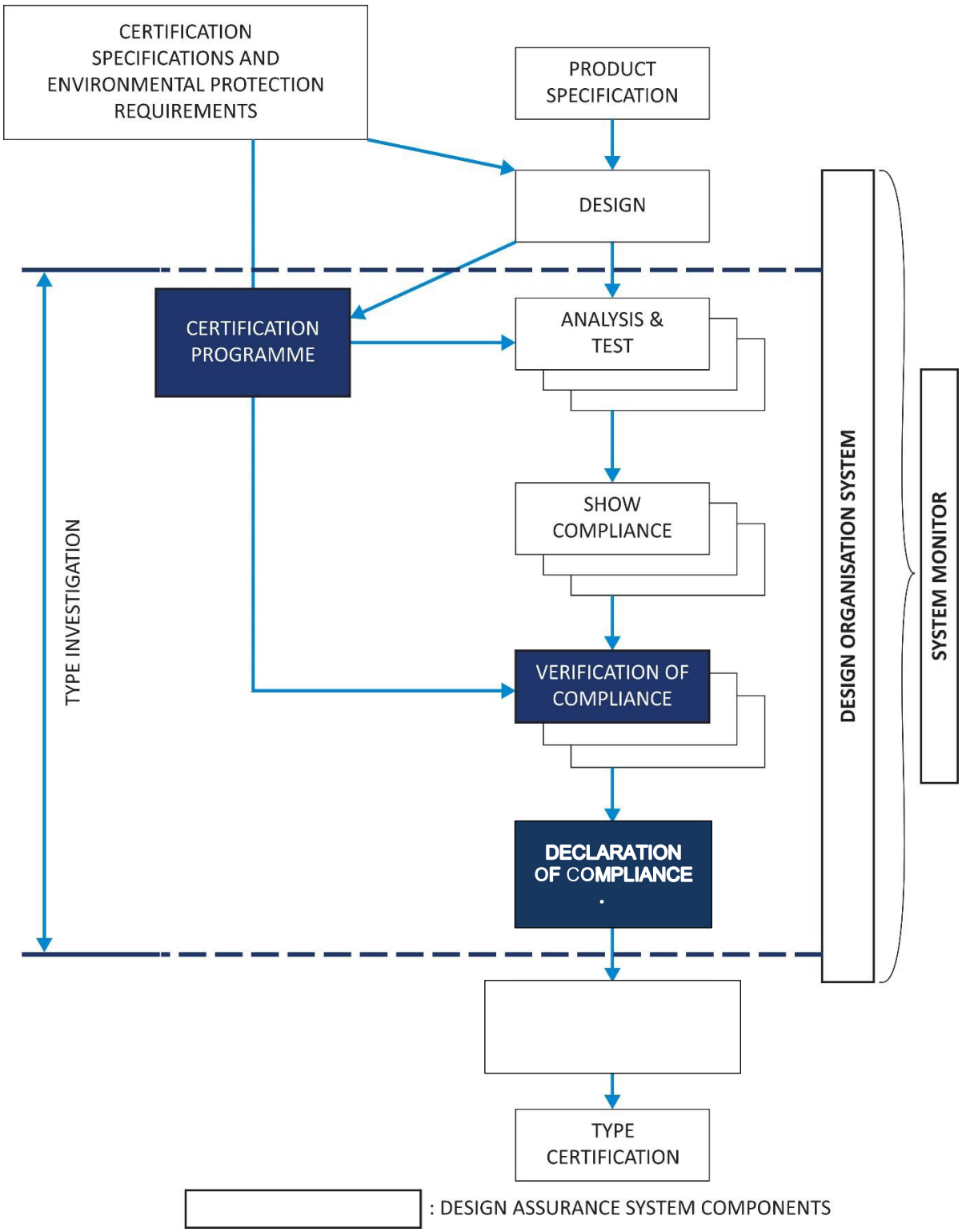


Figure 1

1 Purpose

This GM outlines some basic principles and objectives of HKAR 21.239(a).

2 Definitions

2.1 The design assurance system is the organisational structure, responsibilities, procedures and resources to ensure the proper functioning of the design organisation.

2.2 The design assurance means all those planned and systematic actions necessary to provide adequate confidence that the organisation has the capability:

- to design products or parts in accordance with the applicable certification specifications, environmental protection requirements and Hong Kong airworthiness requirement;

- to demonstrate and verify the compliance with these certification specifications, environmental protection requirements and Hong Kong airworthiness requirements; and

- to demonstrate to the Director-General this compliance.

2.3 The 'Type Investigation' means the tasks of the organisation in support of the type certificate, supplemental type certificate or other design approval processes necessary to demonstrate and verify and to maintain compliance with the applicable certification specifications, environmental protection requirements and Hong Kong airworthiness requirements.

3 Design Assurance

The complete process, starting with the certification specifications, environmental protection requirements, Hong Kong airworthiness requirements, product specifications and culminating with the issuing of a type certificate, is shown in the diagram on Figure 1. This identifies the relationship between the design, the Type Investigation and design assurance processes.

Effective design assurance demands a continuing evaluation of factors that affect the adequacy of the design for intended applications, in particular that the product, or part, complies with applicable certification specifications, environmental protection requirements and Hong Kong airworthiness requirements and will continue to comply after any change.

Two main aspects should therefore be considered:

- How the planned and systematic actions are defined and implemented, from the very beginning of design activities up to continued airworthiness activities; and

- How these actions are regularly evaluated and corrective actions implemented as necessary.

3.1 Planned and Systematic Actions

For design organisations carrying out Type Investigation of products, the planned and systematic actions should cover the following tasks and procedures should be defined accordingly:

3.1.1 General

(a) To issue or, where applicable, supplement or amend the handbook in accordance with HKAR 21.243, in particular to indicate the initiation of design activities on a product.

(b) To assure that all instructions of the Handbook are adhered to.

(c) To conduct Type Investigation.

(d) To assess and nominate staff as 'compliance verification engineers' responsible to approve compliance documents as defined in paragraph 3.1.3, through a process accepted by the Director-General.

(e) To assess and authorise design personnel belonging to the Office of Airworthiness responsible as defined in paragraph 3.1.4, through a process accepted by the Director-General.

(f) In the case of an applicant for a supplemental type certificate, to obtain the agreement of the type certificate holder for the proposed supplemental type certificate to the extent defined in HKAR 21.115.

(g) To ensure full and complete liaison between the type design organisation and related organisations having responsibility for products manufactured to the type certificate.

(h) To provide the assurance to the Director General that prototype models and test specimens adequately conform to the type design (see HKAR 21.33(b)1).

3.1.2 Chief Executive and Head of Design Organisation (or his or her Deputy)

(a) The Chief Executive should provide the necessary resources for the proper functioning of the design organisation.

(b) The Head of the design organisation, or an authorised representative, should sign a declaration of compliance (see HKAR 21.20(d)) with the applicable certification specifications, environmental protection requirements and Hong Kong airworthiness requirements after verification of satisfactory completion of the Type Investigation. In accordance with HKAR 21.20(e), his or her signature on the declaration of compliance confirms that the procedures as specified in the handbook have been followed (see also GM to HKAR 21.265(b)).

(c) The functions of Chief Executive and Head of the design organisation may be performed by the same person.

3.1.3 Compliance Verification

(a) Approval by signing of the compliance documents necessary for the verification of compliance with the applicable certification specifications, environmental protection requirements and Hong Kong airworthiness requirements as defined in the certification programme.

(b) Verify of the technical content (completeness, technical accuracy...), including any subsequent revisions, of the manuals approved by the Director-General.

3.1.4 Office of Airworthiness

(a) Liaison between the design organisation and the Director-General with respect to all aspects of the certification programme.

(b) Ensuring that a handbook is prepared and updated as required in HKAR 21.243.

(c) Co-operation with the Director-General in developing procedures to be used for the type certification process.

(d) Issuing of guidelines for documenting compliance.

(e) Co-operation in issuing guidelines for the preparation of the manuals required by the applicable implementing rules, Service Bulletins, drawings, specifications, and standards.

(f) Ensuring procurement and distribution of applicable certification specifications, environmental protection requirements, Hong Kong airworthiness requirements and other specifications.

(g) Co-operating with the Director-General in proposing the type certification basis

(h) Interpretation of certification specifications, environmental protection requirements, Hong Kong airworthiness requirements and requesting decisions of the Director-General in case of doubt.

(i) Advising of all departments of the design organisation in all questions regarding airworthiness, operational suitability, environmental protection approvals and certification.

(j) Preparation of the certification programme and co-ordination of all tasks related to Type Investigation in concurrence with the Director-General.

(k) Regular reporting to the Director-General about Type Investigation progress and announcement of scheduled tests in due time.

(l) Ensuring co-operation in preparing inspection and test programmes needed for demonstration of compliance.

(m) Establishing the compliance checklist and updating for changes.

(n) Checking that all compliance documents are prepared as necessary to demonstrate compliance with all certification specifications, environmental protection requirements and Hong Kong airworthiness requirements, as well as for completeness, and signing for release of the documents.

(o) Checking the required type design definition documents described in HKAR 21.31 and ensuring that they are provided to the Director-General for approval when required.

(p) Reserved.

(q) Providing verification to the head of the design organisation that all activities required for Type Investigation have been properly completed.

(r) Approving the classification of changes in accordance with HKAR 21.91 and granting the approval for minor changes in accordance with HKAR 21.95(b).

(s) Monitoring of significant events on other aeronautical products as far as relevant to determine their effect on airworthiness or operational suitability of products being designed by the design organisation.

(t) Ensuring co-operation in preparing instructions for the embodiment/installation of the change and subsequent revisions, with special attention being given to the manner in which the contents affect airworthiness and environmental protection and granting the approval on behalf of the Director-General.

(u) Ensuring the initiation of activities as a response to a failure (accident/incident/in-service occurrence) evaluation and complaints from the operation and providing of information to the Director-General in case of airworthiness or operational suitability impairment (continuing airworthiness and continued operational suitability).

(v) Advising the Director-General with regard to the issue of airworthiness directives in general based on Service Bulletins.

(w) Ensuring that the manuals approved by the Director-General, including any subsequent revisions (the Aircraft Flight Manual, MMEL, the Airworthiness Limitations section of the Instructions for Continued Airworthiness and the Certification Maintenance Requirements (CMR) document, where applicable) are checked to determine that they meet the respective requirements, and that they are provided to the Director-General for approval.

3.1.5 Maintenance and Operating Instructions

(a) Ensuring the preparation and updating of all maintenance and operating instructions (including instructions for continued airworthiness and services bulletins) needed to maintain airworthiness (continuing airworthiness) in accordance with relevant certification specifications and Hong Kong airworthiness requirements.

(b) In accordance with HKAR 21.57, HKAR 21.61, HKAR 21.107, HKAR 21.119, HKAR 21.120A and HKAR 21.449, ensuring that these documents are provided to all affected operators and all involved authorities.

3.1.6 Operational Suitability Data

(a) Ensuring the preparation and updating of all operational suitability data in accordance with relevant certification specifications and Hong Kong requirements. For that purpose, the applicant should:

- establish the list of all documents it is producing to comply with CS-MMEL or CS-GEN-MMEL, CS-FCD, CS-CCD, CS-SIMD and CS-MCSD (or equivalent) as applicable; and

- define procedures and organisation to produce and issue these documents under the obligation of HKAR 21.265(h); these procedures should cover the aspects described in para 3.1.5(b) above.

(b) In accordance with HKAR 21.57, HKAR 21.62, HKAR 21.108, HKAR 21.119 and HKAR 21.120B, ensuring that these documents are provided to all affected operators and training organisations and all involved authorities.

3.2 Continued effectiveness of the design assurance system. The organisation should establish the means by which the continuing evaluation (system monitoring) of the design assurance system will be performed in order to ensure that it remains effective.

GM No. 2 to HKAR 21.239(a) Design assurance system for minor changes to type design or minor repairs to products

(a) **Purpose**

This GM outlines some basic principles and objectives in order to comply with HKAR 21.239(a) for organisations designing only minor changes to type design or minor repairs to products.

(b) **Design assurance system**

The design assurance system should include the following:

- an organisational structure to:

  - control the design

  - demonstrate compliance with applicable certification specifications, environmental protection requirements and Hong Kong airworthiness requirements

- assess staff nominated as 'compliance verification engineers' responsible to approve compliance documents, through a process accepted by the Director-General
- independently check demonstrations of compliance
- liaise with the Director-General
- continuously evaluate the design organisation
- control sub-contractors

- procedures and responsibilities associated with the functions listed above, taking due account of HKAR-21 requirements applicable to design and approval of minor changes to type design or minor repairs to products.

AMC to HKAR 21.239(a)3 Design assurance system - independent system monitoring

The system monitoring function required by HKAR 21.239(a)3 may be undertaken by the existing quality assurance organisation when the design organisation is part of a larger organisation.

