CAD 360

AIR OPERATOR'S CERTIFICATES

Part One - Operation of Aircraft

CIVIL AVIATION DEPARTMENT HONG KONG JUNE 1997

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CHAPTER 1 - INTRODUCTION

1 PURPOSE

1.1 The purpose of this publication is to explain the administrative procedure for the issue and variation of Air Operators' Certificates (AOCs) and to indicate requirements to be met by applicants and certificate holders in respect of equipment, organisation, staffing, training and other matters affecting the operation of aircraft.

NOTE: For the purpose of this publication the term Operator is used to describe both Applicants and Certificate Holders. Where the term "Director" or "Director-General" appears, this refers to the Director-General of Civil Aviation.

2 APPLICABILITY

2.1 Operator certification and the associated requirements apply to a very wide range of activity, from short air taxi and pleasure flights to world-wide airline operations. In the statutory provisions few distinctions are drawn between small scale operations with light aircraft and major airline undertakings, for the basic principles of sound operating practice are essentially similar at all levels. Nevertheless, in the application of these principles and of certification requirements, it is possible and it is necessary to take account of the scale and scope of an operator's flying activity and particular circumstances. Operators may rest assured that the Civil Aviation Department (CAD) and its inspecting staff are fully conscious of this and in dealing with certification matters will always endeavour to adopt as flexible an approach as is consistent with the maintenance of adequate standards. Small scale operators of light aircraft should bear this particularly in mind when reading this publication.

2.2 In this publication the word 'must' or 'shall' are used to indicate where the Director expects the Operator to respond and adhere closely to the defined requirement. The word 'should' is used to indicate that the Operator has a degree of latitude, particularly where the nature of the operation affects the degree of compliance, but may not ignore the requirement. If the Operator's response is deemed to be inadequate by the Director, a specific requirement may be applied as a condition of the AOC.

3 THE STATUS OF AIR OPERATOR'S CERTIFICATES REQUIREMENTS DOCUMENT (AOCRD)

3.1 It is the policy of the Director to exercise his various discretionary powers by reference to certain documents with a view to ensuring effective implementation of International Civil Aviation Organisation (ICAO) standards. In order to ensure that all these ICAO standards are reflected in Hong Kong aviation legislation, the AOCRD is published in support of the powers of the Director contained in Article 6 of the Air Navigation (Hong Kong) Order 1995 (AN(HK)O) as amended.

3.2 Whereas the AOCRD is not law, and failure to comply with a provision in the AOCRD is not an offence, the AN(HK)O is law and therefore failure to comply with Article 6 "Issue of an air operators' certificate" is an offence. Article 6 of the Air Navigation (Hong Kong) Order 1995 (AN(HK)O), which is law and failure to comply with which is an offence, requires public transport flights to be conducted under and in accordance with an Air Operator's Certificate.

3.3 Article 6(2) sets out the matters in respect of which the Director must be satisfied before granting such a certificate. These matters are specified in the Order in rather general terms; for example, the Director is required to be satisfied with, among other things, an applicant's Organisation and other arrangements. The purpose of AOCRD is to augment and amplify the AN(HK)O. An applicant will, not unreasonably, wish to know what precisely he needs to do to satisfy the Director about these matters. The answer is essentially that he should comply with AOCRD.

3.4 It is not the case that failure to comply with every detail outlined in the AOCRD means that the Director will refuse to grant an AOC. Every application is considered on its merits. It is possible that failure to comply with a particular aspect of AOCRD will be counterbalanced in some way, thereby enabling the Director to be satisfied with the overall competence of the applicant.

3.5 Flight Operations Notices (FONs) are the medium used by the Director to communicate with operators on important aspects of operating policy, procedures or equipment that require immediate attention of the operators. AOCRD should be read in conjunction with FONs to ensure the effective implementation of the ICAO standards and local requirements. Compliance with both AOCRD and FONs is essential.

4 COMPLIANCE WITH STATUTORY REQUIREMENTS

4.1 The issue of a Certificate signifies only that the holder is considered 'competent to secure the safe operation' of the Operator's aircraft. It does not in any way relieve an operator or an aircraft commander of the responsibility for compliance with statutory requirements and for the safe conduct of a particular flight. International agreements and Hong Kong legislation are generally based on the concept that the ultimate responsibility for the safety of flight operations rests with the Operator and the commander. The issue of a Certificate and the work of the Civil Aviation Department (CAD) in that connection does not entail any departure from this general principle.

4.2 To a large extent the statutory requirements relating to the operation of aircraft are written in general terms. This is in accordance with the principle of "operator's responsibility" and helps to facilitate the development of the operating standards and techniques best suited to particular circumstances and conditions. The competence of an operator to 'secure the safe operation' of aircraft will therefore depend, in part, upon the manner in which he applies the statutory requirements to the particular operation. It is important, nevertheless, to appreciate that in the last resort the interpretation of the statutes is a function of the judiciary and that neither the issue of a Certificate nor the expression of any view in this publication should be taken as an indication to the contrary or as a modification of any statutory requirements.

5 AIRCRAFT MAINTENANCE

5.1 Requirements relating to aircraft maintenance arrangements are contained in the relevant parts of the Hong Kong Aviation Requirements (HKAR), Joint Aviation Requirements (JARs) and in AOCRD, Part Two - Arrangements for Maintenance Support'.

5.2 Operators are required to establish procedures for communication between their maintenance organisation(s) and their operational departments to ensure that maintenance and airworthiness matters, affecting the safe operation of the aircraft, are brought to the attention of aircraft crews.

6 INSPECTORS

6.1 Reference is made in the publication to Inspectors. Inspectors are authorised in accordance with the relevant statutory provisions and the conditions of Air Operators' Certificates to examine documents, premises and equipment, to enter and remain on the flight deck of an aircraft in flight and, if necessary, to issue directions to prevent aircraft flying. CAD will ensure the Inspectors are properly trained and qualified to perform the assigned duties.

6.2 The primary duty of the Inspectors is to ascertain facts and to report them; this duty must be fully discharged. However, it is their aim to work in close collaboration with operators and their staff to secure through regular discussion and exchange of views the highest possible standard of operational safety. It is expected that a relationship of mutual respect between Inspectors and the operator's officials, aircraft commanders and other aircraft crew members with whom they come into contact can be developed and maintained.

6.3 Inspectors are required to conduct routine inspection activities on the types of aircraft as listed on the Air Operator's Certificates (AOC). To ensure the Inspector's technical competence in all areas of regulatory oversight associated with flight operations, it is essential that Inspectors are type qualified and maintain a degree of currency on the procedures and equipment operated by the AOC holders. In this connection, arrangements will be made with the individual AOC holder for the assigned Inspector to obtain the type rating and/or operational currency, which may include line flying, simulator and ground training under the following scenarios:

(a) Introduction of new aircraft type in the company: Under this category, the corresponding AOC holder should provide type training for the new aircraft type to the Inspector, at the expense of the AOC holder. During the training, the Inspector will assess the course, the Flight Simulation Training Devices (FSTD), the instructors and the examiners. Any further recurrent flying and training will be negotiated and arranged through mutual agreement with the concerned AOC holder.

(b) Inspector assignment & re-assignment: To ensure impartiality, FSO Management shall assign inspecting staff to different airlines operators and the assignments should be reviewed every five years through a rotation system. Any extension of the assignment should be carefully justified and in no case the extension be more than one year. Hence a type training course, line flying and/or the related recurrent training for the newly assigned Inspector may be required. In such case, CAD will, again, negotiate with the corresponding AOC holder for a mutual agreement.

As the associated training cost is expected to be borne by the concerned operator, arrangement will only be confirmed when agreement is reached between CAD and the AOC holder.

6.4 Normally it will be acceptable that the Inspector is qualified on the type of aircraft concerned or on a type of aircraft with similar operational characteristics.

6.5 The requirements stated in paragraphs 6.3 and 6.4 above are established solely for the purpose of ensuring the efficiency of inspector's assessments on the performance of the operators. That said, in order to minimize the burden on the AOC holders in providing the type training, CAD will not, under normal circumstances, request for type training on a particular type/fleet again when:

(a) there is no change of assigned Inspector for the concerned type/fleet; or

(b) there is a change of assigned Inspector but within 36 months from the course completion of the previously assigned Inspector.

The above conditions may only be varied under unforeseen and/or justifiable circumstances and with explicit agreement from the concerned AOC holder.

7 AIR NAVIGATION (HONG KONG) ORDER

7.1 References in this publication to the Air Navigation (Hong Kong) Order 1995 and Regulations are to the Order and Regulations currently in force.

7.2 Exemptions, Permissions and Approvals issued under the AN(HK)O are usually valid for a finite period and have a notified expiry date. The AOC Holders are responsible for ensuring that their Exemptions, Permissions and Approvals remain valid, and should apply for re-validation well before time expiry.

7.3 Operations conducted under the conditions of an AN(HK)O Exemption, Permission or Approval that has lapsed, are in breach of the law.

7.4 Pursuant to Article 63 of AN(HK)O, no person shall with intent to make any false representation for the purpose of procuring for himself, or any other persons the grant, issue, renewal or variation of any such certificate, licence, approval, permission, exemption or other document under the Order.

8. DEFINITIONS

8.1 In this publication, and with the exception as stated in paragraph 8.2 of this Chapter, where a term is used which is defined in a relevant ICAO Annex or ICAO publication, that definition will apply. Specifically :-

(a) *Advanced aircraft.* An aircraft with equipment in addition to that required for a basic aircraft for a given take-off, approach or landing operation.

(b) *Aerodrome operating minima.* The limits of usability of an aerodrome for:

(i) Take-off, expressed in term of runway visual range and/or visibility and, if necessary, cloud conditions;

(ii) landing in 2D instrument approach operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions; and

(iii) landing in 3D instrument approach operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the type and/or category of the operation.

Note: Readers shall always refer to AN(HK)O if this definition is contradictory to any provision in AN(HK)O or any CAD documents.

(c) *Agreement summary.* When an aircraft is operating under an Article 83 *bis* agreement between the State of Registry and another State, the agreement summary is a document transmitted with the Article 83 *bis* Agreement registered with the ICAO Council that identifies succinctly and clearly which functions and duties are transferred by the State of Registry to that other State.

(d) *Aircraft operating manual.* A manual, acceptable to the State of the Operator, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aircraft systems and other material relevant to the operation of the aircraft.

Note: The aircraft operating manual is part of the operations manual.

(e) *Air traffic service (ATS).* A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

Note: Readers shall always refer to AN(HK)O if this definition is contradictory to any provision in AN(HK)O or any CAD documents.

(f) *Altimetry system error (ASE).* The difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude corresponding to the undisturbed ambient pressure.

(g) *Automatic deployable flight recorder (ADFR).* A combination flight recorder installed on the aircraft which is capable of automatically deploying from the aircraft.

(h) *Appropriate ATS authority*. The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

(i) *Basic aircraft.* An aircraft which has the minimum equipment required to perform the intended take-off, approach or landing operation.