AMC to HKAR 21.239(b) Design assurance system - independent checking function of the demonstration of compliance

(a) The independent checking function of the demonstration of compliance should consist of the verification by a person not creating the compliance data. Such person may work in conjunction with the individuals who prepare compliance data.

(b) The verification should be shown by signing compliance documents, including test programmes and data.

(c) For a product, there is normally only one compliance verification engineer nominated for each relevant subject. A procedure should cover the non-availability of nominated persons and their replacement when necessary.

(d) For STC cases, when compliance statement and associated documentation are produced by the TC holder, and when these data are approved under the system of the authority of TC holder, then the STC applicant does not need to provide, within its own DOA, the independent checking function required in HKAR 21.239(b) for these data.

GM to HKAR 21.239(c) Design assurance system

In meeting the requirements of HKAR 21.239(c) the applicant for a design organisation approval under Subpart J may adopt the following policy:

(a) The satisfactory integration of the Partner/Sub-contractor and applicant's design assurance systems should be demonstrated for the activities covered under the applicant's terms of approval.

(b) In the event that a Partner/Sub-contractor holds a design organisation approval (DOA), then in accordance with HKAR 21.239(c), the applicant may take this into account in demonstrating the effectiveness of this integrated system.

(c) When any Partner/Sub-contractor does not hold a DOA then the applicant will need to establish to its own satisfaction and the satisfaction of the Director-General, the adequacy of that partner's/sub-contractor's design assurance system in accordance with HKAR 21.243(b).

HKAR 21.243 Data

(a) The design organisation shall furnish a handbook to the Director-General describing, directly or by cross-reference, the organisation, the relevant procedures and the products or changes to products to be designed. If flight tests are to be conducted, the procedures defining the organisation's policies and procedures in relation to flight test shall be furnished in the handbook, which shall include:

1 a description of the organisation's processes for flight test, including the flight test organisation involvement into the permit to fly issuance process;

2 reserved;

3 procedures for the carriage of persons other than crew members and for flight test training, when applicable;

4 a policy for risk and safety management and associated methodologies;

5 procedures to identify the instruments and equipment to be carried;

6 a list of documents that need to be produced for flight test; and

7 the procedures for establishing the flight test arrangement between the design organisation and the flight test organisation.

(b) Where any parts or appliances or any changes to the products are designed by partner organisations or sub-contractors, the handbook shall include a statement of how the design organisation is able to give, for all parts and appliances, the assurance of compliance required by HKAR 21.239(b), and shall contain, directly or by cross-reference, descriptions and information on the design activities and organisation of those partners or sub-contractors, as necessary to establish this statement.

(c) The handbook shall be amended as necessary to remain an up-to-date description of the organisation, and copies of amendments shall be supplied to the Director-General.

(d) The design organisation shall furnish a statement of the qualifications and experience of the management staff and other persons responsible for making decisions affecting airworthiness and environmental protection in the organisation.

AMC No. 1 to HKAR 21.243(a) Data

HANDBOOK CONTENT

The handbook should provide the following information for each product covered by the design organisation approval.

(a) A description of the tasks which can be performed under the approval, according to the following classification:

1 general areas, like subsonic turbojet aeroplanes, turbopropeller aeroplanes, small aeroplanes, rotorcraft;

2 technologies handled by the organisation (composite, wood or metallic construction, electronic systems, etc.);

3 a list of types and models for which the design approval has been granted and for which privileges may be exercised, supported by a brief description for each product; and

4 for repair design, classification and (if appropriate) approval activities it is necessary to specify the scope of activity in terms of structures, systems, engines, etc.

(b) A general description of the organisation, its main departments, their functions and the names of those in charge; a description of the line management and of functional relationships between the various departments.

(c) A description of assigned responsibilities and delegated authority of all parts of the organisation which, taken together, constitute the organisation's design assurance system together with a chart indicating the functional and hierarchical relationship of

the design assurance system to Management and to other parts of the organisation; also the chains of responsibilities within the design assurance system, and the control of the work of all partners and sub-contractors.

(d) A general description of the way in which the organisation performs all the design functions in relation to airworthiness, operational suitability and environmental protection approvals including:

1 the procedures followed and forms used in the type investigation process to ensure that the design of, or the change to the design of, the product as applicable is identified and documented, and complies with the applicable certification specifications, environmental protection requirements and Hong Kong airworthiness requirements, including specific requirements for import by importing authorities;

2 the procedures for classifying design changes as "major" or "minor" and for the approval of minor changes;

3 the procedures for classifying and approving unintentional deviations from the approved design data occurring in production (concessions or non-conformance's); and

4 the procedure for classifying and obtaining approval for repairs.

(e) A general description of the way in which the organisation performs its functions in relation to the continuing airworthiness and continued operational suitability of the product it designs, including co-operation with the production organisation when dealing with any continuing airworthiness actions that are related to production of the product, part or appliance, as applicable.

(f) A description of the human resources, facilities and equipment, which constitutes the means for design, and where appropriate, for ground and flight testing.

(g) An outline of a system for controlling and informing the staff of the organisation of current changes in engineering drawings, specifications and design assurance procedures.

(h) A description of the recording system for:

1 the type design, including relevant design information, drawings and test reports, including inspection records of test specimen;

2 the means of compliance; and

3 the compliance documentation (compliance check list, reports...).

(i) A description of the record keeping system to comply with HKAR 21.55 and HKAR 21.105.

(j) A description of the means by which the organisation collects, monitors, analyses and responds to reports of problems which cause or might cause an adverse effect on the airworthiness or operational suitability of its product, part or appliance during design, production and in service, in particular to comply with HKAR 21.3A (see also GM No. 1 to HKAR 21.239(a), paragraphs 3.1.4(s) and (u)). These collected reports should include both mandatory and voluntary occurrence reports from organisations and natural persons involved in the operation and maintenance of the product, part or appliance.

(k) The names of the design organisation authorised signatories. Nominated persons with specific responsibilities such as mentioned in HKAR 21.33 and HKAR 21.35 should be listed.

(l) Reserved.

(m) A clear definition of the tasks, competence and areas of responsibility of the Office of Airworthiness.

(n) A description of the procedures for the establishment and the control of the maintenance and operating instructions (see HKAR 21.57, HKAR 21.61, HKAR 21.107, HKAR 21.119, HKAR 21.120A and HKAR 21.449).

(o) A description of the means by which the continuing evaluation (system monitoring) of the design assurance system will be performed in order to ensure that it remains effective.

(p) A description of the procedures for the establishment and the control of the operational suitability data (see HKAR 21.57 and HKAR 21.119).

AMC No. 2 to HKAR 21.243(a) Data requirements - model content of handbook for organisations designing minor changes to type design or minor repairs to products

Part 1 Organisation

1.1 Objective of handbook and binding statement

1.2 Responsible person for administration of handbook

1.3 Amendment procedure

1.4 List of effective pages

1.5 Distribution list

1.6 Presentation of design organisation (including locations)

1.7 Scope of work (with identification of type and models of products)

1.8 Organisation charts

1.9 Human resources

1.10 Management staff

1.11 Certifying personnel (see GM No. 2 to HKAR 21.243(d), paragraph (b))

1.12 Independent system monitoring

Part 2 Procedures

1.1 Management of changes to type design and design of repairs

- configuration control
- classification
- approval of minor changes to type design and minor repairs

1.2 Control of design sub-contractors

1.3 Collecting/investigating of failures, malfunctions and defects

1.4 Co-ordination with production

1.5 Documentation control

- in relations with the changes and repairs
- in relation with failures/malfunctions and defects (i.e. Services - Bulletins)

1.6 Record keeping

GM to HKAR 21.243(c) Handbook amendment procedures

The design organisation shall establish the procedures for handbook amendment, such that,

(a) Handbook revision due to any editorial changes, typo corrections, updates on organisational changes already accepted by the Director-General may be approved by the Design Assurance System;

(b) Handbook revision that involves any policy / procedural changes shall be approved by the Director-General;

(c) The handbook approval record (by Design Assurance System or the Director-General) is documented; and

(d) Electronic copy of the handbook new revision shall be submitted to the Director-General for retention.

GM No. 1 to HKAR 21.243(d) Statement of qualifications and experience

(a) **Purpose**

This GM provides guidelines on the following points:

- Who are the persons covered by HKAR 21.243(d)?
- What is requested from the applicant for these persons?

(b) **Who are the persons?**

Three different types of functions are named or implicitly identified in the requirements of HKAR-21 Subpart J or in associated AMC and GM, using qualified and experienced personnel:

- the Chief Executive [see GM No. 1 to HKAR 21.239(a), para. 3.1.2, GM to HKAR 21.265(b)]; and
- the other management staff:
  - the Head of the Design Organisation [see GM No. 1 to HKAR 21.239(a), para. 3.1.2, GM to HKAR 21.245, paragraph(d)1, GM to HKAR 21.265(b)];
  - the Chief of the Office of Airworthiness, or [see GM to HKAR 21.245, paragraph (d)2]; and

- the Chief of the Independent Monitoring function of the design assurance system [see HKAR 21.239(a)(3) and AMC No. 1 to HKAR 21.243(a), paragraph (b)]; and

- the personnel making decisions affecting airworthiness, operational suitability and environmental protection:

  - compliance verification engineers [see GM No. 1 to HKAR 21.239(a), para.3.1.3; AMC to HKAR 21.239(b)]; and

  - personnel of the Office of Airworthiness making decisions affecting airworthiness, operational suitability and environmental protection, especially those linked with the HKAR 21.263 privileges (signing documents for release, approving classification of changes and repairs, and granting the approval of minor changes and minor repairs, granting the approval of SBs, and minor revisions to the aircraft flight manual) [see GM No. 1 to HKAR 21.239(a), para. 3.1.4].

(c) **Kind of statement**

1 Chief Executive

The Chief Executive should provide the necessary resources for the proper functioning of the design organisation.

A statement of the qualification and experience of the Chief Executive is normally not required.

The nominated Chief Executive should be identified and his/her credentials furnished to the Director-General on CAD Form Four (DCA 192).

2 Other management staff

The person or persons nominated should represent the management structure of the organisation and be responsible through the Head of Design Organisation to the Chief Executive for the execution of all functions as specified in HKAR-21, Subpart J. Depending on the size of the organisation, the functions may be subdivided under individual managers.

The nominated managers should be identified and their credentials furnished to the Director-General on CAD Form Four (DCA 192) in order that they may be seen to be appropriate in terms of relevant knowledge and satisfactory experience related to the nature of the design activities as performed by the organisation.

The responsibilities and the tasks of each individual manager should be clearly

defined, in order to prevent uncertainties about the relations, within the organisation. Responsibilities of the managers should be defined in a way that all responsibilities are covered.

3 Personnel making decisions affecting airworthiness, operational suitability and environmental protection.

For these personnel, no individual statement is required. The applicant should show to the Director-General that there is a system to select, train, maintain and identify them for all tasks where they are necessary.

The following guidelines for such a system are proposed:

- these personnel should be identified in the handbook, or in a document linked to the handbook. This, and the corresponding procedures, should enable them to carry out the assigned tasks and to properly discharge associated responsibilities;

- the needs, in terms of quantity of these personnel to sustain the design activities, should be identified by the organisation;

- these personnel should be chosen on the basis of their knowledge, background and experience;

- when necessary, complementary training should be established, to ensure sufficient background and knowledge in the scope of their authorisation. The minimum standards for new personnel to qualify in the functions should be established. The training should lead to a satisfactory level of knowledge of the procedures relevant for the particular role;

- training policy forms part of the design assurance system and its appropriateness forms part of investigation by the Director-General within the organisation approval process and subsequent surveillance of persons proposed by the organisation;

- this training should be adapted in response to experience gained within the organisation;

- the organisation should maintain a record of these personnel which includes details of the scope of their authorisation. The personnel concerned should be provided with evidence of the scope of their authorisation; and

- the following minimum information should be kept on record:

(i) Name

(ii) Date of birth

(iii) Experience and training

(iv) Position in organisation

(v) Scope of the authorisation

(vi) Date of first issue of the authorisation

(vii) If appropriate, date of expiry of the authorisation

(viii) Identification number of the authorisation

The record may be kept in any format and should be controlled.

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

- Personnel should be given access to their own record.

- Under the provision of HKAR 21.257 the Director-General has a right of access to the data held in such a system.

- The organisation should keep the record for at least two years after a person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner.

GM No. 2 to HKAR 21.243(d) Data requirements – statement of the qualification and experience – organisations designing minor changes to type design or minor repairs to products

For organisations designing minor changes to type design or minor repairs to products, the statement of the qualifications and experience required by HKAR 21.243(d) should be addressed as follows:

(a) The nominated personnel, the Chief Executive, the Head of Design Organisation and the Chief of the Independent Monitoring, should be identified and their credentials submitted to the Director-General on CAD Form Four (DCA 192) in order that they may be seen to be appropriate in terms of relevant knowledge and satisfactory

experience related to the nature of the design activities as performed by the organisation.