(j) *COMAT*. Operator material carried on an operator's aircraft for the operator's own purposes.

(k) *Combined vision system (CVS).* A system to display images from a combination of an enhanced vision system (EVS) and a synthetic vision system (SVS).

(l) *Commercial air transport operation.* An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

Note: AN(HK)O uses the term "Public Transport", with the meaning specified in Article 98(6). Nevertheless, all relevant provisions in ICAO Annex 6 Part I applicable to Commercial Air Transport Operations are mandated for Hong Kong AOC holders carrying out Public Transport Operations through AN(HK)O or the corresponding CAD documents.

(m) *Contaminated runway.* A runway is contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed in the runway surface condition descriptors.

Note: Further information on runway surface condition descriptors for "slush" and "snow" can be found in the ICAO Annex 14, Volume I, Definitions.

(n) Continuous descent final approach (CDFA). A technique, consistent with stabilised approach procedures, for flying the final approach segment (FAS) of an instrument non-precision approach (NPA) procedure as a continuous descent, without level-off, from an altitude/height at or above the final approach fix altitude/height to a point approximately 15 m (50 ft) above the landing runway threshold or the point where the flare manoeuvre begins for the type of aircraft flown.; for the FAS of an NPA procedure followed by a circling approach, the CDFA technique applies until circling approach minima (circling OCA/H) or visual flight manoeuvre altitude/height are reached.

(n) *Cruise relief pilot/co-pilot.* A flight crew member who is assigned to perform pilot/co-pilot tasks during cruise flight, to allow the pilot-in-command or a co-pilot, as appropriate, to obtain planned rest.

(o) *Cruising level.* A level maintained during a significant portion of a flight.

(p) *Decision altitude (DA) or decision height (DH).* A specified altitude or height in a 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note: Readers shall always refer to AN(HK)O if this definition is contradictory to any provision in AN(HK)O or any CAD documents.

(q) *Dry runway.* A runway is considered dry if its surface is free of visible moisture and not contaminated within the area intended to be used.

(r) *Electronic flight bag (EFB).* An electronic information system, comprised of equipment and applications, for flight crew which allows for storing, updating, displaying and processing of EFB functions to support flight operations or duties

(s) *Enhanced vision system (EVS).* A system to display electronic real-time images of the external scene achieved through the use of image sensors. EVS does not include night vision imaging systems.

(t) *Fatigue.* A physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person's alertness and ability to perform safety-related operational duties.

Note: Readers shall always refer to the latest edition of CAD371 if this definition is contradictory to any provision or the intent of CAD 371.

(u) *Final approach segment (FAS).* That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

(v) *Flight plan.* Specified information relative to an intended flight or portion of a flight of an aircraft.

Current flight plan. The flight plan that reflects changes to the filed flight plan, if any, by subsequent ATC clearances.

Filed flight plan (FPL or eFPL). The latest flight plan as submitted by the pilot, an operator or a designated representative for use by ATS units.

Preliminary flight plan (PFP). The information related to a flight submitted by an operator or a designated representative to conduct collaborative planning of a flight, prior to filing a flight plan.

Note 1: The FPL denotes a filed flight plan exchanged using aeronautical fixed service while eFPL denotes a filed flight plan exchanged using Flight & Flow Information for a Collaborative Environment (FF-ICE) services. The eFPL allows for the exchange of additional information not contained within the FPL.

Note 2: The term flight plan may be prefixed by the words "preliminary", "filed", "current" or "operational" to indicate the context and different stages of a flight.

Note 3: When the word "message" is used as a suffix to this term, it denotes the content and format of the flight plan data as transmitted.

(w) Flight safety documents system. A set of interrelated documentation established by the operator, compiling and organising information necessary for flight and ground operations, and comprising, as a minimum, the operations manual and the operator's maintenance control manual.

(x) Flight simulation training device. Any one of the following three types of apparatus in which flight conditions are simulated on the ground:

A flight simulator, which provides an accurate representation of the flight deck of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc. aircraft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that type of aircraft are realistically simulated;

A flight procedures trainer, which provides a realistic flight deck environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc. aircraft systems, and the performance and flight characteristics of aircraft of a particular class;

A basic instrument flight trainer, which is equipped with appropriate instruments, and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions.

(y) Ground handling. Services necessary for an aircraft's arrival at, and departure from, an airport, other than air traffic services.

(z) Head-up display (HUD). A display system that presents flight information into the pilot's forward external field of view.

(aa) Human Factors principles. Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

(bb) Human performance. Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

(cc) Instrument approach operations. An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

(i) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and

(ii) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

Note: Lateral and vertical navigation guidance refers to the guidance provided either by:

(a) *a ground-based radio navigation aid; or*

(b) *computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.*

(dd) Instrument approach procedure (IAP). A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

(i) *Non-precision approach (NPA) procedure.* An instrument approach procedure designed for 2D instrument approach operations Type A.

Note 1: Readers shall always refer to AN(HK)O if this definition is contradictory to any provision in AN(HK)O or any CAD documents.

Note 2: Non-precision approach procedures may be flown using a continuous descent final approach technique (CDFA). CDFA with advisory VNAV guidance calculated by on-board equipment are considered 3D instrument approach operations. CDFA with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFA refer to PANS-OPS (Doc 8168), Volume I, Part II Section 5.

(ii) *Approach procedure with vertical guidance (APV).* A performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A.

(iii) *Precision approach (PA) procedure*. An instrument approach procedure based on navigation systems (ILS, MLS, GLS and SBAS Cat I) designed for 3D instrument approach operations Type A or B.

Note: Readers shall always refer to AN(HK)O if this definition is contradictory to any provision in AN(HK)O or any CAD documents.

(ee) Large aeroplane. Unless otherwise stated, an aeroplane of a maximum certificated take-off mass of over 5 700 kg.

(ff) Low-visibility operations (LVO). Approach operations in RVRs less than 550 m and/or with a DH less than 60 m (200 ft) or take-off operations in RVRs less than 400 m.

(gg) Maximum mass. Unless otherwise stated, maximum certificated take-off mass.

(hh) Minimum descent altitude (MDA) or minimum descent height (MDH). A specified altitude or height in a non-precision 2D instrument approach

operation or circling approach operation below which descent must not be made without the required visual reference.

Note: Readers shall always refer to AN(HK)O if this definition is contradictory to any provision in AN(HK)O or any CAD documents.

(ii) *Obstacle clearance altitude (OCA) or obstacle clearance height (OCH).* The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

Note 1: Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approach procedures to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach procedure is referenced to the aerodrome elevation.

Note 2: For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".

(jj) *Operational control.* The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

(kk) *Operational credit.* A credit authorized for operations with an advanced aircraft enabling a lower aerodrome operating minimum than would normally be authorized for a basic aircraft, based upon the performance of advanced aircraft systems utilizing the available external infrastructure.

(ll) *Operational flight plan.* The operator's plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.

(mm) *Operations manual.* In general, a manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Note: Readers shall always refer to AN(HK)O if this definition is contradictory to any provision in AN(HK)O or any CAD documents.

(nn) *Operations specifications.* The authorisations including specific approvals, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual.

(oo) *Performance-based aerodrome operating minimum (PBAOM).* A lower aerodrome operating minimum, for a given take-off, approach or landing operation, than is available when using a basic aircraft.

Note 1: The PBAOM is derived by considering the combined capabilities of the aircraft and available ground facilities. Additional guidance material on PBAOM may be found in the Manual of All-Weather Operations (Doc 9365).

Note 2: PBAOM may be based on operational credits.

Note 3: PBAOM are not limited to PBN operations.

(pp) Performance-based communication (PBC). Communication based on performance specifications applied to the provision of air traffic services.

Note: An RCP specification includes communication performance requirements that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

(qq) Performance-based surveillance (PBS). Surveillance based on performance specifications applied to the provision of air traffic services.

Note: An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

(rr) Point of no return. The last possible geographic point at which an aircraft can proceed to the destination aerodrome as well as to an available en-route alternate aerodrome for a given flight.

(ss) Pressure-altitude. An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere.

(tt) Required communication performance (RCP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

(uu) Required surveillance performance (RSP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

(vv) Safe forced landing. Unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

(ww) Small aeroplane. Unless otherwise stated, an aeroplane of a maximum certificated take-off mass of 5 700 kg or less.

(xx) Specific approval. A specific approval is documented in the Operations Specifications for commercial air transport operations or in the list of specific approvals for non-commercial operations. It can be in a form of an AN(HK)O Permission or Approval, as appropriate.

(yy) State of Registry. The State on whose register the aircraft is entered.

Note: In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International Operating Agencies which can be found in Policy and Guidance Material on the Economic Regulation of International Air Transport (Doc 9587).

(zz) State of the Aerodrome. The State in whose territory the aerodrome is located.

(aaa) Synthetic vision system (SVS). A system to display data-derived synthetic images of the external scene from the perspective of the flight deck.

(bbb) Target level of safety (TLS). A generic term representing the level of risk which is considered acceptable in particular circumstances.

(ccc) Total vertical error (TVE). The vertical geometric difference between the actual pressure altitude flown by an aircraft and its assigned pressure altitude (flight level).

(ddd) Wet runway. The runway surface is covered by any visible dampness or water up to and including 3 mm deep within the intended area of use.

8.2 The definitions in paragraph 8.1 of this Chapter will not apply when:

(a) The contrary is indicated; or

(b) There is a different definition in the Civil Aviation Ordinance (Cap. 448) or AN(HK)O.

8.3 Unless otherwise stated, "Minimum Safe Altitudes" in this document has the same meaning and applicability as "Minimum Flight Altitudes" which is specified in ICAO Annex 6, Chapter 4 Paragraph 4.2.7.

8.4 Differences to ICAO definitions and SARPs are identified in the Aeronautical Information Publication (AIP).

CHAPTER 2 - THE AIR OPERATOR'S CERTIFICATE

1 REQUIREMENT TO HOLD A CERTIFICATE

1.1 An aircraft registered in Hong Kong may not fly for the purpose of public transport otherwise than under and in accordance with the terms of an Air Operator's Certificate (AOC) granted to the operator by the Director-General of Civil Aviation, ('the Director-General').

1.1.1 In the case of an aeroplane the Maximum Total Weight Authorised of which exceeds 5700 kg, the aeroplane shall have no less than two power-units.

1.2 The term 'public transport' is defined in the Air Navigation (Hong Kong) Order and anyone in doubt as to whether particular flights may be made without the operator being the holder of a Certificate should seek legal advice. In relation to AOCs, the 'operator' is defined as the person for the time being having the management of the aircraft.

2 APPLICATION FOR A CERTIFICATE

2.1 An operator who has not previously held an AOC, or does not currently hold one, should apply on the appropriate form which is available from the Director-General of Civil Aviation. The issue of an AOC shall be dependent upon the operator demonstrating an adequate organisation, method of control and supervision of flight operations, training programme as well as ground handling and maintenance arrangements consistent with the nature and extent of the operations specified.