(b) The persons responsible to:

- classify changes to type design or repairs;
- verify compliance [HKAR 21.239(b)];
- approve minor changes to type design and minor repairs [HKAR 21.263(c)2]; and
- issue information or instructions [HKAR 21.263(c)3];

should be selected by the organisation in accordance with a procedure and criteria agreed with the Director-General.

GM No. 3 to HKAR 21.243(d) Data requirements – statement of the qualification and experience

The following personnel making decisions affecting airworthiness, operational suitability and environmental protection should have relevant qualification, experience and training received with respect to functions approved to perform:

(a) Design Engineer (DE)

The DE should satisfy the following criteria:

1 be an employee of the DOA Holder and have a technical position;

2 be a holder of university degree in Engineering (Aerospace, Aeronautical, Mechanical, Electronics, Electrical) or, an associate member or a corporate member of Hong Kong Institution of Engineers (HKIE) [Λ];

3 has not less than two years of design and compliance review experience;

4 has successfully completed the following training courses:

(i) Basic HKAR-21 Training Course;

(ii) DOA (HKAR-21) Training Course;

(iii) Internal Design Organisation Handbook (DOH) Training:

(iv) Human Factors Training; and

(v) Aircraft Familiarisation Course; and

5 has successfully completed discipline-specific training for DE in Table 1 below.

(b) Compliance Verification Engineer (CVE)

The CVE should satisfy the following criteria:

1 has met DE criteria stated in paragraph (a);

2 has not less than two additional years of relevant design and compliance experience; or had been CAD-approved E2 signatory of same discipline;

3 has successfully completed the following training courses:

(i) Hong Kong Airworthiness Course;

(ii) FAR or CS -23 / -25 / -27 / - 29 Training Course; and

(iii) Safety Management System Training Course; and

4 has successfully completed discipline-specific training for CVE in Table 1 below.

Discipline-specific training †	DE	CVE
Structure		
Repair Engineering Course Level 1 (Airbus)	✓	
Metallic Structural Repair Engineering Course (Airbus); or Aircraft Structural Repair for Engineers – Part I & II (Boeing)		✓
Composite Repair Engineering Course (Airbus); or Composite Repair for Engineers (Boeing); or Composite Repair Course (University of Kansas)		✓
Fatigue and Damage Tolerance Course (Airbus)		Subject to DOA Terms of Approval
Systems		
Aircraft Type Approval Course (recognized / approved by CAD)		✓
System Safety Assessment of Aircraft Systems (Cranfield University)		✓
Avionics		
Aircraft Type Approval Course (recognized / approved by CAD)		✓
System Safety Assessment of Aircraft Systems (Cranfield University)		✓

Electrical Wiring Interconnection Systems (EWIS) Training Course		✓
Software Safety, Certification & DO-178		Subject to DOA Terms of Approval
Cabin Safety		
Cabin Safety Design Course (JAA); or Basic of Crashworthiness		✓
Powerplant		
Engine Manufacturer Training Course; or Engine Type Approval Course (recognized / approved by CAD)		✓
System Safety Assessment of Aircraft Systems (Cranfield University)		✓

Table 1

[^]Note: For organisations located outside Hong Kong, equivalent membership of national engineering institutions/authorities may be acceptable to the Director-General.

[†]Note: Subject to approval by the Director-General, equivalent qualifications (e.g. have successfully completed a training acceptable to CAD and/or relevant working experience) may be considered acceptable.

HKAR 21.245 Approval requirements

The design organisation shall demonstrate, on the basis of the information submitted in accordance with HKAR 21.243 that, in addition to complying with HKAR 21.239:

(a) The staff in all technical departments are of sufficient numbers and experience and have been given appropriate authority to be able to discharge their allocated responsibilities and these, together with the accommodation, facilities and equipment, are adequate to enable the staff to achieve the airworthiness, operational suitability and environmental protection objectives for the product.

(b) There is full and efficient coordination between departments and within departments in respect of airworthiness, operational suitability and environment protection matters.

GM to HKAR 21.245 Requirements for approval

(a) *General.* The data submitted in accordance with HKAR 21.243 should show that sufficient skilled personnel are available and suitable technical and organisational provisions have been made for carrying out the Type Investigation defined by GM No. 1 to HKAR 21.239(a), paragraph 2.3.

(b) *Personnel.* The applicant should show that the personnel available to comply with HKAR 21.245(a) are, due to their special qualifications and number, able to provide assurance of the design or modification of a product, as well as the compilation and verification of all data needed to meet the applicable CS and environmental protection requirements while taking into account the present state of the art and new experience.

(c) *Technical.* The applicant should have access to:

1 Workshops and production facilities which are suitable for manufacturing prototype models and test specimens.

2 Accommodation and test facilities which are suitable for carrying out tests and measurements needed to demonstrate compliance with the CS and environmental protection requirements. The test facilities may be subjected to additional technical conditions related to the nature of tests performed.

(d) *Organisation.* The data submitted in accordance with HKAR 21.243 should show that:

1 The Head of the design organisation for which an application for approval has been made, has the direct or functional responsibility for all departments of the organisation which are responsible for the design of the product. If the departments responsible for design are functionally linked, the Head of the design organisation still carries the ultimate responsibility for compliance of the organisation with HKAR-21 Subpart J.

2 An Office of Airworthiness, or equivalent function, has been established and staffed on a permanent basis to act as the focal point for co-ordinating airworthiness, operational suitability and environmental protection matters (see GM No. 1 to HKAR 21.239(a), paragraph 3.1.4); it reports directly to the Head of the design organisation or is integrated into an independent quality assurance organisation reporting to the Head of the design organisation.

3 Reserved.

4 Responsibilities for all tasks related to Type Investigations are assigned in such a way that gaps in authority are excluded.

5 The responsibility for a number of tasks as in GM to HKAR 21.245, paragraph (d)4 may be assigned to one person especially in the case of simple projects.

6 Co-ordination between technical departments and the persons in charge of the system monitoring required by HKAR 21.239(a)3 has been established:

(i) to ensure quick and efficient reporting and resolution of difficulties encountered using the handbook and associated procedures;

(ii) to maintain the design assurance system;

(iii) to optimise auditing activities.

HKAR 21.247 Changes in design assurance system

After the issue of a design organisation approval, each change to the design assurance system that is significant to the showing of compliance or to the airworthiness, operational suitability and environmental protection of the product, shall be approved by the Director-General. The Application for Significant Changes to Design Organisation Approval (DCA 538) shall be submitted to the Director-General and the design organisation shall demonstrate to the Director-General, on the basis of submission of proposed changes to the handbook, and before implementation of the change, that it will continue to comply with this Subpart after implementation.

GM to HKAR 21.247 Significant changes in the design assurance system

In addition to a change in ownership (see HKAR 21.249), the following changes to the design assurance system should be considered as 'significant' to the demonstration of compliance or to the airworthiness, operational suitability or environmental protection of the products:

(a) **Organisation**

- Relocation to new premises;
- Change in the industrial organisation (partnership, suppliers, design work sharing) unless it can be shown that the independent checking function of the demonstration of compliance is not affected;
- Change in the parts of the organisation that contribute directly to the airworthiness, operational suitability or environmental protection (independent checking function, office of airworthiness [or equivalent]); or
- Change to the independent monitoring principles (see HKAR 21.239(a)3).

(b) **Responsibilities**

- Change of the management staff

- the Head of the design organisation [GM No. 1 to HKAR 21.239(a), para.3.1.2; GM to HKAR 21.245, paragraph (d)1; GM to HKAR 21.265(b)];

- the Chief of the Office of Airworthiness [GM to HKAR 21.245, paragraph (d)2]; or

- the Chief of the independent monitoring function of the design assurance system [HKAR 21.239(a)3 and AMC No. 1 to HKAR 21.243(a), paragraph (b)]; or

- New distribution of responsibilities affecting airworthiness, operational suitability or environmental protection;

- For organisations designing minor changes to type design or minor repairs to products, change of the persons identified in GM No. 2 to HKAR 21.243(d).

(c) **Procedures**

Change to the procedures related to:

- the type certification;

- the classification of changes and repairs as 'major' or 'minor' [HKAR 21.263(c)1]

- the treatment of major changes and major repairs;

- the approval of the design of minor changes and minor repairs [HKAR 21.263(c)2];

- the approval of the design of certain major repairs [HKAR 21.263(c)5 or HKAR 21.435(b)];

- the approval of certain major changes to a type certificate [HKAR 21.263(c)8];

- the approval of certain major changes to certain supplemental type certificates;

- continued airworthiness or continued operational suitability [HKAR 21.3];

- the configuration control, when airworthiness, operational suitability or environmental protection is affected;

- the acceptability of design tasks undertaken by partners or sub-contractors [HKAR 21.239(c)]; or

- the issue of data and information under the obligation of HKAR 21.265(h).

(d) **Resources**

- A substantial reduction in number and/or experience of staff (see HKAR 21.245(a)).

HKAR 21.249 Transferability

Except as a result of a change in ownership, which is deemed significant for the purposes of HKAR 21.247, a design organisation approval is not transferable.

HKAR 21.251 Terms of approval

The terms of approval shall identify the types of design work, the categories of products, parts and appliances for which the design organisation holds a design organisation approval, and the functions and duties that the organisation is approved to perform in regard to the airworthiness, operational suitability and environmental characteristics of products. For design organisation approvals covering type certification, the terms of approval shall contain in addition the list of products. Those terms shall be issued as part of a design organisation approval.

HKAR 21.253 Changes to the terms of approval

Each change to the terms of approval shall be approved by the Director-General. An application for a change to the terms of approval shall be made in a form and manner established by the Director-General. The design organisation shall comply with the applicable requirements of this Subpart.

HKAR 21.257 Investigations

(a) The design organisation shall make arrangements that allow the Director-General to make any investigations, including investigations of partners and sub-contractors, necessary to determine compliance and continued compliance with the applicable requirements of this Subpart.

(b) The design organisation shall allow the Director-General to review any report and make any inspection and perform or witness any flight and ground test necessary to check the validity of the compliance statements submitted by the applicant under HKAR 21.239(b).

GM to HKAR 21.257(a) Investigations

Arrangements that allow the Director-General to make investigations include the complete design organisation including partners, sub-contractors and suppliers, whether they are in the State of the applicant or not, assisting and co-operating with the Director-General in performing inspections and audits conducted during initial assessment and subsequent surveillance.

Assistance to the Director-General includes all appropriate means associated with the facilities of the design organisation to allow the Director-General to perform these inspections and audits, such as a meeting room and office support.

HKAR 21.258 Findings

(a) When objective evidence is found showing non-compliance of the holder of a design organisation approval with the applicable requirements of HKAR-21, the finding shall be classified as follows:

1 a level one finding is any non-compliance with the HKAR-21 requirements which could lead to uncontrolled non-compliances with applicable requirements and which could affect the safety of the aircraft.

2 a level two finding is any non-compliance with the HKAR-21 requirements which is not classified as level one.

(b) An observation is any item where it has been identified, by objective evidence, to contain potential problems that could lead to a non-compliance under paragraph (a).

(c) After receipt of notification of findings/observations under the applicable administrative procedures established by the Director-General,

1 in case of a level one finding, the holder of the design organisation approval shall demonstrate corrective action to the satisfaction of the Director-General within a period of no more than 21 working days after written confirmation of the finding;

2 in case of level two 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 three months. In certain circumstances and subject to the nature of the finding the Director-General may extend the three months period subject to the provision of a satisfactory corrective action plan agreed by the Director-General;

3 An observation shall not require immediate action by the holder of the design organisation approval.

(d) In case of level one or level two findings, the design organisation approval may be subject to a partial or full suspension or revocation under the applicable administrative procedures established by the Director-General. The holder of the design organisation approval shall provide confirmation of receipt of the notice of suspension or revocation of the design organisation approval in a timely manner.

HKAR 21.259 Duration and continued validity

(a) A design organisation approval will be issued for a duration of two years. It shall remain valid unless:

1 the design organisation fails to demonstrate compliance with the applicable requirements of this Subpart; or

2 the Director-General is prevented by the holder or any of its partners or sub-contractors to perform the investigations in accordance with HKAR 21.257; or

3 there is evidence that the design assurance system cannot maintain satisfactory control and supervision of the design of products or changes thereof under the approval; or

4 the certificate has been surrendered or revoked under the applicable administrative procedures established by the Director-General.

(b) Upon surrender or revocation, the certificate shall be returned to the Director-General.