2.2 The application should be accompanied, if possible, by the relevant operations and training manuals (see Chapter 5) and should be submitted as far ahead as possible of the proposed date for the start of operations. The application should also include information on management organization structure and a listing of key staff members, including their titles, names, education and practical experience (in particular, the name, background and responsibility of the designated manager should be provided). The minimum notice required is **sixty days** from the date the **completed** operations and training manuals are received in the Civil Aviation Department. The interval between application and grant of a Certificate will depend primarily upon matters within the control of the operator and no undertaking can be given that the Director-General will be able to reach a decision within a particular period.

2.3 On receipt of the application an Inspector will be assigned to the applicant. The Inspector will carry out a detailed examination of the operations and training manuals and call for amendments where necessary. All aspects of aircraft operation, including the management structure, adequacy of ground and flying staff and arrangements for their training, premises, equipment and aircraft will be assessed in relation to the scale, scope and circumstances of the applicant's proposed operations. Manuals will be retained by the Director-General during the currency of the Certificate.

2.4 Where appropriate the application will be referred to the Chief, Airworthiness Standards for advice on the adequacy of the arrangements and facilities for aircraft maintenance. (See Part Two of this document).

2.5 One or more proving flights on the aircraft type for which application is made will normally be required, and will be observed by the assigned Inspector who will specify the route(s) to be flown.

2.6 Before providing any air service for hire or reward operators must ensure that they comply with the Air Transport (Licensing of Air Services) Regulations. The finance position and business plan would also be assessed by the authority. Information on permit and licence application procedures may be obtained from the Civil Aviation Department.

2.7 Operators shall also refer to the Aviation Security Ordinance (Cap. 494) for their statutory requirements to submit a security programme to the Aviation Security Authority under the Cap. 494. Operators may get in touch with the Security Section of the Civil Aviation Department for further advice.

2.8 Any person, while having dealings of any kind with the Civil Aviation Department (CAD), should not offer advantage to the CAD officers, or else he may commit an offense under section 4(1) and/or section 8 of the Prevention of Bribery Ordinance (Chapter 201 of Laws of Hong Kong), and be liable to a maximum penalty of a fine of $500,000 and imprisonment for 7 years.

3 FORM OF CERTIFICATE

3.1 Certificates will normally be granted for a period of two year, but other lesser periods may be specified at the discretion of the Director-General. The type(s) of aircraft that may be flown and the region in which operations may be conducted will be specified in the Certificate. Included in the Certificate will be General Conditions applicable to all holders, and Operations Specifications to be observed by a particular holder. The AOC and its associated General Conditions and Operations Specifications shall define the operations for which the operator is authorized, including specific approvals, conditions and limitations.

3.1.1 The following operations require specific approvals and/or permissions from CAD:

(a) operational credits for operations with advanced aircraft when used for low visibility operations;
(b) low visibility operations;
(c) extended diversion time operations;
(d) use of electronic flight bag;
(e) navigation specifications for PBN operations;
(f) reduced vertical separation minima operations; and
(g) carriage of dangerous goods.

3.2 A specimen Certificate is at Appendix A to this chapter. Typical AOC regions are shown on page 3 of the Certificate. However, an operator may apply for a region tailored to his proposed operation.

3.3 Operators should ensure that the General Conditions and Operations Specifications of their AOC are brought to the attention of their managerial and operating staff. The publication of a copy of the AOC in a relevant volume of the company operations manual will suffice in this respect.

4 APPLICATION FOR SECOND OR SUBSEQUENT CERTIFICATES

4.1 Holders requiring renewal of a Certificate should apply to the Director-General not more than 60 days prior to the expiry date. If the operator wishes the new Certificate to commence immediately upon the expiry of the old, the application must be submitted at least 30 days in advance of the expiry date.

5 VARIATION OF A CERTIFICATE

5.1 If the holder of a Certificate wishes to apply for the variation of a Certificate or Operations Specifications (e.g. inclusion of an additional aircraft type or extension of region) he should write to the Director-General of Civil Aviation giving full details of the proposed variation. The minimum notice required is 30 days. If the application is for the inclusion of an additional type of aircraft, the completed training and operations manuals (or additions to existing manuals) for the type should accompany the application. Detailed information will be required on arrangements for the maintenance of the aircraft, and for any necessary training and testing of crews.

5.2 At the initial stage of the application for the inclusion of an additional type of aircraft, the operator should provide a grand plan (e.g. a Gantt chart) with details regarding the action items, timeline, responsible persons/subject officers and status of the various tasks. In general, this plan should be presented in the meetings amongst all stakeholders, as a working documentation until the completion of the project. The operator should also provide a compliance matrix for the purpose of demonstrating the fulfilment of all relevant requirements in the Air Navigation (Hong Kong) Order 1995 (AN(HK)O) and this document. If the operator plans to employ third party for delivering training and testing, the way to qualify the third party check/training pilot with respect to the requirements of Schedule 9 and Schedule 11 to AN(HK)O should be provided.

5.3 On receipt of an application for a variation the Inspector assigned to the operator will normally make a special investigation which may include the requirement to observe a proving flight without revenue passengers on board. The assigned Inspector will specify the route(s) to be flown.

6 REFUSAL, REVOCATION ETC. OF A CERTIFICATE

6.1 Where an application for the grant or variation of an Air Operator's Certificate is refused, or is granted in terms other than those requested by the applicant, the reasons for denying the application will be given in writing.

6.2 Should it become necessary to revoke, suspend or vary a Certificate otherwise than on the application of the holder, notice of this, together with the reason for it, will normally be served on the operator. Exceptionally, a Certificate may be provisionally suspended, without notice, pending due inquiry into the case.

6.3 If an operator ceases operation for which the Certificate was issued, or if the Director-General revokes or suspends the Certificate, it must be returned immediately to the Director-General of Civil Aviation.

7 LEASED AIRCRAFT

7.1 Operations and airworthiness of non-Hong Kong registered aircraft under dry leasing arrangements.

Note: The lease of an aircraft without crew is referred to as a "dry lease". And in the context of this paragraph, a dry lease is a lease of an aircraft where the aircraft is operated under the AOC of a Hong Kong operator.

7.1.1 All dry leased aircraft will be subject to an Article 93 direction of the Air Navigation (Hong Kong) Order 1995 (AN(HK)O) as amended to the extent necessary to satisfy the Director-General as to the operational and airworthiness standards achieved.

7.1.2 The operator should provide the following information:

(a) type, serial number, registration and State of Registry of aircraft;
(b) the name and address of the registered owner;
(c) Certificate of Airworthiness and statement from the registered owner that the aircraft fully complies with the airworthiness requirements of the State of Registry;
(d) routes to be flown;
(e) reasons for the proposed arrangement;
(f) the period of the lease and whether or not it is proposed to put the aircraft on the Hong Kong register in the future;
(g) flight and cabin crew strength to cope with the additional aircraft and the corresponding crew training plan;
(h) flight and cabin training capability and the corresponding crew training plan;
(i) operational control;
(j) arrangements between lessor and lessee with respect to operations, engineering and maintenance;
(k) the design standard of the aircraft and, in particular, any failure to comply with the applicable Hong Kong Aviation Requirements (HKAR) for certification (Hong Kong Airworthiness Notice No. 74 should be referred to);
(l) the proposed arrangements for maintenance of the aircraft. The aircraft shall be maintained to the maintenance programme approved by the State of Registry;
(m) the responsibilities for signing the maintenance release. AD compliance and completion of maintenance programme tasks;
(n) copy of the lease agreement or description of lease provision;
(o) items of equipment not fitted or not in compliance with HKAR should be identified and exemptions applied for;

(p) the contact in the lessor's civil aviation authority dealing with the lease;
(q) a copy of the lessor's Maintenance Management Exposition or the equivalent, together with all amendments and/or revisions to it and shall incorporate in it such mandatory material as the State of Lessor may require; and
(r) insurance arrangements.

7.1.3 **Policy for airworthiness certification of dry leased aircraft**

7.1.3.1 Aircraft leased for up to one calendar year which have been built and maintained to the United States of America Federal Aviation Regulations (FAR), the Joint Aviation Requirements (JAR), or European Aviation Safety Agency (EASA) Implementation Rule (IR) will normally be accepted without modification, but see 7.1.3.4. below.

7.1.3.2 Aircraft leased for more than one calendar year will be required to be in compliance in all respects with HKAR, prior to entry into service.

7.1.3.3 Where a lease of less than one calendar year is altered to become valid for a period greater than one calendar year the aircraft is to be brought to HKAR standards as early as possible, and in all cases not later than one calendar year from the commencement of the original lease.

7.1.3.4 The Director-General reserves the right to require compliance with HKAR by any leased aircraft in specific circumstances. Operators should therefore consult the Director-General before entering into leasing arrangements.

7.1.3.5 Operators will be responsible for the reimbursement of all costs in relation to any investigations required by the Director-General with respect to applications to operate leased aircraft.

7.1.4 Where the dry leased aircraft is not identical with others of the type already being operated, the operator must include in the Operations Manual details of any special operating procedures; e.g. performance data. Crew may require appropriate training. Where the aircraft is not of a type already operated by the operator, a variation to the AOC must be sought.

7.1.5 Operators are reminded of noise regulations, which restrict the use of non noise-compliant aircraft and are advised to check that the aircraft satisfies Civil Aircraft (Aircraft Noise) Ordinance (CAP 312) before entering into any binding agreement.

7.2 **Operations and airworthiness of non-Hong Kong aircraft under wet leasing arrangements**

Note: The lease of an aircraft with flight crew provided is referred to as a "wet lease". And in the context of this paragraph, a wet lease is a lease of an aircraft where the aircraft is operated under the AOC of the lessor.

7.2.1 All wet leased aircraft will be subject to an Article 93 direction of the AN(HK)O to the extent necessary to satisfy the Director-General as to the operational and airworthiness standards achieved.

7.2.2 The applicant should provide the following information:

(a) type, serial number, registration and State of Registry of aircraft;
(b) the name and address of the registered owner;
(c) Certificate of airworthiness and statement from the registered owner that the aircraft fully complies with the airworthiness requirements of the State of Registry;
(d) routes to be flown;
(e) reasons for the proposed arrangement;
(f) the period of the lease and whether or not it is proposes to put the aircraft on the Hong Kong register in the future;
(g) operational control;
(h) arrangements between lessor and lessee with respect to operations;
(i) applicant's assessment on lessor's safety standards with respect to operations and maintenance;
(j) the design standard of the aircraft;
(k) the proposed arrangements for maintenance of the aircraft. The aircraft shall be maintained to the maintenance programme approved by the State of Registry;
(l) the responsibilities for signing the maintenance release. AD compliance and completion of maintenance programme tasks;
(m) copy of the lease agreement or description of lease provision;
(n) the contact in the lessor's civil aviation authority dealing with the lease;
(o) a copy of the lessor's Maintenance Management Exposition or the equivalent, together with all amendments and/or revisions to it and shall incorporate in it such mandatory material as the State of Lessor may require;
(p) insurance arrangements; and
(q) a confirmation from the lessor that they will copy any MOR/ASR to CAD when conducting wet leased flights on behalf of the lessee.

7.2.3 The design standard of the wet leased aircraft should be Hong Kong Type Certification standard or equivalent such as FAR, JAR or EASA Implementation Rule (IR). The maintenance standards should be equivalent to the HKAR standards.

7.2.4 In general terms, the Director-General anticipates that proposals to wet lease non-Hong Kong registered aircraft will only include aircraft that are within the current capability of a Hong Kong operator (the lessee) to properly handle and despatch. The Director-General will not accept an agreement for a wet lease to a Hong Kong operator unless the lessor's safety standards are equivalent to those required of the lessee.

7.2.5 Where the Director-General already has sufficient information about the lessor and the level of oversight exercised by the lessor's civil aviation authority is such that the equivalent safety standards are met, he will be able to accept the leasing agreement without additional work. Similarly where he has sufficient knowledge that the equivalent safety standards are not met, he will refuse the agreement without additional work.

7.2.6 Where the Director-General's knowledge of the lessor and/or the lessor's civil aviation authority is incomplete, the Director-General will normally, before accepting the agreement, carry out an audit to assure himself that equivalent safety standards are met by the lessor. The lessee will be charged the costs of the audit.

7.2.7 Once an audit has been satisfactorily completed, the Director-General will issue his permission. This permission will be valid for a maximum period of one year from the commencement of the lease. Should there subsequently be an application to extend the lease approval period, the Director-General will give due consideration to this, but may require that the lessor be re-audited, at the lessee's expense, to verify that equivalent safety standards are being maintained.

7.3 **Hong Kong registered aircraft operated by a non-Hong Kong operator (dry lease) for the purpose of public transport or aerial work**

7.3.1 The non-Hong Kong operator will have to comply with all parts of the AN(HK)O as amended relating to a Hong Kong registered aircraft, including holding an AOC under Article 6 of the AN(HK)O if public transport is intended, unless exempted therefrom by the Director-General. One pre-requisite for such exemption is that the Director-General has made satisfactory arrangements with the state of the non-Hong Kong operator for the transfer of ICAO Annex 6 responsibilities.

7.3.2 The non-Hong Kong operator will not be exempted from AN(HK)O Article 19, i.e. crews will need to hold appropriate Hong Kong licences or have their own national licences validated for which a charge will be levied.

7.3.3 In addition, the non-Hong Kong operator may require an exemption from certain provisions of the Civil Aviation Ordinance (CAP448).

7.3.4 The arrangements for maintenance and airworthiness management, during the period of the lease, should be defined by the Hong Kong operator (the lessor). Any modification required by the non-Hong Kong operator or civil aviation authority will require Director-General's approval.

7.3.5 In addition to the maintenance details, the Director-General will need to know:

(a) aircraft type and registration;
(b) name and address of the non-Hong Kong operator;
(c) period of lease including ferry flights, if these are done by the non-Hong Kong operator;
(d) routes on which the non-Hong Kong operator is proposed to use the aircraft;
(e) the number of non-Hong Kong pilots or flight engineers who require a Validation for their flight crew licence.
(f) operations control;
(g) arrangements between lessor and lessee with respect to operations, engineering and maintenance;
(h) insurance arrangement.

7.4 **Hong Kong registered aircraft operated by a Hong Kong operator (wet lease) on behalf of a non-Hong Kong operator**

7.4.1 The Hong Kong operator must inform the Director-General of such leases even if the operation is within the region currently authorised on their AOC. Matters such as variations to AOC regions or the use of the non-Hong Kong operator's cabin crew must be referred to the Director-General.

7.4.2 In addition to the maintenance details, the Director-General will need to know:

(a) aircraft type and registration;
(b) name and address of lessee;
(c) period of lease proposed;
(d) routes for the use of the aircraft;
(e) operational control;
(f) arrangements between lessor and lessee with respect to operations, engineering and maintenance;
(g) insurance arrangement.

7.5 Guidance material on maintenance aspects of aircraft lease may be found in the Appendix A to Chapter 10 of ICAO Document 9760 Volume II Part B.

7.6 A damp lease – aircraft is defined as a wet leased aircraft that includes a cockpit crew but not cabin crew.

7.6.1 All damp lease application will be treated similar to wet lease application detailed above with particular attention paid to training requirements for cabin staff.

8 ROUTINE LIAISON AND INSPECTIONS

8.1 During the currency of a Certificate periodic liaison and inspection visits of each operating base and the operators outstations will be made by Inspectors. Inspectors will also wish to visit handling agents appointed by the operator, both in Hong Kong and overseas. These checks are conducted to assess the suitability of an operator's organization, base facilities, overall standard of operation and level of compliance with statutory and operations manual requirements.

8.2 Flight inspections will also be carried out. The purpose of these checks is to assess the adequacy of the procedures established by the operator, and the facilities provided by him, to enable the crew to perform their duties both in the air and on the ground; to examine the standard of flight deck management and operation by the crew; and to assess the level of compliance with statutory and operations manual requirements. When required by the Inspector, the operator will provide a seat on the flight deck from which the Inspector can monitor the operation. (See General Condition (2) in Appendix A). Arrangements for such inspections will normally be made in advance but the right is reserved for Inspectors to board aircraft without prior notice.

8.3 The conduct of tests by CAD Authorized Examiners, and of crew training generally, will also be observed by Inspectors. The purpose of these inspections is to ensure that training and testing is in compliance with the operators training manual and within the terms and conditions of the appointment of CAD Authorized Examiners.

8.4 All Inspectors are 'authorized persons' for the purposes of the AN(HK)O, and are also authorized for the purposes specified in General Conditions (1), (2) and (3) of each Air Operators Certificate (see Appendix A). Inspectors carry an identity document which will be produced on request.

8.5 Operators are to ensure that all operating staff are fully informed of the foregoing.

8.6 No fee or fare will be paid in respect of the carriage of an Inspector on duty.

8.7 To keep the Director-General advised as to the continued adequacy of the aircraft maintenance and route stations support arrangements, Airworthiness Surveyors will make periodic checks of the facilities, and records, established by the operator, or his contracted maintenance organization.

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CHAPTER 2

APPENDIX A – SPECIMEN AIR OPERATOR'S CERTIFICATE

AIR OPERATOR'S CERTIFICATE		
民航處 CIVIL AVIATION DEPARTMENT	香港特別行政區政府 **THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION** 民航處 CIVIL AVIATION DEPARTMENT	
AOC #: 99 Issue #: 2 (Rev 0) Expiry date: 31-12-20xx	XYZ AIRLINES LIMITED Operator Address: XYZ Airlines Limited 99th Floor XYZ Building 99 XYZ District Hong Kong Telephone: (852) 1234 5678 Fax: (852) 1234 5678 E-mail: info@xyzairlines.com	OPERATIONAL POINTS OF CONTACT Contact details at which operational management can be contacted without undue delay are listed at page 2.
Pursuant to the Air Navigation (Hong Kong) Order 1995 (CAP 448C), this certificate certifies that XYZ Airlines Limited is competent to perform the public transport of passengers and cargo, as defined in the attached operations specifications, in accordance with the operations manual and CAP 448C. This certificate shall remain in force until 31 December 20xx unless previously revoked or suspended. The AOC # 99 previously issued is hereby revoked.		
Date of issue: December 20xx	Name and signature: **(Name)** Title: **Director-General of Civil Aviation**	

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GENERAL CONDITIONS

(1) Any person authorized by the Director-General of Civil Aviation in that regard shall have access to any premises in the occupation or control of the holder of this certificate for the purpose of examining the premises and any document, equipment, tools, material or other things of whatsoever nature, relating to the operation of aircraft thereunder kept or used or intended to be used in connection with the operation of the aircraft.

(2) Any person appointed by the Director-General of Civil Aviation to be an Inspector shall be permitted at any time to board and fly in any aircraft operated under this certificate, and to enter and remain on the flight deck; provided that the commander of the aircraft may refuse to allow the Inspector to enter or remain on the flight deck if, in his opinion, the safety of the aircraft would thereby be endangered.

(3) The holder of this certificate shall furnish to the Director-General of Civil Aviation a copy of every operations manual, training manual and of all other written instructions to his operating staff, for the time being in effect concerning the operation of the aircraft under this certificate.

(4) Every flight under this certificate shall be conducted in accordance with the relevant provisions of the aforesaid operations manual, training manual and instructions.

(5) The holder of this certificate shall give to the Director-General of Civil Aviation not less than 28 days' notice in writing of any intended change in the employment or cessation of the employment of a Contractor to maintain any of the aircraft or any part of its equipment, including its radio station, or any intended change in the duties of the Contractor in that regard.

(6) The holder of this certificate shall give to the Director-General of Civil Aviation not less than 14 days' notice in writing of the intended abolition of any of the following posts, or of any intended change in the person holding the post, or in his duties:-

Director
Chief
General Manager
Head
Officer
Other Posts

(7) This certificate shall not be valid during the continuance of the breach of any condition thereof; provided that a breach of a condition which relates only to a particular type of aircraft shall not render this certificate invalid in respect of any other type of aircraft.

OPERATIONAL POINTS OF CONTACT

Contact details of operational management that can be contacted, without undue delay for issues related to flight operations, airworthiness, flight and cabin crew competency, dangerous goods and other matters as appropriate.

Telephone:	(852) 1234 5678	Flight Operations Department
Fax:	(852) 1234 5678	
E-mail:	info@xyzairlines.com	

OPERATIONS SPECIFICATIONS
(subject to the approved conditions in the operations manual)

ISSUING AUTHORITY CONTACT DETAILS
Civil Aviation Department, Hong Kong Special Administrative Region Government

Telephone:	(852) 2910 6015 (Office)	Fax: (852) 2362 4250	E-mail: ops@cad.gov.hk
Mobile:	(852) 5328 6526 / 5328 6527	(Flight Operations)	
Mobile:	(852) 9095 2631 / 9023 0400	(Airworthiness)	

AOC #: 99 Operator's name: XYZ AIRLINES LIMITED

Date: December 20xx

(Name)
Director-General of Civil Aviation

Aircraft model: Airbus A330 series; Airbus A340 series; Boeing 747-400 series; Boeing 777-300 series

Type of operation: Public Transport ☒ Passengers ☐ Cargo ☐ Other N/A

Area(s) of operations:

Region A – Within the territorial boundaries of Hong Kong Special Administrative Region.

Region B – Within the area enclosed by rhumb lines joining successively the following points:

66°33'N	50°00'E
66°33'N	180°00'E
50°00'S	180°00'E
50°00'S	50°00'E
66°33'N	50°00'E

Region C – The area between the parallels of latitude 66°33'N and 50°00'S.

Flights within Regions A & B may be made with Airbus A330 series and Boeing 777-300 series aircraft.

Flights within Regions A, B & C may be made with Airbus A340 series and Boeing 747-400 series aircraft.