HKAR 21.263 Privileges

(a) Reserved;

(b) Reserved:

(c) The holder of a design organisation approval shall be entitled, within the scope of its terms and approval, as established by the Director-General, and under the relevant procedures of the design assurance system:

1 to classify changes to a type certificate or to a supplemental type certificate and repairs designs as ‘major’ or ‘minor’;

2 to approve minor changes to a type certificate or to a supplemental type certificate and minor repair designs;

3 to issue information or instructions containing the following statement: 'The technical content of this document is approved under the authority of DOA

Reference No. XXXX.'; or

4 to approve minor revisions to the aircraft flight manual and supplements, and issue such revisions containing the following statement: 'Revision No. XXXX to AFM (or supplement) Reference YYY is approved under the authority of DOA Reference No. XXXX.';

5 to approve certain major repair designs under Subpart M to products;

6 reserved;

7 reserved;

8 to approve certain major changes to a type certificate under Subpart D to products; and

9 to submit compliance documents for the purpose of obtaining a supplemental type certificates under Subpart E.

AMC to HKAR 21.263(c)1 Procedure for the classification of changes and repairs

PROCEDURE FOR THE CLASSIFICATION OF CHANGES TO TYPE CERTIFICATE (TC) OR TO A SUPPLEMENTAL TYPE CERTIFICATE (STC), AND OF REPAIR DESIGNS AS 'MINOR' OR 'MAJOR'

(a) **INTENT**

This AMC provides the means to develop a procedure for the classification of changes to type certificate or to that part of the product covered by a STC, and repair designs.

Each DOA applicant must develop its own internal classification procedure following this AMC in order to obtain the associated privilege under HKAR 21.263(c)1.

(b) **PROCEDURE FOR THE CLASSIFICATION OF CHANGES TO A TC, OR TO THAT PART OF THE PRODUCT COVERED BY A STC, AND REPAIR DESIGNS**

(i) Content

The procedure must address the following points:

- the identification of changes to a TC or that that part of the product covered by a STC, and repair designs;

- classification;
- justification of the classification;
- acceptance of the classification by authorised signatories; and
- supervision of changes to a TC or that part of the product covered by a STC, and repair designs, initiated by subcontractors.

(ii) Identification of changes to a TC or that that part of the product covered by a STC, and repair designs

The procedure must indicate how the following are identified:

- items (consisting of areas, systems, parts, or appliances) to be affected by the change or repair following the definitions provided in paragraph 3.9 of GM to HKAR 21.101;
- airworthiness directives which have, or might have, an impact on any of the identified items affected by the change or repair;
- other constituents of the TC and of the pre-existing change(s) to the TC as applicable to the affected items (for instance, operating limitations, OSD constituents, manuals — see also HKAR 21.90A and the associated GM) to be affected by the change or repair;
- the existing type certification basis of the affected items containing, as applicable, the certification specifications, special conditions, deviations from the applicable certification specifications and the equivalent level of safety findings incorporated by reference in the TC of the product to be changed;
- the existing OSD certification basis;
- the definition of the change or repair to the affected items and to the other affected constituents of the TC and of the pre-existing change(s) to the TC, if applicable, in accordance with the provisions of HKAR 21.31 and HKAR 21.91;
- the certification basis of the change or repair determined in accordance with HKAR 21.101 with the support of GM to HKAR 21.101 (HKAR 21.433 for repairs); this might lead to preclassification of the change as ‘major significant’ as per the associated definitions (see point (b)(iii) below).

The procedure should request the applicant to record a justification that the information, on which those identifications are based, is adequate. This may be done

either by using the DOA holder's own resources, or through an arrangement with the TC holder, or any other design approval holder as relevant.

The procedure should address cases where the pre-existing configuration of the type design is the result of multiple changes or repairs applied to the same areas, systems, parts, equipment or appliances.

(iii) Classification

The procedure should show how the effects on airworthiness, operational suitability and environmental protection are analysed, from the very beginning, by reference to the specific applicable requirements of the affected items.

If no specific certification specifications or environmental protection requirements are applicable to the affected items, the above review must be carried out at the level of the part or system where the affected items are integrated and where specific certification specifications or environmental protection requirements are applicable.

For changes to a TC, the criteria used for the classification should be in compliance with HKAR 21.91 and follow the guidelines provided in GM to HKAR 21.91.

For repairs, the criteria used for the classification should be in compliance with HKAR 21.435 and follow the guidelines provided in GM to HKAR 21.435(a).

The procedure should define provisions to contact the Director-General in case of doubts regarding the classification.

The procedure should take into consideration that a change to a TC may have been found to be significant according to HKAR 21.101 and following the definitions provided in GM to HKAR 21.101. Therefore, it is already pre-classified at the stage of the determination of the certification basis (see point (b)(ii) above).

(iv) Justification of the classification

All decisions on the classification of changes to a TC or that that part of the product covered by a STC and repair designs classified as "major" or "minor" must be recorded, and, for those which are not straightforward, also justified according to the procedure and criteria in point (b)(iii) above. These records must be easily accessible to the Director-General for sample checking.

(v) Acceptance of the classification by the authorised signatories

All classifications of changes to a TC or that that part of the product covered by a STC and repair designs must be accepted by an appropriately authorised signatory, belonging to or tasked by the Office of Airworthiness, as explained in GM No.1 to

HKAR 21.239(a)(3.1.4)(r).

The procedure must indicate the authorised signatories for the various products listed in the terms of approval.

For those changes or repairs that are handled by sub-contractors, as described under point (b)(vi), a description should be provided of how the DOA holder manages its classification responsibility.

The final classification may be:

- major changes significant to a TC;
- major changes not significant to a TC or major repairs;
- minor changes to a TC or minor repairs where additional work is necessary to demonstrate compliance with the certification basis, the operational suitability data certification basis, where applicable, and the environmental protection requirements; or
- minor changes to a TC or minor repairs requiring no further demonstration of compliance.

The procedure should indicate how the above four classes of changes/repairs are identified, taking into consideration the requirements laid down in HKAR 21.31.

(vi) Supervision of changes to a TC or to that part of the product covered by a STC and repairs initiated by sub-contractors

The procedure must indicate, directly or by cross-reference to written procedures, how changes to a TC or that that part of the product covered by a STC, and repair designs may be initiated and classified by subcontractors and are controlled and supervised by the DOA holder, taking into consideration the requirements laid down in HKAR 21.239(c) and the associated GM to HKAR 21.239(c).

AMC No. 1 to HKAR 21.263(c)2 Procedure for the approval of minor changes and minor repairs

PROCEDURE FOR THE APPROVAL OF MINOR CHANGES AND MINOR REPAIRS TO A TYPE CERTIFICATE (TC) OR A SUPPLEMENTAL TYPE CERTIFICATE (STC)

(a) **INTENT**

This AMC provides the means to develop a procedure for the approval of minor changes to a TC or to that part of the product covered by a STC, and minor repairs.

Each DOA applicant should develop its own internal procedures following this AMC, in order to obtain the associated privilege under HKAR 21.263(c)2.

(b) **PROCEDURE FOR THE APPROVAL OF MINOR CHANGES TO A TC, OR TO THAT PART OF THE PRODUCT COVERED BY A STC AND MINOR REPAIRS**

1 Content

The procedure should address the following points:

- compliance documentation;
- approval under the DOA privilege;
- authorised signatories; and
- supervision of minor changes to a TC or to that part of the product covered by a STC, and minor repairs handled by subcontractors.

2 Compliance documentation

For those minor changes to a TC or to that part of the product covered by a STC, and minor repairs where additional work to demonstrate compliance with the applicable certification specifications and environmental protection requirements is necessary, compliance documentation should be established and independently checked as required by HKAR 21.239(b).

The procedure must describe how the compliance documentation is produced and checked. For compliance documentation, see also AMC to HKAR 21.20(c).

3 Approval under the DOA privilege

(i) For those minor changes to a TC or to that part of the product covered by a STC, and minor repairs where additional work to demonstrate compliance with the applicable certification specifications and environmental protection requirements is necessary, the procedure must define a document to formalise the approval under the DOA privilege.

This document should include at least:

- brief description of the change or repair and reasons for change or repair;
- identification of the initial configuration of the affected area and

other items (which determines the eligibility for installation of the change or repair into an aircraft);

- identification of the final configuration of the affected area, and of supplements to the manuals and to OSD constituents;

- applicable certification specifications and environmental protection requirements and methods of compliance;

- reference to the compliance documents;

- the effects, if any, on the limitations and on the approved documentation;

- evidence of the independent checking function of the demonstration of compliance;

- evidence of the approval under the privilege of HKAR 21.263(c)2 by an authorised signatory;

- date of the approval.

For repairs, see AMC to HKAR 21.433(b) and HKAR 21.447.

(ii) For the other minor changes to a TC or to that part of the product covered by a STC, and minor repairs, the procedure should define a means to identify the change or repair and reasons for the change or repair, and to formalise its approval by the appropriate engineering authority under an authorised signatory. This function may be delegated by the Office of Airworthiness but must be controlled by the Office of Airworthiness, either directly or through appropriate procedures of the DOA holder's design assurance system.

4 Authorised signatories

The persons authorised to sign for the approval under the privilege of HKAR 21.263(c)2 must be identified (name, signature and scope of authority) in appropriate documents that may be linked to the handbook.

5 Supervision of minor changes to a TC or to that part of the product covered by a STC, and minor repairs handled by subcontractors

For the minor changes to a TC or to that part of the product covered by a STC, and minor repairs described in AMC No. 1 to HKAR 21.263(c)2, paragraph (b)3(ii), that are handled by subcontractors, the procedure should indicate,

directly or by cross-reference to written procedures, how these minor changes to a TC or to that part of the product covered by a STC, and minor repairs are approved at the subcontractor level and the arrangements made for the control and supervision by the DOA holder.

AMC No. 2 to HKAR 21.263(c)2 Reserved

AMC No. 3 to HKAR 21.263(c)2 Procedure for the approval of minor changes to a type certificate(TC) which affect the aircraft flight manual (AFM)

(a) **INTENT**

This AMC provides additional guidance for developing a procedure for the approval of minor changes to a TC which affect the aircraft flight manual (AFM).

Each DOA applicant/holder should develop its own internal procedure, based on these guidelines. For guidance on the classification of changes to a TC which affect the AFM, see GM to HKAR 21.91.

(b) **PROCEDURE FOR THE APPROVAL OF MINOR CHANGES TO A TC WHICH AFFECT THE AFM**

1 **Content**

The procedure should address the following points:

- assessment of any change to a TC for the impact of the change on the AFM;
- preparation of revisions or supplements to the AFM;
- classification of the change to a TC, taking into account the impact on the AFM;
- classification of stand-alone revisions or supplements to the AFM;
- control of the configuration of the AFM;
- approval of the revisions or supplements to the AFM; and
- the approval statement.

2 **Assessment of a change for its impact on the AFM**

The procedure should include an assessment of whether or not the AFM is impacted by the change.

3 **Preparation**

The procedure should indicate how revisions or supplements to the AFM are prepared and how the coordination among the persons in charge of design changes is performed.

4 **Classification**

The procedure should indicate how changes to a TC which affect the AFM are classified, in accordance with the criteria of GM to HKAR 21.91 Section 3.4.

The procedure should indicate how classification decisions are recorded, documented and signed.

Easy accessibility of these records to Director-General for sample checking should be ensured. All classifications should be accepted by an appropriately authorised signatory. The procedure should indicate the authorised signatories for the various products listed in the terms of approval.

5 **Configuration control of the AFM**

The procedure should explain the traceability of changes in order to understand who has approved what. Especially if a given page or data module has been revised several times, it should be traceable which part(s) of the page or data module has (have) been approved directly by the Director-General under which approval, and which part(s) has (have) been approved under the privilege of a DOA holder.

6 **Approval**

The procedure should indicate how the approval under the privilege of HKAR 21.263(c)2 is formalised.

The authorised signatories should be identified (name, signature), together with the scope of the authorisation, in a document that is linked to the DOA handbook.

7 **Approval statement**

The amended AFM, or the supplement to the AFM, approved under the

privilege of HKAR 21.263(c)2 should be issued under the obligation of HKAR 21.265(h) (see HKAR 21.265(h) and the related GM) with a respective statement in the log of revisions.

AMC to HKAR 21.263(c) 5 and 8 Scope and criteria

(a) **Definition of 'certain major repairs'**

'Certain major repairs' for which privileges may be granted as per HKAR 21.263(c)5 are:

1 major repairs to products for which the design organisation approval (DOA) holder holds the type certificate (TC) or the supplemental type certificate (STC); or
2 major repairs to products for which the DOA holder does not hold the TC or the STC but if supported by TCH or STCH.

(b) **Definition of 'certain major changes'**

'Certain major changes' for which privileges may be granted as per HKAR 21.263(c)8 only if supported by TCH or STCH.