Special limitations:

(1) No flights shall be made by aircraft pursuant to this certificate:

(a) In an area specified in Schedule 8 of the Air Navigation (Hong Kong) Order 1995 (CAP 448C) except in accordance with an Approval of Navigation Equipment carried in the aircraft; and

(b) In the case of a twin-engined aeroplane if at any time during flight that aeroplane is more than 60 minutes flying time at its one-engine inoperative cruise speed from the nearest adequate aerodrome, save in accordance with the terms of a written Permission granted to the holder of this certificate under the Air Navigation (General) Regulations.

SPECIAL AUTHORIZATIONS	YES	NO	SPECIFIC APPROVALS	REMARKS
Dangerous goods	☒	☐		
Low visibility operations	☒	☐	Approach and landing CAT: IIIB RVR: 75 m DH: 0 ft for Airbus RVR: 100 m DH: 0 ft for Boeing	
	☒	☐	Take-off RVR: 150 m	
	☐	☒	Operational credits	
RVSM ☐ N/A	☒	☐		
EDTO ☐ N/A	☒	☐	Maximum diversion time: 180 minutes for Airbus XXX series	
	☒	☐	Maximum diversion time: 207 minutes for Boeing XXX series	
Navigation specifications for PBN operations	☒	☐	RNAV5	
	☒	☐	RNP AR APCH	
Electronic Flight Bag	☒	☐	XXX device portable EFB for Airbus XXX series	
	☒	☐	YYY device portable EFB for Boeing XXX series	
Continuing airworthiness			Managed by XYZ Airlines Limited in accordance with CAD 360 Part 2 Chapter 4	
Other	☒	☐	Approval of Navigation Equipment	
	☒	☐	Permission to use MEL	

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CHAPTER 3 - ORGANISATION AND FACILITIES

1. MANAGEMENT AND EXECUTIVE STAFF

1.1 A sound and effective management structure is essential to ensure the safe conduct of operations. It is particularly important that operational management should have proper status in the Organisation and be in suitably experienced and competent hands. The duties and responsibilities of managers and senior executives must be clearly defined in writing and chains of responsibility firmly established. The number and nature of the appointments will vary with the size and complexity of the Organisation. An excess of managers can lead to fragmentation of responsibility and control; this can result in as much difficulty and inefficiency as a shortage and a lowering of operational standards can easily follow. In general, the appointment of deputies for managerial posts should be kept to a minimum and particular care should be taken in defining their functions and responsibilities. The Director-General will wish to be satisfied that the management Organisation is adequate and properly matched to the operating network and commitments. Managers who are also undertaking flying duties must spend an appropriate amount of time on their ground duties. Leave and duty rosters must be arranged so as to ensure the continued presence of an effective operations management in Hong Kong.

1.2 *Nominated Post Holders / Key Personnel Positions*

1.2.1 The operator must have nominated post holders, who are acceptable to the Director-General and are responsible for the management and supervision of the following areas:-

(a) Accountable Executive
(b) Flight Operations
(c) Crew Training
(d) Maintenance Support
(e) Ground Operations
(f) Safety Management
(g) Quality Management

as a condition of the granting and continuance of the Air Operator's Certificate (AOC) and the positions held or the post titles will normally be listed in each AOC. Subject to the discretion of the Director-General, the operator may nominate additional key personnel other than those listed above for inclusion into the AOC conditions.

1.2.2 Nominated post holders listed in paragraph 1.2.1(b)-(g) above shall be required to attend an interview with CAD in order to assess the suitability for their intended role(s) within the AOC's management.

1.2.3 It is a condition of the AOC that the Director-General shall be given adequate notice of any intended change in appointments, designations, functions or responsibilities of these key personnel positions. When there is such a change, the revised management organisation structure and the listing of key personnel should also be provided to CAD for prior acceptance.

1.2.4 Nominations will be assessed independently. Previous acceptance of a person as a nominated post holder with one AOC holder does not imply automatic acceptance of nominated post holder with another AOC holder.

1.2.5 *Multiple Nominations*

1.2.5.1 Except for arrangement as may be agreed by the Director-General, no person should be appointed to take up more than one of these key personnel positions and/or for more than one Hong Kong AOC holder at the same time.

1.2.5.2 The acceptability of a single person holding several posts, possibly in combination with being the Accountable Executive, should depend upon the nature and scale of the operation. The two main areas of concern should be competence and an individual's capacity to meet his/her responsibilities.

1.2.5.3 As regards competence in different areas of responsibility, there should not be any difference from the requirements applicable to persons holding only one post.

1.2.5.4 The capacity of an individual to meet his/her responsibilities should primarily be dependent upon the scale of the operation. However, the complexity of the organisation or of the operation may prevent, or limit, combinations of posts which may be acceptable in other circumstances.

1.2.5.5 In most circumstances, the responsibilities of a nominated post holder should rest with a single individual. However, in the area of ground operations, it may be acceptable for responsibilities to be split as follows, provided that the lines of responsibilities for functions associated with the followings are clearly defined:

(a) Ramp Operations
(b) Passenger Services
(c) Baggage Services
(d) Cabin Services
(e) Weight and Balance Control
(f) Ground Support Equipment
(g) Fuel Services

1.2.6 *General Requirements*

1.2.6.1 Except where otherwise agreed by the Director-General, nominees to key personnel positions should be expected to possess the experience and meet the specific provisions that are listed in paragraphs 1.2.7 to 1.2.13 below and, in general, should have:-

(a) at least five years relevant work experience including a minimum of two years in the aeronautical industry in an appropriate position;

(b) Comprehensive knowledge of regulatory requirements, the operator's operational policies and practices;

(c) familiarity with management systems preferably in the area of aviation; and

(d) appropriate management experience.

1.2.6.2 Exceptionally, in particular cases, nomination that does not meet these provisions in full may still be acceptable to the CAD. In that circumstance, the nominee should demonstrate comparable experience and also the ability to perform effectively the functions associated with the position and with the scale of the operation.

1.2.7 *Accountable Executive*

1.2.7.1 The operator shall appoint and designate a person to function as the Accountable Executive, who:-

(a) has the authority for ensuring that all activities can be financed and carried out in accordance with the applicable requirements;

(b) when the Accountable Executive is not the Chief Executive Officer, the CAD should be assured that the Accountable Executive has direct access to the Chief Executive Officer and has the necessary air operations funding allocation;

(c) shall be responsible for establishing and maintaining an effective management system and, on behalf of the Organisation and irrespective of other functions, is responsible for the implementation and maintenance of the Safety Management System (SMS) and Quality Management System (QMS);

(d) has the authority to ensure the planning and allocation of resources necessary to manage safety and security risks to aircraft operations; and

(e) has overall accountability for ensuring operations are conducted in accordance with conditions and restriction.

1.2.7.2 Other Nominated Persons as prescribed in paragraph 1.2.1 under this Section shall be nominated by the operator, with the responsibility of ensuring that the operator remains in compliance with the applicable requirements. Such Nominated Person(s) shall be ultimately responsible to the Accountable Executive.

1.2.8 *Flight Operations*

1.2.8.1 The operator shall appoint and designate a nominated person to function as the responsible officer for the operator's flight operations matters, who:-

(a) has the authority for overseeing flight operations conducted under the AOC;

(b) should hold or have held a valid flight crew licence and the associated ratings appropriate to the operations conducted under the AOC. In case the nominated person's licence and ratings are not current, his/her deputy should hold a valid and current flight crew licence and the associated ratings.

1.2.9 *Crew Training*

1.2.9.1 The operator shall appoint and designate a nominated person to function as the responsible officer for the operator's crew training matters, who:-

(a) has the authority for overseeing crew training conducted under the AOC;

(b) should hold a current CAD Letter of Authority as an Authroised Examiner (Type Rating / Instrument Rating Examiner) on an aircraft type operated under the AOC; and

(c) should have a thorough knowledge of the operator's crew training concept for flight, cabin and (when relevant) other crew members under the AOC.

1.2.10 *Maintenance Support*

1.2.10.1 The operator shall appoint and designate a nominated person to function as the responsible officer for the operator's maintenance support matters including continuing airworthiness management, who:-

(a) has the authority for overseeing maintenance support of the aircraft under the AOC; and

(b) should possess:-

(i) a relevant engineering degree (Aeronautical, Mechanical, Electrical, Electronic, Avionic or other relevant studies), or experience as aircraft maintenance technician with additional education qualification acceptable to the Director-General; and

(ii) thorough familiarity with the organisations Maintenance Management Exposition, maintenance methods and aircraft type(s) to be operated under the AOC.

1.2.10.2 Where maintenance is performed by a contractor and not directly by the operator, a senior person employed by the operator should be nominated to co-ordinate arrangements and to provide continuous liaison with the contractor on airworthiness matters.

1.2.11 *Ground Operations*

1.2.11.1 The operator shall appoint and designate a nominated person to function as responsible officer for the operator's ground operations, who should possess thorough knowledge with ground operations conducted under the AOC.

1.2.12 *Safety Management*

1.2.12.1 The operator shall appoint and designate a nominated person to function as the Safety Manager for the operator's Safety Management System (SMS), who:-

(a) has the authority for overseeing SMS established under the AOC and would be assigned with the day-to-day management function of the SMS;

(b) has direct access to the Accountable Executive;

(c) should possess:-

(i) thorough knowledge with SMS operations; and

(ii) qualifications for a safety manager as required by the ICAO Safety Management Manual (ICAO Doc 9859) and the CAD 712 document.

1.2.13 *Quality Management*

1.2.13.1 The operator shall appoint and designate a nominated person to function as the Quality Manager (Operations) for the operator's Quality Management System (QMS), who:-

(a) has the authority for overseeing QMS established under the AOC and would be assigned with the day-to-day management function of the QMS;

(b) has direct access to the Accountable Executive;

(c) should possess:-

(i) thorough knowledge with QMS operations; and

(ii) qualifications for a quality manager as required in Appendix A to this chapter.

1.2.13.2 It is recommended that a corporate organisation responsible for an air transport undertaking should always maintain an internal audit procedure to ensure that operational safety levels are maintained throughout that undertaking.

2. ADEQUACY AND SUPERVISION OF STAFF

2.1 *Aircraft Crew*

2.1.1 It will be necessary for operators to satisfy the Director-General that they have a sufficient number of aircraft crews for the operations to be undertaken. The adequacy of the aircraft crews will not be assessed against a set formula, as there will clearly be a wide variation in requirements according to particular circumstances. In certain cases where the volume of work undertaken is small, the normal requirement concerning the number of aircraft crews employed may be relaxed. It is important that aircraft crews should generally be employed full-time under a contract of service.

2.1.2 Any staff movement that may affect the crew strength and lead to disruption in flight operations must be reported to the Director-General at least 28 days in advance. An assessment of the crew strength must then be made by the operator in order to ensure that the corrective actions are implemented on time.

2.1.3 Operators should develop and adopt the performance indicators for operational robustness of rosters to assess the stability of its rostering system. Performance indicators for operational robustness of rosters should at least measure how often rostered duties, including positioning and flight, for a duty period is achieved within the planned duration.

2.1.4 Flight crews should be aware of their individual responsibilities in relation to the legality and currency of any Flight Crew Licences and associated ratings and certificates held. Flying with an applicable element that is out of date in a licence is illegal and can invalidate insurance cover.

2.1.5 The employment of part-time or 'freelance' aircraft crews will be acceptable only in exceptional circumstances and in consultation with the assigned Inspector. Irrespective of whether crews are part-time or full-time employees, tests carried out to establish the competence of an operator's pilots, under Schedule 11 of the AN(HK)O, must be conducted either by the operator himself or by another operator under arrangements set out in detail in the company's Training Manual. These arrangements must ensure that the pilot is competent to perform all the duties and responsibilities laid upon him by the operator.

2.1.6 Flights over certain areas referred to in Schedule 8 of the AN(HK)O require the carriage of navigational equipment approved by the Director-General; such flights will not normally be permitted, unless the operator has the Director-General's approval for the use of navigational equipment.

2.1.7 Arrangements should be made for the supervision of all grades of aircraft crew by persons having the experience and qualities necessary to ensure the maintenance of high professional standards. This will necessitate such appointments as Chief Pilot, Flight or Fleet Manager and, in the larger organisations, Safety Officer and Chief Cabin Crew. The duties and responsibilities of these officials should be carefully defined and their flying commitments suitably restricted in order that they may have sufficient time for their managerial functions. If there are too many such appointments, they can create as many problems as they solve; the Director-General will be concerned only to verify that arrangements for the professional supervision of aircraft crews are properly related to the size and nature of the operator's Organisation.

2.1.8 Operators shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified in ICAO Annex 1.

2.1.9 Operators shall put in place procedures to ensure that flight crew members are not required to perform flying duties if they report themselves or are found to be under the influence of psychoactive substances that might have a negative impact on their capacity to carry out any safety-critical functions.

Note – Provisions concerning the use of psychoactive substances are contained in ICAO Annexes 1 and 2.

2.2 **Ground Staff**

2.2.1 *General*

2.2.1.1 The number of ground staff needed will depend primarily upon the nature and the scale of flight operations; the Director-General will take full account of the operator's particular circumstances. Operations and traffic departments, in particular, should be adequately staffed with trained personnel who have a complete understanding of the nature of their duties and responsibilities; this is specially important where the operator sub-contracts his ground handling to a third party.

2.2.2 *Ground Staff Training*

2.2.2.1 Operators are expected to provide training for ground staff; in particular those employed in operations and traffic departments. Special training in aviation security should be undertaken; a dangerous goods training programme following the current edition of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284) should be established. Further training will be necessary from time to time (e.g. when new types of aircraft are acquired) and the arrangements in this connection will be taken into account in the consideration of applications for the variation of Certificates.

3. FACILITIES

3.1 The nature and scale of office services required - clerical staff, typists, duplicating and printing machinery, etc. - should be related to the numbers of executive and other staff employed. It is particularly important that office services are sufficient to ensure that operational instructions and information of all kinds are produced and circulated to all concerned without delay.

3.2 In cases where the provision of printing facilities for manuals, manual amendments and other necessary documentation is not warranted by the size of the company, the operator must show that he has effective alternative arrangements.

4. ACCOMMODATION

4.1 Office space at each operating base must be sufficient to provide a suitable working environment for the number of operating staff employed. Adequate provision must be made for the traffic staff, for operational planning, for the storage and display of essential records, and for flight planning facilities for flight crews. If suitable flight planning facilities for flight crews are provided by the airport authority, the space provided by the operator can normally be reduced. However, it is essential that reasonable accommodation should be made available for crews to use before and between flights. A secluded area should be available to commanders for briefing and de-briefing of their crew.

5. OPERATIONS LIBRARY

5.1 The operator should maintain an adequate library of maps, charts, flight guides, operations manuals and other documents needed for reference and planning purposes, and for carriage in flight. The library should be kept in an orderly fashion and responsibility for its maintenance clearly defined.

5.2 Maps, charts, and flight guides held should cover the whole of the region for which the operator is, or wishes to be, certified.

5.3 Arrangements should be made for the amendment of manuals, documents and flight guides, and for bringing the amendments to the notice of flight crews and other operating staff concerned. A record should be kept of the distribution of manuals and amendments.

6. LEGISLATION AND AERONAUTICAL INFORMATION

6.1 The operator shall make available to all flight crews, and other operating staff who may be concerned, at their operating aerodrome, pre-flight aeronautical information essential for the safety, regularity and efficiency of air navigation and shall include but not be limited to the following :

(a) Hong Kong (or other local) NOTAMs;

(b) Hong Kong (or other local) AIP;

(c) The Air Navigation (Hong Kong) Order 1995 currently in force - amended to date;

(d) Aeronautical Information Circulars;

(e) Aeronautical Information Regulation and Control (AIRAC).

6.2 Where this information is readily available to crews in an AIS unit, it may not be necessary for the operator to duplicate the service, but it is nevertheless his responsibility to ensure that the information is available.

7. AIRCRAFT LIBRARY AND NAVIGATION BAG

7.1 There should be an effective system to ensure that aircraft are provided with an adequate library of manuals, maps and charts, flight guides and other necessary documents, supported by an efficient amendment service. Topographical maps are required for all flights conducted outside controlled airspace or under Visual Flight Rules (VFR). The scale of these maps should be appropriate to the operation undertaken. Checklists should be provided for making up the aircraft library and navigation bag; aircraft drill cards should include an item requiring libraries and navigation bags to be checked either before departure or, where there is no crew change, before the first flight of the day.

7.2 The operator shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the Director-General has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the equipment that will use them. The operator shall continue to monitor both process and products.

Note: Guidance relating to the processes that data suppliers may follow is contained in RTCA DO-200A/EUROCAE ED-76 and RTCA DO-201A/EUROCAE ED-77.

7.3 The operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aircraft that require it.

8. INSTRUCTIONS TO FLYING STAFF AND CREW NOTICES

8.1 Operations manuals, and other standing instructions must be supplemented by a systematic procedure for bringing urgent or purely temporary information to the notice of flying staff. This should be achieved by a numbered series of flying staff instructions or crew notices issued by or under the direct authority of a senior operations official. Periodical checklists should be issued to show which of these instructions are current. Full use should be made of these instructions to bring significant information concerning Circulars, NOTAMs, changes in operating minima, etc. to the attention of flight crews. Such notices and instructions to flying staff should be considered as part of the Operations Manual.

8.2 The operator shall ensure that all crew members, when abroad, are familiar with the relevant laws, regulations and procedures pertinent to the performance of their respective duties in the operation of the aircraft.

9. FORMS, DOCUMENTS AND RECORDS

9.1 Forms

9.1.1 An operator will need to provide various forms and records for use by his crews. Unless the use of such forms is self-explanatory, instructions for their completion should be included in the operations manual. The content and format of some documents, forms and records must be agreed by the Inspector. When this is necessary it will be mentioned in this document. If an operator is uncertain as to whether the format and content needs to be 'agreed' he is advised to contact the Operations Inspector before the forms are printed. Forms and records may be in electronic format as agreed with CAD.

9.2 Documents

9.2.1 Operators must ensure that instructions are issued and arrangements made to preserve the documents and records listed below for the period shown :-

Aircrew Proficiency Check Forms	- 2 years
Training Records	- 2 years
Flight Time, Flight Duty Period, Duty Period, Rest Period Records	- 1 year
Commander's Discretion Reports	- 1 year
Loadsheets	- 6 months
Commander's Flight Briefs	- 3 months
Flight Plans/Nav Logs	- 3 months
Fuel Howgozit/In Flight Records	- 3 months

Note : The periodic inspections referred to in Chapter 2 paragraph 8.1 may occur at intervals greater than the minimum period (listed above) that operators are required to preserve records. Operators should preserve records until such a periodic inspection has taken place, or advise the assigned Inspector when it is planned to discard them.

9.3 Records

9.3.1 Records must be kept for each member of the flying staff showing the dates on which tests, ratings, medical certificates, licences, etc., are due for renewal. There must also be an effective system to guard against flying staff being rostered for duty when periodic checks are overdue, and for verifying that licences have been renewed at the appropriate time. Operators are legally obliged to keep records of all training and tests and to make them available if necessary to other operators. Records should incorporate certificates indicating the competence of examinees to perform the duties in respect of which they have been tested. The form of record and certificates to be maintained must be agreed by the Director-General. The requirements regarding records to be kept with respect to flight crew duty and flight hours can be found in CAD 371.

9.4 **Records of Emergency and Survival Equipment Carried**

9.4.1 Operators shall at all times have available for immediate communication to rescue co-ordination centres, lists containing information on the emergency and survival equipment carried on board any of their aeroplanes engaged in international air navigation. The information shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

10. OPERATIONS QUALITY SYSTEM AND SAFETY MANAGEMENT

10.1 An operator shall establish an Operations Quality System by end of December 2018 and designate a Quality Manager to monitor the compliance with, and the adequacy of, procedures required to ensure safe operational practices. Compliance monitoring shall include a feedback system to the Accountable Executive to ensure corrective action as necessary.

10.2 An operator shall ensure that the Operations Quality System includes a Quality Assurance Programme that contains procedures designed to verify that all operations are being conducted in accordance with all applicable requirements, standards and procedures.

10.3 The Operations Quality System, and the Quality Manager, shall be acceptable to the CAD.

10.4 An operator shall describe the Operations Quality System in relevant documentations as outlined in Appendix A to this Chapter.

10.5 The air operator may also combine the Operations Quality System with the Safety Management System (SMS) as detailed in paragraph 10.6 to 10.13 below.

10.6 An operator shall implement a Safety Management System acceptable to the CAD that, as a minimum:

(a) identifies safety hazards and manages associated risks;
(b) ensures that remedial action necessary to maintain an acceptable level of safety is carried out;
(c) provides for continuous monitoring and regular assessment of the safety level achieved;
(d) aims to make continuous improvement to the overall level of safety; and
(e) submits safety performance indicators with respective alert/target levels to CAD for acceptance.

Notes: Guidance on Safety Management System is contained in the CAD 712 – "Safety Management System (SMS) For Air Operators, International Non-Public Transport Operators, Maintenance Organisations and Flying Training Organisations – A Guide to Implementation".

10.7 A Safety Management System shall clearly define lines of safety accountability throughout the operator's organisation, including a direct accountability for safety on the part of senior management.

10.8 An operator of an aeroplane of a maximum certificated take-off mass in excess of :

a) 27 000 kg; or

b) 15 000 kg with a passenger seating capacity greater than 19, and with a certificate of airworthiness first issued on or after 1 January 2027

shall be equipped with a means to support a flight data analysis programme as part of its safety management system.

Note: An operator may contract the operation of Flight Data Analysis Programme to another organisation while retaining overall responsibility for the maintenance of such a programme.