HKAR 21.265 Obligations of the holder

The holder of a design organisation approval shall, within the scope of its terms of approval, as established by the Director-General:

(a) Maintain the handbook required under HKAR 21.243 in conformity with the design assurance system;

(b) Ensure that this handbook or the relevant procedures included by cross-reference are used as a basic working document within the organisation;

(c) Determine that the design of products, or changes or repairs thereof comply with applicable specifications requirements and have no unsafe features;

(d) Provide the Director-General with statements and associated documentation confirming compliance with point (c), except for approval processes carried out in accordance with HKAR 21.263(c);

(e) Provide to the Director-General data and information related to the actions required under HKAR 21.3B;

(f) Reserved;

(g) Reserved; and

(h) Designate data and information issued under the authority of the approved design organisation within the scope of its terms of approval as established by the Director-General with the following statement: "The technical content of this document is approved under the authority of DOA Reference No. A21J/XXX/XXXX.'

AMC No. 1 to HKAR 21.265(a) Administration of the handbook

(a) The handbook of the applicant must be in English. The applicant may in addition provide a translation of the handbook and other supporting documents as necessary in the language which will permit the best use of them by all personnel charged with the tasks performed for the purpose of the design organisation.

(b) The handbook must be produced in a concise form with sufficient information to meet HKAR 21.243 relevant to the scope of approval sought by the applicant. The handbook must include the following:

1 organisation name, address, telephone, telex and facsimile numbers;

2 document title, and company document reference No (if any);

3 amendment or revision standard identification for the document;

4 amendment or revision record sheet;

5 list of effective pages with revision/date/amendment identification for each page;

6 contents list or index;

7 a distribution list for the Handbook;

8 an introduction, or foreword, explaining the purpose of the document for the guidance of the organisation's own personnel. Brief general information concerning the history and development of the organisation and, if appropriate, relationships with other organisations which may form part of a group or consortium, must be included to provide background information for the Director-General;

9 the certificate of approval must be reproduced in the document; and

10 identification of the department responsible for administration of the Handbook.

Note: In the case of an initial or revised approval it is recognised that certificate will be issued after Director-General's agreement to the Handbook content in draft

form. Arrangements for formal publication in a timely manner must be agreed before the certificate of approval is issued.

(c) An updating system must be clearly laid down for carrying out required amendments and modifications to the handbook.

(d) The Handbook may be completely or partially integrated into the company organisation manual. In this case, identification of the information required by HKAR 21.243 must be provided by giving appropriate cross references, and these documents must be made available, on request, to the Director-General.

AMC No. 2 to HKAR 21.265(a) Handbook format and publication means

The term 'handbook' is meant to describe a means to document the design organisation's processes and procedures. This may be in an electronic or paper format, as a stand-alone document or integrated in a management system. It may consist of:

(a) An online integrated management system with flowcharts and descriptions embedded in it;

(b) An online system referring to single documents;

(c) A classic handbook with references to online procedures;

(d) Or any other combination of the above.

In any case, as required by point (c) of HKAR 21.243, independently of the system chosen by the design organisation, the relevant content and the means to update the system should be clearly identified.

GM to HKAR 21.265(b) Use of handbook

(a) The handbook should be signed by the Chief Executive and the Head of the design organisation and declared as a binding instruction for all personnel charged with the development and type investigation of products. This binding statement should be provided independently of the means chosen by the design organisation to document its processes and procedures.

(b) All procedures referenced in the handbook are considered as parts of the handbook and therefore as basic working documents.

GM to HKAR 21.265(h) Designation of data and information issued under the authority of a design organisation approval (DOA) holder

(a) **Intent**

This GM provides guidance for complying with the obligation of HKAR 21.265(h), and addresses the various aspects that the DOA holder should cover in order to have a comprehensive procedure for the designation of data and information.

(b) **Scope**

The term 'data and information' as used in HKAR 21.265(h) also includes instructions.

Data and information referred to in HKAR 21.265(h) are issued by a DOA holder and cover the following:

- embodiment instructions for design changes or repairs (usually in the form of a service bulletin, a modification bulletin, repair instructions or engineering order, etc.);

- manuals required by HKAR-21 or the applicable CSs (such as the aircraft flight manual (AFM), rotorcraft flight manual, instructions for continuing airworthiness (ICAs), etc.);

- operation suitability data (OSD);

- continued-airworthiness instructions (usually in the form of service bulletins) which may be covered by airworthiness directives (ADs); and

- additional data to be defined by the DOA holder (e.g. alternative maintenance instructions that are not, per se, ICAs).

Note: This data and information may be issued in a digital or paper format.

The obligation does not apply to, and the statement provided with the data and information should not be used on, the following documents:

- certification documents (e.g. the certification programme, compliance checklist, etc.);

- compliance documents;

- design data transferred to production organisations; and

- production deviations (also referred to as ‘unintended deviations’ or ‘concessions’).

(c) **Rationale**

The purpose of this obligation is to give certainty to the end users about the approval status of the data and information issued by the DOA holder.

(d) **Statement**

The statement provided with the data and information should also cover those items prepared by subcontractors or vendors that the DOA holder has declared as applicable to their products. The technical content of the statement is related to the type certificate data and information.

The approval included in the statement means that:

- the type certificate data has been appropriately approved; and

- the information contains practical and well-defined installation or inspection methods, and, when those methods are implemented, the product is in conformity with the approved type certificate data.

Note: Data and information related to the measures required by HKAR 21.3B(b) (airworthiness directives (ADs)) are submitted to the Director-General to ensure their compatibility with the content of an AD (see point HKAR 21.265(e)), and contain a statement that they are, or will be, subject to an AD issued by the Director-General.

SUBPART K PARTS AND APPLIANCES

HKAR 21.301 Scope

This Subpart establishes the procedure relating to the approval of parts and appliances.

HKAR 21.302 Compliance with applicable requirements

The showing of compliance of parts and appliances to be installed in a type certificated product shall be made:

(a) In conjunction with the type certification procedures of Subpart B, D or E for the product in which it is to be installed;

(b) Where applicable, under the HTSO authorisation procedures of Subpart O; or

(c) In the case of standard parts, in accordance with officially recognised Standards.

AMC to HKAR 21.302(c) Standard parts

(a) In this context a part is considered as a 'standard part' where it is designated as such by the design approval holder responsible for the product, part or appliance, in which the part is intended to be used. In order to be considered a 'standard part', all design, manufacturing, inspection data and marking requirements necessary to demonstrate conformity of that part should be in the public domain and published or established as part of officially recognised Standards, or

(b) Reserved.

GM to HKAR 21.302(c) Officially recognised standards

In this context 'officially recognised Standards' means:

(a) Those standards established or published by an official body whether having legal personality or not, which are widely recognised by the air transport sector as constituting good practice.

(b) Reserved.

HKAR 21.303 Hong Kong Parts Manufacturer Approval

(a) Except as provided in paragraph (b) of this Section, no person may produce a

modification or replacement part for sale for installation on a type certificated product unless it is produced pursuant to a HPMA issued under this Subpart.

(b) This Section does not apply to the following:

1 parts produced under a type certificate or production organisation approval of HKAR-21;

2 parts produced under a HTSO; or

3 standard parts (such as bolts and nuts) conforming to officially recognised Standards.

(c) An application for a HPMA shall be made to the Director-General and shall include the following:

1 the identity of the product on which the part is to be installed;

2 the name and address of the manufacturing facilities at which these parts are to be manufactured; and

3 the design of the part, which consists of:

(i) drawings and specifications necessary to show the configuration of the part; and

(ii) information on dimensions, materials, and processes necessary to define the structural strength of the part; and

4 test reports and computations necessary to show that the design of the part meets the airworthiness requirements applicable to the product on which the part is to be installed, unless the applicant shows that the design of the part is identical to the design of a part that is covered under a type certificate. If the design of the part was obtained by a licensing agreement, evidence of that agreement shall be furnished.

(d) An applicant shall be entitled to a HPMA for a replacement or modification part if:

1 the Director-General finds, upon examination of the design and after completing all tests and inspections, that the design meets the airworthiness requirements applicable to the product on which the part is to be installed; and

2 the applicant submits a statement certifying that he has established the fabrication inspection system required by paragraph (h) of this Section.

(e) Each applicant for a HPMA shall allow the Director-General to make any inspection or test necessary to determine compliance with the applicable airworthiness requirements. However, unless otherwise authorised by the Director-General:

1 no part may be presented to the Director-General for an inspection or test unless compliance with paragraphs (f)2 through (f)4 of this Section has been shown for that part; and

2 no change may be made to a part between the time that compliance with paragraphs (f)2 through (f)4 of this Section is shown for that part and the time that the part is presented to the Director-General for the inspection or test.

(f) Each applicant for a HPMA shall make all inspections and tests necessary to determine:

1 compliance with the applicable airworthiness requirements;

2 that materials conform to the specifications in the design;

3 that the part conforms to the drawings in the design; and

4 that the fabrication processes, construction, and assembly conform to those specified in the design.

(g) The Director-General does not issue a HPMA if the manufacturing facilities for the part are located outside of the Hong Kong Special Administrative Region, unless the Director-General finds that the location of the manufacturing facilities places no burden on the Director-General in administering applicable airworthiness requirements.

(h) Each holder of a HPMA shall establish and maintain a fabrication inspection system that ensures that each completed part conforms to its design data and is safe for installation on applicable type certificated products. The system shall include the following:

1 incoming materials used in the finished part shall be as specified in the design data;

2 incoming materials shall be properly identified if their physical and chemical properties cannot otherwise be readily and accurately determined;

3 materials subject to damage and deterioration shall be suitably stored and adequately protected;

4 processes affecting the quality and safety of the finished product shall be

accomplished in accordance with acceptable specifications;

5 parts in process shall be inspected for conformity with the design data at points in production where accurate determination can be made. Statistical quality control procedures may be employed where it is shown that a satisfactory level of quality will be maintained for the particular part involved;

6 current design drawings shall be readily available to manufacturing and inspection personnel, and used when necessary;

7 major changes to the basic design shall be adequately controlled and approved before being incorporated in the finished part;

8 rejected materials and components shall be segregated and identified in such a manner as to preclude their use in the finished part; and

9 inspection records shall be maintained, identified with the completed part, where practicable, and retained in the manufacturer's file for a period of at least two years after the part has been completed.

(i) A HPMA issued under this Section is not transferable and is effective until surrendered or withdrawn or otherwise terminated by the Director-General.

(j) The holder of a HPMA shall notify the Director-General in writing within 10 days from the date the manufacturing facility at which the parts are manufactured is relocated or expanded to include additional facilities at other locations.

(k) Each holder of a HPMA shall determine that each completed part conforms to the design data and is safe for installation on type certificated products.

HKAR 21.305 Approval of parts and appliances

In all cases where the approval of a part or appliance is explicitly required by the Director-General, it may be approved:

(a) Under a HPMA issued under Subpart K;

(b) Under a HTSO issued under Subpart O;

(c) Under the specifications recognised as equivalent by the Director-General in the particular case;

(d) In conjunction with type certificate procedures of Subpart B, D or E for a product; or

(e) In any other manner approved by the Director-General.

HKAR 21.307 The eligibility of parts and appliances for installation

(a) A part or appliance shall be eligible for installation in a type certificated product when it is in a condition for safe operation, and it is in a condition for safe operation, marked in accordance with Subpart Q and accompanied by an authorised release certificate (CAD Form One), certifying that the item was manufactured in conformity to approved design data.

(b) By way of derogation from point (a) and provided that the conditions in point (c) are met, the following parts or appliances do not require a CAD Form One in order to be eligible for installation in a type-certified product:

1 a standard part;

2 reserved;

3 a part or appliance for which the consequences of a non-conformity with its approved design data has a negligible safety effect on the product and which is identified as such by the holder of the design approval in the instructions for continued airworthiness. In order to determine the safety effects of a non-conforming part or appliance, the design approval holder may establish in the instructions for continued airworthiness specific verification activities to be conducted by the installer of the part or appliance on the product;

4 reserved;

5 reserved; and

6 a part or appliance that is an item of a higher assembly identified in points (b)(1) to (b)(5).

(c) Parts and appliances listed in point (b) are eligible for installation in a type-certified product without being accompanied by an CAD Form One, provided that the installer holds a document issued by the person or organisation that manufactured the part or appliance, which declares the name of the part or appliance, the part number, and the conformity of the part or appliance with its design data, and which contains the issuance date.

AMC to HKAR 21.307(b)(3) Verification activities to be conducted on the part or appliance or release documentation prior to installation

To prevent a non-negligible safety effect on the product, due to the installation of a part or appliance referred to in point HKAR 21.307(b)(3) that could potentially not conform to its

design, the design approval holder (DAH) may identify in the ICA (in the case of HKAR 21.307(b)(3)) any specific verification activities to be conducted by the installer on the part or appliance before installing it on the product.

When assessing the safety effect of a part or appliance identified in point HKAR 21.307(b)(3), the DAH should assume that the installer would conduct any specific verification activities on the part or appliance or release documentation, as identified in the ICA.

Example: Information from the DAH contained in the ICA: 'Part XXX-YY must comply with flammability requirement JJJ-KKK'.

GM to HKAR 21. 307(b)(3) Meaning of 'negligible safety effect'

For the purpose of HKAR 21.307(b)(3), when 'a part or appliance for which the consequences of non-conformity to its design has a negligible safety effect when installed on the product' is mentioned, it means that any non-conformity of the part or appliance not identified by the installer that conducted the specific verification activities mentioned in HKAR21.307(c):

(a) reserved;

(b) for any aircraft:

1 has no effect on the operational or functional certified capabilities of the aircraft, or on its safety margins;

2 causes no physical discomfort to the occupants; and

3 has no effect on the flight crew.

GM to HKAR 21. 307(b)(6) Part or appliance that is part of a higher-level Assembly

A CAD Form One is not required for a part or appliance when that part or appliance is an element of a higher-level assembly for which a CAD Form One is not required.

(SUBPART L RESERVED)

SUBPART M REPAIRS

HKAR 21.431 Scope

(a) This Subpart establishes the procedure for the approval of repair design, and establishes the rights and obligations of the applicants for, and holders of, those approvals.

(b) Reserved.

(c) A 'repair' means elimination of damage and/or restoration to an airworthy condition following initial release into service by the manufacturer of any product, part or appliance.

(d) Elimination of damage by replacement of parts or appliances without the necessity for design activity shall be considered as a maintenance task and shall therefore require no approval under HKAR-21.

(e) A repair to a HTSO article other than an Auxiliary Power Unit (APU) shall be treated as a change to the HTSO design. Repair to a HTSO article shall be processed in accordance with HKAR 21.611.

GM No. 1 to HKAR 21.431 Scope

(a) Hong Kong approvals are issued under HKAR-21 by the Director-General or by the Design Organisations which are approved under Subpart J of HKAR-21. Repair designs shall be supported by Hong Kong approvals or ‘Arrangements’ with other civil aviation authorities.

Note: Repair designs covered under ‘Arrangements’ do not require validation by the Director-General.

The ‘Arrangements’ established with other civil aviation authorities are published in the Civil Aviation Department website.

(b) The aircraft registered owner is responsible for:

1 compliance of additional airworthiness requirements stipulated in Air Navigation (Hong Kong) Order 1995 and Hong Kong Airworthiness Notices at aircraft level; and

2 implementation of instructions for continued airworthiness where applicable.

GM No. 2 to HKAR 21.431 Data for development of repair design

Manuals and other instructions for continued airworthiness (such as the Manufacturers Structural Repair Manual, Maintenance Manuals and Engine Manuals provided by the holder of the type certificate, supplemental type certificate as applicable) for operators, contain useful information for the development and approval of repairs.

When these data are explicitly identified as approved, they may be used by operators without further approval to cope with anticipated in-service problems arising from normal usage provided that they are used strictly for the purpose for which they have been developed.

Approved data is data which is approved under Hong Kong approvals or the 'Arrangements' with other civil aviation authorities. The 'Arrangements' established with other civil aviation authorities are published in the Civil Aviation Department website.

GM to HKAR 21.431(e) Repairs to technical standard order (HTSO) articles other than auxiliary power units (APU)

A repair to a HTSO article other than an APU can either be seen:

(a) Under HKAR 21.611 in the context of a HTSO authorisation, i.e., when an article as such is specifically approved under Subpart O, with dedicated rules that give specific rights and obligations to the designer of the article, irrespective of any product type design or change to the type design. For a repair to such an article, irrespective of installation on any aircraft, Subpart O, and HKAR 21.611, should be followed; or

(b) When an airline or a maintenance organisation is designing a new repair (based on data not published in the TC holder or Original Equipment Manufacturer documentation) on an article installed on an aircraft, such a repair can be considered as a repair to the product in which the article is installed, not to the article taken in isolation. Therefore Subpart M can be used for the approval of this repair, that will be identified as 'repair to product x affecting article y', but not 'repair to article y'.

HKAR 21.432A Eligibility

(a) Any natural or legal person that has demonstrated, or is in the process of demonstrating, its capability under HKAR 21.432B shall be eligible as an applicant for a major repair design approval under the conditions laid down in this Subpart.

(b) Any natural or legal person, who has sound knowledge of the design principles embodied in the aircraft type being repaired, shall be eligible to apply for approval of a minor repair design.

HKAR 21.432B Demonstration of capability

(a) An applicant for a major repair design approval shall demonstrate its capability by holding a design organisation approval, issued by the Director-General in accordance with Subpart J.

(b) By way of derogation from paragraph (a), the applicant shall seek an agreement accepted by the Director-General.

(c) Reserved.

HKAR 21.432C Application for a repair design approval

(a) An applicant for a repair design approval shall be made in a form and manner established by the Director-General.

(b) Reserved.

AMC to HKAR 21.432C(a) Form and manner

The applicant should file an application using application forms 'Application for Approval of Minor Change/Minor Repair Design' DCA 536 (CAD Form 32) for the approval of minor repair designs or 'Application for Approval of Major Repair Design' DCA 535 (CAD Form 31) for the approval of major repair designs. These forms are available from the CAD website.

The forms should be completed in accordance with the instructions of the application forms.

HKAR 21.433 Requirements for the approval of a repair design

(a) The repair design should only be approved:

1 when it has been demonstrated, following the instructions required by CAD Form 31 or CAD Form 32 referred to in AMC to HKAR 21.432C(a), that the repair design complies with the type certification basis incorporated by reference in the type certificate, the supplemental type certificate, as applicable, or those in effect on the date of application (for repair design approval), as well as any amendments established and notified by the Director-General;

2 when compliance with the type certification basis that applies in accordance with paragraph (a)1 has been declared and the justifications of compliance have been recorded in the compliance documents;

3 when no feature or characteristic has been identified that may make the product unsafe for the uses for which certification is requested; and

4 where the applicant has specified that it provided certification data on the basis of an arrangement with the owner of the type certification data for a major design approval:

(i) when the holder has indicated that it has no technical objection to the information submitted under paragraph (a)2; and

(ii) when the holder has agreed to collaborate with the repair design approval holder to ensure discharge of all obligations for continued airworthiness of the changed product through compliance with HKAR 21.451.

(b) The applicant shall submit to the Director-General the declaration referred to in paragraph (a)2 and, on request by the Director-General, all necessary substantiation data.

AMC to HKAR 21.433(b) and HKAR 21.447 Repair design and record keeping

(a) Relevant substantiation data associated with a new major repair design and record keeping should include:

1 the identification of the damage and the reporting source;

2 the major repair design approval sheet identifying applicable specifications and references of justifications;

3 the repair drawing and/or instructions and scheme identifier;

4 the correspondence with the holder of the type certificate (TC) or supplemental type certificate (STC), if its advice on the design has been sought;

5 the structural justification (static strength, fatigue, damage tolerance, flutter, etc) or references to this data;

6 the effect on the aircraft, engines and/or systems, (performance, flight handling, etc., as appropriate);

7 the effect on the maintenance programme;

8 the effect on airworthiness limitations, the flight manual and the operating manual;

9 any weight and moment changes, and

10 special test requirements.

(b) Relevant minor repair documentation includes paragraphs (a) 1 and 3. Other points of paragraph (a) may be included where necessary. If the repair is outside the approved data, justification for classification is required.

(c) Special consideration should be given to repairs that impose subsequent limitations on the part, product or appliance (e.g., engine turbine segments that may only be repaired a finite number of times, the number of repaired turbine blades per set, oversizing of fastener holes, etc.).

(d) Special consideration should also be given to life limited parts and critical parts, notably with the involvement of the TC or STC holder, when deemed necessary under HKAR 21.433(a)4.

(e) Repairs to engine or APU critical parts would only be accepted with the involvement of the TC holder.

HKAR 21.435 Classification and approval of repair designs

(a) A repair design shall be classified as either 'major' or 'minor' in accordance with the criteria set out in HKAR 21.91 for a change to the type certificate.

(b) A repair shall be classified and approved by:

1 the Director-General, or

2 an approved design organisation within the scope of its privileges provided for HKAR 21.263(c) 1, 2 and 5, as recorded in the terms of approval.

GM to HKAR 21.435(a) Classification of repairs

(a) Clarification of the terms Major/Minor

In line with the definitions given in HKAR 21.91, a new repair is classified as 'major' if the result on the approved type design has an appreciable effect on structural performance, weight, balance, systems, operational characteristics or other characteristics affecting the airworthiness of the product, part or appliance. In particular, a repair is classified as major if it needs extensive static, fatigue and damage tolerance strength justification and/or testing in its own right, or if it needs methods, techniques or practices that are unusual (i.e., unusual material selection, heat treatment, material processes, jigging diagrams, etc.).

Repairs that require a re-assessment and re-evaluation of the original certification substantiation data to ensure that the aircraft still complies with all the relevant requirements, are to be considered as major repairs.

Repairs whose effects are considered minor and require minimal or no assessment of the original certification substantiation data to ensure that the aircraft still complies with all the relevant requirements, are to be considered 'minor'.

It is understood that not all the certification substantiation data will be available to those persons/organisations classifying repairs. A qualitative judgement of the effects of the repair will therefore be acceptable for the initial classification. The subsequent review of the design of the repair may lead to it being re-classified, owing to early judgements being no longer valid.

(b) Airworthiness concerns for Major/Minor classification

The following should be considered for the significance of their effect when classifying repairs. Should the effect be considered to be significant then the repair should be classified 'Major'. The repair may be classified as 'Minor' where the effect is known to be without appreciable consequence.

1 Structural performance

Structural performance of the product includes static strength, fatigue, damage tolerance, flutter and stiffness characteristics. Repairs to any element of the structure should be assessed for their effect upon the structural performance.

2 Weight and balance

The weight of the repair may have a greater effect upon smaller aircraft as opposed to larger aircraft. The effects to be considered are related to overall aircraft centre of gravity and aircraft load distribution. Control surfaces are particularly sensitive to the changes due to the effect upon the stiffness, mass distribution and surface profile which may have an effect upon flutter characteristics and controllability.

3 Systems

Repairs to any elements of a system should be assessed for the effect intended on the operation of the complete system and for the effect on system redundancy. The consequence of a structural repair on an adjacent or remote system should also be considered as above, (for example: airframe repair in area of a static port).

4 Operational characteristics

Changes may include:

- stall characteristics;
- handling;
- performance and drag; and
- vibration.

5 Other characteristics

- changes to load path and load sharing;
- change to noise and emissions; and
- fire protection / resistance.

Note: Considerations for classifying repairs 'Major/Minor' should not be limited to those listed above.

(c) Examples of 'Major' repairs

1 A repair that requires a permanent additional inspection to the approved maintenance programme, necessary to ensure the continued airworthiness of the product. Temporary repairs for which specific inspections are required prior to installation of a permanent repair do not necessarily need to be classified as 'Major'.

2 A repair to life limited or critical parts.

3 A repair that introduces a change to the Aircraft Flight Manual.

GM to HKAR 21.435(b) Repair design approval

(a) REPAIR DESIGN APPROVAL BY THE DIRECTOR-GENERAL

1 Approval from Director General is required in cases of major repair designs proposed by design organisation approval (DOA) holders that do not hold the necessary privilege as per HKAR 21.263(c)5 to approve certain major repair designs, as well as in cases of minor repair designs proposed by persons or organisations that do not hold a DOA.

2 For repairs approved by the other civil authorities, the conditions for acceptance is defined in 'Arrangements' with other civil aviation authorities. In the absence of such an arrangement, the repair data should follow the approval route of HKAR-21.

(b) REPAIR DESIGN APPROVAL BY THE DOA HOLDER

1 Approval by the DOA holder

Approval of repairs through the use of procedures agreed with the Director-General implies that the DOA holder issues the approval without Director-General's involvement. The Director-General will monitor the application of this procedure within the surveillance plan for the relevant organisation. When the organisation exercises this privilege, the repair release documentation should clearly show that the approval is issued on the basis of its privilege.

2 Previously approved data for other applications

When it is intended to use previously approved data for other applications, it is expected that an appropriately approved design organisation has checked the applicability and effectiveness of this data. After damage identification, if a repair solution exists in the available approved data, and if the application of this solution to the identified damage remains justified by the previously approved repair design (structural justifications still valid, possible airworthiness limitations unchanged), the solution may be considered to be approved and may be used again.

3 Temporary repairs

These are life-limited repairs to be removed and replaced by permanent repairs after a limited service period. These repairs should be classified under HKAR 21.435, and the service period should be defined when the temporary repair is approved.