10.9 A Flight Data Analysis Programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.

Notes: i) Guidance on Flight Data Analysis Programme is contained in CAD 739 (Flight Data Monitoring – A guide to Implementation) and the ICAO Manual on Flight Data Analysis Programmes (FDAP) (Doc 10000).

ii) Legal guidance for the protection of information from safety data collection and processing systems is contained in Appendix 3 to ICAO Annex 19 (Second Edition).

10.10 An operator shall establish a Flight Safety Documents System, for the use and guidance of operational personnel, as part of its Safety Management System.

Note: Guidance on the development and organisation of a Flight Safety Documents System is provided in ICAO Annex 6 Part I (Amendment 41), Attachment F.

10.11 In order to decide whether or not to operate into airspace forecast to be, or aerodromes known to be, contaminated with volcanic ash, the operator should have in place an identifiable safety risk assessment within its Safety Management System.

Note: Guidance on the risk management of flight operations with known or forecast volcanic ash contamination is provided in ICAO Doc 9974 – Flight Safety and Volcanic Ash. Procedures recommended for use by pilots whose aircraft inadvertently encounter a volcanic ash cloud and for post-flight reporting can be found in ICAO Doc 9691 – Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds.

10.12 Operators shall submit a full audit report from either IATA Operational Safety Audit (IOSA), IATA Standard Safety Assessment (ISSA) or International Standard for Business Aircraft Operators (IS-BAO), as appropriate, every two years. Confidentiality will be strictly maintained by CAD. In addition, CAD will refrain from carrying out enforcement actions solely based on the contents of the audit report, except in cases involving dereliction of duty amounting to gross negligence or recklessness. Operators with practical difficulty in complying with this provision shall propose an alternative means of compliance for CAD's consideration.

10.13 Safety Management System shall contain an Emergency Response Plan (ERP). Operators shall also include a Family Assistance Plan (FAP) in its ERP, for the aircraft accident victims and their families.

Note: Further details and guidance can be found in CAD 712 (Safety Management Systems – A guide to Implementation), ICAO Doc 9859 (Safety Management Manual), ICAO Doc 9973 (Manual on Assistance to Aircraft Accident Victims and their families) and ICAO Doc 9998 (ICAO Policy on Assistance to Aircraft Accident Victims and their Families).

11. OCCURRENCE REPORTS

11.1 Responsibility for coordinating action on occurrence reports, mandatory or otherwise, and for initiating any necessary investigations should be assigned to a suitably qualified senior official with clearly defined authority and status.

11.2 Where appropriate, the circumstances of an incident should be made generally known within the operator's organisation and particular care should be taken to ensure that originators of occurrence reports are informed of the outcome of any subsequent investigations.

11.3 A special occurrence report form should be provided by the company. A format suitable for use by flight crew, airline engineering departments and maintenance organisations can be found at Part 2 Chapter 4 Appendix A.

12. NAVIGATION

12.1 Operators will be expected to supply, for the use of flight crews, navigation flight plan forms or prepared flight plan/logs to be used on all flights, except those sectors flown both regularly and of less than 45 minutes duration in Visual Meteorological Conditions (VMC) within a radius of 50 nm of the aerodrome and helicopter flights on-shore in VMC. The following entries in particular should be provided for:

- names of flight crew;
- flight number or other designation, date, aircraft type and registration;
- names of reporting and turning points together with codings and frequencies of radio aids; latitude and longitude should be included, if use is to be made of navigation systems;
- tracks and distances between reporting and turning points; tracks should be magnetic, unless true or grid are more appropriate to the nature of the flight, and designated magnetic, true or grid as required;
- route winds where appropriate;
- flight times between reporting and turning points;
- ETA, revised ETA and ATA at each reporting and turning point;
- minimum safe altitude for each stage of the flight;
- cleared cruising altitudes or flight levels;

- a brief and simple statement of the fuel requirement and the manner in which it was computed eg sector fuel, alternate fuel, contingency fuel and holding fuel, all shown separately;
- altimeter settings at point of departure and destination;
- airfield information used in performance calculations;
- information from meteorological broadcasts;
- if not maintained separately, a fuel log in which to record the in-flight fuel checks specified in Chapter 4 paragraph 8;
- space for noting ATC clearances;
- taxy, airborne, landing and engine-off times.

12.2 Operators should ensure that the forms are properly completed for each flight.

12.3 Operators should ensure that detailed instructions are specified on procedures to be adopted in setting up navigation systems. Such information should include:

- initialisation procedures;
- comparison of standard routes against flight plans;
- insertion of random routes;
- cross-checking of random route waypoints, tracks and distances;
- accuracy checks prior to entering areas where on-board navigation equipment cannot be monitored by external sources;
- gross navigation error checks;
- checks to be carried out after re-programming in flight;
- procedures to be followed in the event of navigation system failures.

13. COMMANDERS FLIGHT BRIEF

13.1 For flights on routes not normally flown, commanders should be provided with a detailed brief. The brief should include guidance on the schedule to be maintained and on all operational aspects of the voyage not fully covered in the operations manual, such as details of the routes to be flown, aircraft performance data, specific aerodrome operating minima for all aerodromes likely to be used, including alternates, and details of the navigation and terrain clearance procedures to be used.

14. DOCUMENTS TO BE CARRIED IN THE AIRCRAFT

14.1 Every aircraft under the management of operators shall carry the documents referred to in Schedule 12 of the AN(HK)O.

14.2 In addition, Operators shall also ensure that the following documents are carried in the aircraft:

(a) a certified true copy of the operator's AOC (or its equivalent document) which includes the Operations Specifications.

(b) if the aircraft carries passengers a list of passengers' names and places of embarkation and destination;

(c) if the aircraft carries cargo a manifest and detailed declarations of the cargo.

(d) the journey log book or equivalent record(s) which should contain the following and is kept for a period of 6 months after the date of the record:

(i) aircraft nationality and registration;

(ii) date;

(iii) names of crew members;

(iv) duty assignments;

(v) place of departure;

(vi) place of arrival;

(vii) time of departure;

(viii) time of arrival;

(ix) hours of flight;

(x) nature of flight;

(xi) incidents and observations (if any); and

(xii) signature of person in charge.

14.3 If the aircraft involves a lease arrangement a certified true copy of the approval of the lease agreement, shall be carried on board the aircraft.

14.4 If there is a transfer of functions and duties under an Article 83 *bis* Agreement, the Agreement itself and the agreement summary shall be transmitted to ICAO for registration. A certified true copy of the agreement summary, either in electronic or hard copy format, shall also be carried on board the aircraft. The agreement summary shall be made available to civil aviation safety inspector upon surveillance activities such as ramp checks. A sample agreement summary is at ICAO Annex 6 Part I Appendix 10.

15. RETENTION OF DOCUMENTS

15.1 Operators should conduct audits of returned flight documentation to provide an insight into the standard of operation being demonstrated by their crews. To facilitate these audits the following additional documents, if appropriate, which Inspectors will wish to examine as part of their routine inspection programmes, should be retained for a minimum of three months after the flight to which they pertain:

- take-off/landing data card - the 'bug card';
- navigation flight plan forms/PLOGs;
- fuel log;
- record of performance calculations;
- flight progress chart, where appropriate;
- commander's copy of the loadsheet.

15.2 In addition for EDTO flights,

- dispatch and en route weather; relevant NOTAMS.

CHAPTER 3 APPENDIX A – OPERATIONS QUALITY SYSTEM

In order to demonstrate compliance with Chapter 3, Section 10, an air operator should establish its Operations Quality System in accordance with the instruction and information contained in the following paragraphs.

1 GENERAL

1.1 Terminology

The terms used in the context of the requirement for an Operations Quality System have the following meaning:

(a) ***Accountable Executive*** The person acceptable to the CAD who is nominated by the operator as the Accountable Executive for the AOC.

(b) ***Quality Assurance*** Quality assurance, as distinguished from quality control, involves activities in the business, systems, and technical audit areas. It is a set of predetermined, systemic actions which are required to provide adequate confidence that a product or service satisfies quality requirements.

1.2 Quality Policy

1.2.1 An operator should establish a formal, written Quality Policy statement that is a commitment by the Accountable Executive as to what the Operations Quality System is intended to achieve. The Quality Policy should reflect the achievement and continued compliance with the regulations and requirements together with any additional standards specified by the operator.

1.2.2 The Accountable Executive will have overall responsibility for the Operations Quality System, including the frequency, format and structure of the internal management evaluation activities as prescribed in paragraph 3.9 below.

1.3 Purpose of the Operations Quality System

1.3.1 The Operations Quality System should enable the operator to monitor compliance with the regulations and requirements, the operator's Manual system, and any other standards specified by the operator, or the CAD, to ensure safe operations.

1.4 Quality Manager (Operations)

1.4.1 The function of the Quality Manager (Operations) to monitor compliance with, and the adequacy of, procedures required to ensure safe operational practices as required by the regulations and requirements may be carried out by more than one person by means of different, but complementary, Quality Assurance Programmes.

1.4.2 The primary role of the Quality Manager (Operations) is to verify, by monitoring activity in the fields of flight operations, crew training and ground operations, that the standards required by the CAD, and any additional requirements defined by the operator, are being carried out under the supervision of the relevant required management personnel.

1.4.3 The Quality Manager should be responsible for ensuring that the Quality Assurance Programme is properly established, implemented and maintained.

1.4.4 The Quality Manager should:

(a) report to the Accountable Executive;

(b) **NOT** be responsible for other key positions as listed on the AOC; and

(c) have access to all parts of the operator's organisation, and as necessary, any sub-contractor's organisation.

1.4.5 In the case of small operators, the posts of the Accountable Executive and Quality Manager may be combined.

2 OPERATIONS QUALITY SYSTEM

2.1 Introduction

2.1.1 The operator's Operations Quality System should ensure compliance with and adequacy of operational activities requirements, standards, and operational procedures.

2.1.2 The operator should specify the basic structure of the Operations Quality System applicable to its operation.

2.1.3 The Operations Quality System should be structured according to the size and complexity of the operation to be monitored.

2.2 Scope

2.2.1 As a minimum, the Operations Quality System should address the following:

(a) the provisions of the regulations and requirements;

(b) the operator's additional standards and operating practices;

(c) the operator's Quality Policy;

(d) the operator's organisational structure;

(e) responsibility for the development, establishment and management of the Operations Quality System;

(f) documentation, including Manuals, reports and records;

(g) quality procedures;

(h) Quality Assurance Programme;

(i) the required financial, material and human resources;

(j) training requirements; and

(k) Safety Management System programme.

2.2.2 The Operations Quality System should include a feedback system to the Accountable Executive to ensure that corrective actions are both identified and promptly addressed. The feedback system should also specify who is required to rectify discrepancies and non-compliance in each particular case, and the procedure to be followed if corrective action is not completed within an appropriate timescale.