4 Fatigue and damage tolerance

An approved design issued before the fatigue- and damage-tolerance evaluation has been completed should specify the limited service period.

HKAR 21.439 Production of repair parts

Parts and appliances to be used for the repair shall be manufactured in accordance with production data based upon all the necessary design data as provided by the repair design approval holder:

(a) Under Subpart F;

(b) By an organisation appropriately approved in accordance with Subpart G; or

(c) By an appropriately approved maintenance organisation.

HKAR 21.441 Repair embodiment

(a) The embodiment of a repair shall be made by an appropriately approved maintenance organisation, or an appropriately authorised person.

(b) The design organisation shall transmit to the organisation or person performing the repair all the necessary installation instructions.

HKAR 21.443 Limitations

A repair design may be approved subject to limitations, in which case the repair design approval shall include all necessary instructions and limitations. These instructions and limitations shall be transmitted by the repair design approval holder to the operator in accordance with a procedure agreed with the Director-General.

HKAR 21.445 Unrepaired damage

(a) When a damaged product, part or appliance, is left unrepaired, and is not covered by previously approved data, the evaluation of the damage for its airworthiness consequences may only be made:

1 by the Director-Genera; or

2 by an appropriately approved design organisation under a procedure agreed with the Director-General.

Any necessary limitations shall be processed in accordance with the procedures of HKAR 21.443.

(b) Where the organisation evaluating the damage under paragraph (a) is neither the Director-General nor the type certificate or supplemental type certificate holder, this organisation shall justify that the information on which the evaluation is based is adequate either from its organisation's own resources or through an arrangement with the type certificate holder, supplemental type certificate holder, or manufacturer, as applicable.

GM to HKAR 21.445 Unrepaired damage

This is not intended to supersede the normal maintenance practices defined by the type certificate holder, (e.g. blending out corrosion and re-protection, stop drilling cracks, etc.), but addresses specific cases not covered in the manufacturer's documentation.

HKAR 21.447 Record keeping

For each repair, all relevant design information, drawings, test reports, instructions and limitations possibly issued in accordance with HKAR 21.443, justification for classification and evidence of the design approval, shall:

(a) be held by the repair design approval holder at the disposal of the Director-General; and

(b) be retained by the repair design approval holder in order to provide the information necessary to ensure the continued airworthiness of the repaired products, parts or appliances.

AMC to HKAR 21.433 (b) and HKAR 21.447 Repair design and record keeping

(a) Relevant substantiation data associated with a new major repair design and record keeping should include:

1 the identification of the damage and the reporting source;

2 the major repair design approval sheet identifying the applicable specifications and references of justifications;

3 the repair drawing and/or instructions and scheme identifier;

4 the correspondence with the holder of the type certificate (TC) or supplemental type certificate (STC), if its advice on the design has been sought;

5 the structural justification (static strength, fatigue, damage tolerance, flutter, etc.) or references to this data;

6 the effect on the aircraft, engines and/or systems (performance, flight handling, etc., as appropriate);

7 the effect on the maintenance programme;

8 the effect on airworthiness limitations, the flight manual and the operating manual;

9 any weight and moment changes; and

10 special test requirements.

(b) Relevant minor repair documentation includes paragraph (a) 1 and 3. Other points of paragraph (a) may be included where necessary. If the repair is outside the approved data, a justification for the classification is required.

(c) Special consideration should be given to repairs that impose subsequent limitations on the part, product or appliance (e.g. engine turbine segments that may only be repaired a finite number of times, the number of repaired turbine blades per set, oversizing of fastener holes, etc.).

(d) Special consideration should also be given to life-limited parts and critical parts, notably with the involvement of the TC or STC holder, when deemed necessary under HKAR 21.433(a)4.

(e) Repairs to engine or APU critical parts would only be accepted with the involvement of the TC holder.

HKAR 21.449 Instructions for continued airworthiness

(a) The holder of the repair design approval shall furnish at least one complete set of those changes to the instructions for continued airworthiness which result from the design of the repair, comprising descriptive data and accomplishment instructions prepared in accordance with the applicable requirements, to each operator of aircraft incorporating the repair. The repaired product, part or appliance may be released into service before the changes to those instructions have been completed, but this shall be for a limited service period, and in agreement with the Director-General. Those changes to the instructions shall be made available on request to any other person required to comply with any of the terms of those changes to the instructions. The availability of some manual or portion of the changes to the instructions for continued airworthiness, dealing with overhaul or other forms of heavy maintenance, may be delayed until after the product has entered into service, but shall be available before any of the products reaches the relevant age or flight hours/cycles.

(b) If updates to those changes to the instructions for continued airworthiness are issued by the holder of the repair design approval after the repair has been first approved, these updates shall be furnished to each operator and shall be made available on request to any other person required to comply with any of the terms of those changes to the instructions. A programme showing how updates to the changes to the

instructions for continued airworthiness are distributed shall be submitted to the Director-General.

HKAR 21.451 Obligations and HPA marking

(a) Each holder of a major repair design approval shall:

1 undertake the obligations:

(i) laid down in HKAR 21.3A, HKAR 21.3B, HKAR 21.4, HKAR 21.439, HKAR 21.441, HKAR 21.443, HKAR 21.447 and HKAR 21.449; and

(ii) implicit in the collaboration with the type certificate or supplemental type certificate holder under HKAR 21.433(b), as appropriate; and

2 specify the marking, including HPA letters, in accordance with HKAR 21.804(a).

(b) Except for type certificate holders for which HKAR 21.44 applies, the holder of a minor repair design approval shall:

1 undertake the obligations laid down in HKAR 21.4, HKAR 21.447 and HKAR 21.449; and

2 specify the marking, including HPA letters, in accordance with HKAR 21.804(a).

(SUBPART N RESERVED)

SUBPART O HONG KONG TECHNICAL STANDARD ORDER (HTSO) AUTHORISATIONS

HKAR 21.601 Scope

(a) This Subpart establishes the procedure for issuing HTSO authorisations and the rules governing the rights and obligations of applicants for, or holders of, such authorisations.

(b) For the purpose of this Subpart:

1 'article' means any part and appliance to be used on civil aircraft.

2 'Hong Kong Technical Standard Order' (HTSO) is a detailed airworthiness specification issued or adopted by the Director-General to ensure compliance with the essential requirements of the Air Navigation (Hong Kong) Order 1995 as amended, and is a minimum performance standard for specified articles.

3 An article produced under a HTSO authorisation is an approved article for the purpose of Subpart K.

GM to HKAR 21.601 Hong Kong Technical Standard Order (HTSO) Article

In HKAR-21, 'HTSO article' refers to any part or appliance produced under a HTSO authorisation or any TSO article accepted by the Director-General.

AMC to HKAR 21.601(b)2 Acceptance of Technical Standard Order (TSO)

A TSO issued by other civil aviation authorities may be accepted by the Director-General.

Refer to the Cooperation Arrangement or Working Procedures/Arrangement between CAD and the respective authority in regards to the acceptance/validation of the product. The 'Arrangements' established with other civil aviation authorities are published in the Civil Aviation Department website.

HKAR 21.602A Eligibility

Any natural or legal person that produces or is preparing to produce a HTSO article, and that has demonstrated, or is in the process of demonstrating, its capability under HKAR 21.602B shall be eligible as an applicant for a HTSO authorisation.

HKAR 21.602B Demonstration of capability

Any applicant for a HTSO authorisation shall demonstrate its capability as follows:

(a) For production, by holding a production organisation approval, issued in accordance with Subpart G; and

(b) For design:

1 reserved;

2 for all other articles, by using procedures setting out the specific design practices, resources and sequence of activities necessary to comply with HKAR-21.

AMC to HKAR 21.602B(b)2 Procedures for HTSO authorisations

(a) **Scope**

A manual of procedures must set out specific design practices, resources and sequence of activities relevant for the specific projects, taking account of HKAR-21 requirements.

These procedures must be concise and limited to the information needed for quality and proper control of activities by the applicant/holder, and by the Director-General.

(b) **Management of the HTSO authorisation process**

A procedure explaining how the application to the Director-General and certification process to obtain a HTSO will be made, must be established.

(c) **Management of design changes**

A procedure taking into account HKAR 21.611, must be established for the classification and approval of design changes on articles under HTSO authorisation.

Procedure for the classification and approval of repairs and unintentional deviations from the approved design data occurring in production (concessions or non-conformance's) must be established.

(d) **Obligations addressed in HKAR 21.609**

The applicant should establish the necessary procedures to show to the Director-General how it will fulfil the obligations under HKAR 21.609.

For issue of information and instructions, a procedure following the principles of GM to HKAR 21.265(h) must be established.

(e) **Control of design subcontractors**

The applicant must establish the necessary procedures to show to the Director-General how it will control design sub-contractors.

HKAR 21.603 Application

(a) An application for a HTSO authorisation shall be made in a form and manner established by the Director-General and shall include an outline of the information required by HKAR 21.605.

(b) When a series of minor changes in accordance with HKAR 21.611 is anticipated, the applicant shall set forth in its application the basic model number of the article and the associated part numbers with open brackets after it to denote that suffix change letters or numbers (or combinations of them) will be added from time to time.

HKAR 21.604 Reserved

HKAR 21.605 Data requirements

(a) The applicant shall submit the following documents, to the Director-General:

1 a certification programme for the HTSO authorisation, setting out the means to demonstrate compliance with HKAR 21.606(b);

2 a statement of compliance certifying that the applicant has met the requirements of this Subpart;

3 a Declaration of Design and Performance (DDP), stating that the applicant has demonstrated that the article complies with the applicable HTSO in accordance with the certification programme;

4 a copy of the technical data required in the applicable HTSO;

5 the exposition (or a reference to the exposition) referred to in HKAR 21.143 for the purpose of obtaining an appropriate production organisation approval under Subpart G;

6 reserved; and

7 for articles other than APU, the procedures referred to in HKAR 21.602B(b)2.

(b) The applicant shall report to the Director-General any difficulty or event encountered during the approval process that may significantly impact the HTSO authorisation.

AMC to HKAR 21.605(a)1 Certification programme

(a) For the purpose of the compliance demonstration in accordance with HKAR 21.606(b), the applicant should:

1 establish a certification programme;

2 submit the certification programme to the Director-General; and

3 keep the certification programme updated during the authorisation process.

(b) The certification programme should contain the following information:

1 a detailed description of the relevant HTSO article, including all of its configurations to be certified, and the identification of HTSO and non-HTSO functions, if any;

2 the applicable HKAR-HTSO, in case of different minimum performance standard (MPS) available, the selected MPS, the other requirements and any optional aspects (applicable standards, applicable requirements, choice of classes (if applicable)) as well as the expected deviations;

3 the operating characteristics and the expected limitations;

4 the intended use of the article and the kind of operations for which the approval is requested;

5 the proposed means of compliance, including the list of documents and deliverables for the Director-General;

6 an overview of the safety assessment for the functions supported by the article, including the main failure conditions, their classification, the associated assumptions, and architectural features supporting the safety aspects;

7 the way in which the applicant will record the justifications of compliance; and

8 a project schedule, including major milestones.

GM to HKAR 21.605(b) Reporting from the compliance demonstration process and updates to the certification programme

The applicant should report to the Director-General any unexpected difficulty or event encountered during the compliance demonstration which invalidates or appreciably affects the assumptions previously made, e.g.:

(a) An increase in the severity of the consequences of a certain condition (e.g. a failure mode) of the article;

(b) One or more significantly reduced margins on the 'pass–fail' criteria of the compliance demonstration;

(c) An unusual interpretation of the results of the compliance demonstration;

(d) A deviation from the agreed means as defined in the certification programme; and

(e) Any potential deviations discovered by the applicant.

The applicant should also evaluate whether the unexpected difficulty or event encountered will impact on the certification programme and, if necessary, they should amend the certification programme per HKAR 21.603.

HKAR 21.606 Requirements for the issuance of a HTSO authorisation

In order to be issued a HTSO authorisation, the applicant shall:

(a) Demonstrate its capability in accordance with HKAR 21.602B;

(b) Demonstrate that the article complies with the technical conditions of the applicable HTSO or with deviations therefrom approved in accordance with HKAR 21.610 (if any);

(c) Comply with the requirements of this Subpart; and

(d) Declare that no feature or characteristic has been identified that may make the article unsafe for the uses for which certification is requested.

AMC to HKAR 21.606(d) Declaration

The related declaration should confirm that compliance with the applicable HTSO is successfully demonstrated and that all the assumptions, constraints, deviations, limitations, and open problem reports that are relevant for the approval of the installation are defined for both the HTSO and the non-HTSO functions.

Additionally, the applicant should demonstrate and declare that the non-HTSO functions do not interfere with the HTSO functions.

HKAR 21.607 HTSO authorisation privileges

The holder of a HTSO authorisation is entitled to produce and to mark the article with the appropriate HTSO marking.

HKAR 21.608 Declaration of Design and Performance (DDP)

(a) The DDP shall contain at least the following information:

1 information corresponding to HKAR 21.31(a) and (b), identifying the article and its design and testing standard;

2 the rated performance of the article, where appropriate, either directly or by reference to other supplementary documents;

3 a statement of compliance certifying that the article has met the appropriate HTSO;

4 reference to relevant test reports;

5 reference to the appropriate Maintenance, Overhaul and Repair Manuals;

6 the levels of compliance, where various levels of compliance are allowed by the HTSO; and

7 list of deviations accepted in accordance with HKAR 21.610.

(b) The DDP shall be endorsed with the date and signature of the holder of the HTSO authorisation, or its authorised representative.

AMC to HKAR 21.608 Declaration of Design and Performance

STANDARD FORM

DDP No. .....

ISSUE No. .....

(a) Name and address of manufacturer;

(b) Description and identification of article including:

1 Type No.;

2 Modification Standard;

3 Master drawing record; and

4 Weight and overall dimensions;

(c) Specification reference, i.e., HTSO No. and Manufacturer's design specification;

(d) The rated performance of the article directly or by reference to other documents;

(e) Particulars of approvals held for the equipment;

(f) Reference to qualification test report;

(g) Service and Instruction Manual reference number;

(h) Statement of compliance with the appropriate HTSO and any deviations therefrom; and

(i) A statement of the level of compliance with the HTSO in respect of the ability of the article to withstand various ambient conditions or to exhibit various properties.

The following are examples of information to be given under this heading depending on the nature of the article and the specifications of the HTSO:

1 Environmental Qualification;

i. Temperature and Altitude

ii. Temperature Variation

iii. Humidity

iv. Operational Shocks and Crash Safety

v. Vibration

vi. Explosion Proofness

vii. Waterproofness

viii. Fluids Susceptibility

ix. Sand and Dust

x. Fungus Resistance

xi. Salt Spray

xii. Magnetic Effect

xiii. Power Input

xiv. Voltage Spike

xv. Audio Frequency Conducted Susceptibility - Power Inputs

xvi. Induced Signal Susceptibility

xvii. Radio Frequency Susceptibility (Radiated and Conducted)

xviii. Emission of Radio Frequency Energy

xix. Lightning Induced Transient Susceptibility

xx. Lightning Direct Effects

xxi. Icing

xxii. Electrostatic Discharge

xxiii. Fire, Flammability

Note: The manufacturer should list environmental categories for each of the sections of the issue of EUROCAE ED-14/RTCA DO-160 that was used to qualify the article.

2 For radio transmitters the transmitting frequency band, maximum transmitting power, and emission designator;

3 Working and ultimate pressure or loads;

4 Time rating (e.g., continuous, intermittent) or duty cycle;

5 Limits of accuracy of measuring instruments;

6 Any other known limitations which may limit the application in the aircraft e.g., restrictions in mounting attitude.

(j) A statement of the software level(s) used or "None" if not applicable.

Note: Software levels (software development assurance levels (DAL)) are those defined in the industry document referred in the latest edition of EASA AMC 20-115).

(k) A statement of design assurance level for complex hardware or a statement indicating whether complex hardware is embedded or not in the product.

Note: Complex hardware design assurance levels are those defined in the applicable issue of EUROCAE ED–80/RTCA DO-254.

(l) The declaration in this document is made under the authority of

…… (name of manufacturer)

(Manufacturer's name) cannot accept responsibility for equipment used outside the limiting conditions stated above without their agreement.

Date: …… Signed …… (Manufacturer's authorised representative)

HKAR 21.609 Obligations of holders of HTSO authorisations

The holder of a HTSO authorisation under this Subpart shall:

(a) Manufacture each article in accordance with Subpart G that ensures that each completed article conforms to its design data and is safe for installation;

(b) Prepare and maintain, for each model of each article for which a HTSO authorisation has been issued, a current file of complete technical data and records in accordance with HKAR 21.613;

(c) Prepare, maintain and update master copies of all manuals required by the applicable airworthiness specifications for the article;

(d) Make available to users of the article and to the Director-General on request those maintenance, overhaul and repair manuals necessary for the usage and maintenance of

the article, and changes to those manuals;

(e) Mark each article in accordance with HKAR 21.807;

(f) Comply with points HKAR 21.3A, HKAR 21.3B and HKAR 21.4; and

(g) Continue to meet the qualification requirements of HKAR 21.602B.

HKAR 21.610 Approval for deviation

(a) Each manufacturer who requests approval to deviate from any performance standard of a HTSO shall demonstrate that the standards from which a deviation is requested are compensated for by factors or design features providing an equivalent level of safety.

(b) The request for approval to deviate, together with all pertinent data, shall be submitted to the Director-General.

HKAR 21.611 Design changes

(a) The holder of the HTSO authorisation may make minor design changes (any change other than a major change) without further authorisation by the Director-General. In this case, the changed article keeps the original model number (part number changes or amendments shall be used to identify minor changes) and the holder shall forward to the Director-General any revised data that are necessary for compliance with HKAR 21.603(b).

(b) Any design change by the holder of the HTSO authorisation that is extensive enough to require a substantially complete investigation to determine compliance with a HTSO is a major change. Before making such a change, the holder shall assign a new type or model designation to the article and apply for a new authorisation under HKAR 21.603.

(c) No design change by any natural or legal person other than the holder of the HTSO authorisation who submitted the statement of compliance for the article is eligible for approval under this Subpart O unless the person seeking the approval applies under HKAR 21.603 for a separate HTSO authorisation.

GM to HKAR 21.611 Design changes

A change to an HTSO article can either be seen:

(a) Under this HKAR 21.611 in the context of an HTSO authorisation, i.e., when an article as such is specifically approved under Subpart O, with dedicated rules that give

specific rights and obligations to the designer of the article, irrespective of any product type design or change to the type design. For a change to such an article, irrespective of installation on any aircraft, Subpart O, and this HKAR 21.611 in particular, should be followed; or

(b) When an airline or a maintenance organisation is designing a change (based on data not published in the TC holder or Original Equipment Manufacturer documentation) on an article installed on an aircraft, such a change can be considered as a change to the product in which the article is installed, not to the article taken in isolation. Therefore Subpart D can be used for the approval of this change that will be identified as 'change to product x affecting article y', but not 'change to article y'.

HKAR 21.613 Record keeping

Further to the record-keeping requirements appropriate to or associated with the quality system, all relevant design information, drawings and test reports, including inspection records for the article tested, shall be held at the disposal of the Director-General and shall be retained in order to provide the information necessary to ensure the continued airworthiness of the article and of the type certificated product in which it is fitted.

HKAR 21.615 Inspection by the Director-General

Upon a request of the Director-General, each applicant for, or holder of a HTSO authorisation for an article shall allow the Director-General to:

(a) Witness any tests; and

(b) Inspect the technical data files on that article.

HKAR 21.619 Duration and continued validity

(a) A HTSO authorisation will be issued for an unlimited duration. It shall remain valid unless:

1 the conditions required when HTSO authorisation was granted are no longer being observed; or

2 the obligations of the holder specified in HKAR 21.609 are no longer being discharged; or

3 the article has proved to give rise to unacceptable hazards in service; or

4 the authorisation has been surrendered or revoked under the applicable administrative procedures established by the Director-General.

(b) Upon surrender or revocation, the certificate shall be returned to the Director-General.

HKAR 21.621 Transferability

Except for a change in ownership of the holder, which shall be regarded as a change of significance, and shall therefore comply with HKAR 21.147 and HKAR 21.247 as applicable, a HTSO authorisation issued under HKAR-21 is not transferable.

(SUBPART P RESERVED)

SUBPART Q IDENTIFICATION OF PRODUCTS, PARTS AND APPLIANCES

HKAR 21.801 Identification of products

(a) The identification of products shall include the following information:

1 manufacturer's name;

2 product designation;

3 manufacturer's serial number; and

4 any other information the Director-General finds appropriate.

(b) Aircraft registered in Hong Kong shall bear marks in accordance with Part B of Schedule 1 to the Air Navigation (Hong Kong) Order 1995.

(c) Reserved.

(d) Reserved.

HKAR 21.803 Handling of identification data

(a) No person shall remove, change, or place identification information referred to in HKAR 21.801(a) on any aircraft, engine, propeller, propeller blade, or propeller hub, or in HKAR 21.807(a) on an APU without the approval of the Director-General.

(b) No person shall remove or install any identification plate referred to in HKAR 21.801, or in HKAR 21.807 for an APU, without the approval of the Director-General.

(c) By way of derogation from paragraphs (a) and (b), any natural or legal person performing maintenance work under the applicable associated Hong Kong Aviation Requirements may, in accordance with methods, techniques and practices established by the Director-General:

1 remove, change, or place the identification information referred to in HKAR 21.801(a) on any aircraft, engine, propeller, propeller blade, or propeller hub, or in HKAR 21.807(a) on an APU; or

2 remove an identification plate referred to in HKAR 21.801, or HKAR 21.807 for an APU, when necessary during maintenance operations.

(d) No person shall install an identification plate removed in accordance with subparagraph (c)2 on any aircraft, engine, propeller, propeller blade, or propeller hub other than the one from which it was removed.

HKAR 21.804 Identification of parts and appliances

(a) Each part or appliance shall be marked permanently and legibly with:

1 a name, trademark, or symbol identifying the manufacturer in a manner identified by the applicable design data;

2 the part number, as defined in the applicable design data; and

3 the letters HPA for parts or appliances produced in accordance with approved design data not belonging to the type certificate holder of the related product, except for HTSO articles.

(b) By way of derogation from paragraph (a), if the Director-General agrees that a part or appliance is too small or that it is otherwise impractical to mark a part or appliance with any of the information required by paragraph (a), the authorised release document accompanying the part or appliance or its container shall include the information that could not be marked on the part.

GM to HKAR 21.804(a)1 Data for identification of parts and appliances

It is not the intent of HKAR 21.804(a)1 to introduce an obligation for a production organisation (manufacturer) to mark new parts or appliances with information which is not identified by the design approval holder. Therefore, the physical marking of parts and appliances is only required when established by the design approval (TC, STC, HTSO, repair, change) holder.

The design approval holder is required to identify to the manufacturer how the marking in accordance with HKAR 21.804(a)1 should be done. This can be limited to identifying a marking field, possible depth and/or means etc., without prescribing the actual text or symbols to be used.

GM to HKAR 21.804(a)3 Hong Kong Parts Approval (HPA) marking for repair parts

The HPA marking only applies to the parts, specifically designed or modified for the repair, to be incorporated as part of the repair design. If the repair scheme does not require the addition of any new parts or the use of modified parts, there is no need to mark the repaired part with the letters ‘HPA’.

AMC to HKAR 21.804(b) Identification of parts and appliances

A design approval holder may apply HKAR 21.804(a) or make use of the derogation defined in HKAR 21.804(b) by clarifying, in the relevant procedures, the conditions (e.g. the minimum dimensions of a (flat) area on a part suitable for marking) in which the marking on the part may be completely or partially omitted. This can also be supported by examples of parts or cases when certain parts do not have to be marked.

In such cases, the relevant design data (e.g. drawings) should specify the contents and location of the information that could not be marked on the part (i.e. the information to be provided in the authorised release document or on the container).

HKAR 21.805 Identification of critical parts

In addition to the requirement of HKAR 21.804, each manufacturer of a part to be fitted on a type certificated product which has been identified as a critical part shall permanently and legibly mark that part with a part number and a serial number.

GM to HKAR 21.805 Continuous airworthiness management

For the purposes of HKAR 21.805, a part that requires individual traceability for the management of its continued airworthiness, as identified by the design approval holder, shall be permanently marked with a part number and a serial number.

The need for the design approval holder to identify and mark parts may be related to specific requirements for critical parts included in a certification specification.

For any part subject to an individually specified life limit or inspection requirement, it is also possible for that part to be removed from one serial number of the associated product during maintenance and installed on another serial number of the same product. In this case, the traceability of the part, which is necessary for continued airworthiness management purposes, is not assured through the serial number of the product alone, and it is necessary to maintain records for the part through its serial number.

HKAR 21.807 Identification of HTSO articles

(a) Each holder of a HTSO authorisation under Subpart O shall permanently and legibly mark each article with the following information:

1 the name and address of the manufacturer;

2 the name, type, part number or model designation of the article;

3 the serial number or the date of manufacture of the article or both; and

4 the applicable HTSO number.

(b) By way of derogation from paragraph (a), if the Director-General agrees that a part is too small or that it is otherwise impractical to mark a part with any of the information required by paragraph (a), the authorised release document accompanying the part or its container shall include the information that could not be marked on the part.

(c) Reserved.