2.3 Relevant Documentation

2.3.1 Relevant documentation includes the relevant part of the operator's Manual system.

2.3.2 In addition, relevant document should include the following:

(a) Quality Policy;

(b) terminology;

(c) specified operational standards;

(d) a description of the organisation;

(e) the allocation of duties and responsibilities;

(f) operational procedures to ensure regulatory compliance;

(g) the Quality Assurance Programme, reflecting:

(1) schedule of the monitoring process;

(2) audit procedures;

(3) reporting procedures;

(4) follow-up and corrective action procedures;

(5) recording system;

(6) the training syllabus; and

(7) document control.

3 QUALITY ASSURANCE PROGRAMME

3.1 Introduction

3.1.1 The Quality Assurance Programme should include all planned and systematic actions necessary to provide confidence that all operations are conducted in accordance with all applicable requirements, standards and operational procedures.

3.1.2 When establishing a Quality Assurance Programme, consideration should be given to at least the following:

(a) quality inspection;

(b) audit;

(c) auditors;

(d) auditor's independence;

(e) audit scope;

(f) audit scheduling;

(g) monitoring and corrective action; and

(h) management evaluation.

3.2 Quality Inspection

3.2.1 The primary purpose of a quality inspection is to observe a particular event/action/document, etc. in order to verify whether established operational procedures and requirements are followed during the accomplishment of that event and whether the required standard is achieved.

3.2.2 Typical subject areas for quality inspections are:

(a) actual flight operations;

(b) ground deicing/anti-icing;

(c) flight support services;

(d) load control;

(e) ground handling;

(f) technical standards; and

(g) training standards.

3.3 Audit

3.3.1 An audit is a systematic and independent comparison of the way in which an operation is being conducted against the way in which the published operational procedures say it should be conducted.

3.3.2 Audits should include at least the following quality procedures and processes:

(a) a statement explaining the scope of the audit;

(b) planning and preparation;

(c) gathering and recording evidence; and

(d) analysis of the evidence.

3.3.3 Techniques that contribute to an effective audit are:

(a) interviews or discussions with personnel;

(b) a review of published documents;

(c) the examination of an adequate sample of records;

(d) the witnessing of the activities that make up the operation; and

(e) the preservation of documents and the recording of observations.

3.4 **Auditors**

3.4.1 An operator should decide, depending upon the complexity of the operations, whether to make use of a dedicated audit team or a single auditor. In any event, the auditor or audit team should have relevant operational experience.

3.4.2 The responsibilities of the auditors should be clearly defined in the relevant documentation.

3.5 **Auditor's Independence**

3.5.1 Auditors should not have any day-to-day involvement in the area of the operation activity that is to be audited. An operator may, in addition to using the services of full-time dedicated personnel belonging to a separate Quality Department, undertake the monitoring of specific areas or activities by the use of part-time auditors. An operator whose structure and size does not justify the establishment of full-time auditors, may undertake the audit function by the use of part-time personnel from within its own organisation or from an external source under the terms of an agreement acceptable to the CAD. In all cases the operator should develop suitable procedures to ensure that persons directly responsible for the activities to be audited are not selected as part of the auditing team. Where external auditors are used, it is essential that any external specialist is familiar with the type of operation and/or maintenance conducted by the operator.

3.5.2 The operator's Quality Assurance Programme should identify the persons within the organisation who have the experience, responsibility and authority to:

(a) perform quality inspections and audits as part of ongoing quality assurance;

(b) identify and record any concerns or findings, and the evidence necessary to substantiate such concerns or findings;

(c) initiate or recommend solutions to concerns or findings through designated reporting channels;

(d) verify the implementation of solutions within specific timescales; and

(e) report directly to the Quality Manager.

3.6 **Audit Scope**

3.6.1 Operators are required to monitor compliance with the operational procedures they have designed to ensure safe operations and the serviceability of both operational and safety equipment. In doing so they should as a minimum, and where appropriate, monitor:

(a) organisation;

(b) plans and company objectives;

(c) operational procedures;

(d) flight safety;

(e) operator certification (AOC / Operations specifications);

(f) supervision;

(g) aircraft performance;

(h) All Weather Operations;

(i) communications and navigational equipment and practices;

(j) mass, balance and aircraft loading;

(k) instruments and safety equipment;

(l) Manuals, logs, and records;

(m) flight and duty time limitations, rest requirements, and scheduling;

(n) aircraft maintenance/operations interface;

(o) use of the Minimum Equipment List;

(p) flight crew;

(q) cabin crew;

(r) dangerous goods;

(s) security;

(t) training; and

(u) ground handling.

3.7 **Audit Scheduling**

3.7.1 A Quality Assurance Programme should include a defined audit schedule and a periodic review cycle area by area. The schedule should be flexible, and allow unscheduled audits when trends are identified. Follow-up audits should be scheduled when necessary to verify that corrective action was carried out and that it was effective.

3.7.2 An operator should establish a schedule of audits to be completed during a specified calendar period. All aspects of the operation should be reviewed within every 12 month period in accordance with the programme unless an extension to the audit period is accepted as explained below. An operator may increase the frequency of audits at its discretion but should not decrease the frequency without the agreement of the CAD. Audit frequency should not be decreased beyond a 24 month period interval.

3.7.3 When an operator defines the audit schedule, significant changes to the management, organisation, operation, or technologies should be considered as well as changes to the regulatory requirements.

3.8 **Monitoring and Corrective Action**

3.8.1 The aim of monitoring within the Operations Quality System is primarily to investigate and judge its effectiveness and thereby to ensure that defined policy, operational, and maintenance standards are continuously complied with. Monitoring activity is based upon quality inspections, audits, corrective action and follow-up. The operator should establish and publish a quality procedure to monitor regulatory compliance on a continuing basis. This monitoring activity should be aimed at eliminating the causes of unsatisfactory performance.

3.8.2 Any non-compliance identified as a result of monitoring should be communicated to the manager responsible for taking corrective action or, if appropriate, the Accountable Executive. Such non-compliance should be recorded, for the purpose of further investigation, in order to determine the cause and to enable the recommendation of appropriate corrective action.

3.8.3 The Quality Assurance Programme should include procedures to ensure that corrective actions are taken in response to findings. These quality procedures should monitor such actions to verify their effectiveness and that they have been completed. Organisational responsibility and accountability for the implementation of corrective action resides with the department cited in the report identifying the finding. The Accountable Executive will have the ultimate responsibility for resourcing the corrective active action and ensuring, through the Quality Manager, that the corrective action has re-established compliance with the standard required by the CAD, and any additional requirements defined by the operator.

3.8.4 **Corrective action**

Subsequent to the quality inspection/audit, the operator should establish:

(a) the seriousness of any findings and any need for immediate corrective action;

(b) the origin of the finding;

(c) what corrective actions are required to ensure that the non-compliance does not recur;

(d) a schedule for corrective action;

(e) the identification of individuals or departments responsible for implementing corrective action; and

(f) allocation of resources by the Accountable Executive, where appropriate.

3.8.5 The Quality Manager should:

(a) verify that corrective action is taken by the manager responsible in response to any finding of non-compliance;

(b) verify the corrective action includes the elements outlined in paragraph 3.8.4 above;

(c) monitor the implementation and completion of corrective action;

(d) provide management with an independent assessment of corrective action, implementation and completion; and

(e) evaluate the effectiveness of corrective action through follow-up process.

3.9 **Management Evaluation**

3.9.1 A management evaluation is a comprehensive, systematic, documented review by the management of the Operations Quality System, operational policies and procedures, and should consider:

(a) the results of quality inspections, audits and any other indicators; and

(b) the overall effectiveness of the management organisation in achieving stated objectives.

3.9.2 A management should identify and correct trends, and prevent, where possible, future non-conformities. Conclusions and recommendations made as a result of an evaluation should be submitted in writing to the responsible manager for action. The

responsible manager should be an individual who has the authority to resolve issues and take action.

3.9.3 The Accountable Executive should decide upon the frequency, format and structure of internal management evaluation activities.

3.10 **Recording**

3.10.1 Accurate, complete and readily accessible records documenting the results of the Quality Assurance Programme should be maintained by the operator. Records are essential data to enable an operator to analyse and determine the root causes of non-conformity, so that areas of non-compliance can be identified and addressed.

3.10.2 The following records should be retained for a period of 5 years:

(a) Audit schedules;

(b) Quality inspection and audit reports;

(c) Responses to findings;

(d) Corrective action reports;

(e) Follow-up and closure reports; and

(f) Management evaluation reports.

4 QUALITY ASSURANCE RESPONSIBILITY FOR SUB-CONTRACTORS

4.1 Sub-contractors

4.1.1 Operators may decide to sub-contract out certain activities to external agencies for the provision of services related to areas such as:

(a) ground deicing/anti-icing;

(b) maintenance;

(c) ground handling;

(d) flight support (including performance calculations, flight planning, navigation database and dispatch);

(e) training; and

(f) Manual preparation.

4.1.2 The ultimate responsibility for the product or service provided by the sub-contractor always remains with the operator. A written agreement should exist between the operator and the sub-contractor clearly defining the safety related services and quality to be provided. The agreement should include the operator's SMS requirements so that the sub-contractor understands the air operator's expectation from an operational safety perspective. The sub-contractor's safety related activities relevant to the agreement should be included in the operator's Quality Assurance Programme.

Operators should perform audits on their Ground Handling Service Providers (GHSPs) on both Landside and Airside on an annual basis; Operator and GHSP need to work closely together to ensure an integrated approach to operational safety. Operators with practical difficulty in complying with this provision should propose an alternate means of compliance for CAD's consideration.

Note: Further details and guidance can be found in ICAO Doc 10121, Manual on Ground Handling.

4.1.3 The operator should ensure that the sub-contractor has the necessary authorisation/approval when required and commands the resources and competence to undertake the task.

5 OPERATIONS QUALITY SYSTEM TRAINING

5.1 General

5.1.1 An operator should establish effective, well planned and resourced quality related briefing for all technical and operational personnel.

5.1.2 Those responsible for managing the Operations Quality System should receive training covering:

(a) an introduction to the concept of the Operations Quality System;

(b) quality management;

(c) the concept of quality assurance;

(d) Quality Manuals;

(e) audit techniques;

(f) reporting and recording; and

(g) the way in which the Operations Quality System will function in the company.

5.1.3 Time should be provided to train every individual involved in quality management and for briefing the remainder of the employees. The allocation of time and resources should be governed by the size and complexity of the operation concerned.

5.2 Sources of Training

5.2.1 Quality management courses are available from the various organisations and International Standards Institutions, and an operator should consider whether to offer such courses to those likely to be involved in the management of Operations Quality System. Operators with sufficient appropriately qualified staff should consider whether to carry out in-house training.

6 ORGANISATIONS WITH 20 OR LESS FULL-TIME EMPLOYEES

6.1 Introduction

6.1.1 The requirements to establish and document an Operations Quality System and to employ a Quality Manager apply to all operators. References to large and small operators elsewhere in the regulations and requirements are governed by aircraft capacity and by mass. Such terminology is not relevant when considering the scale of an operation and the Operations Quality System required. In the context of Operations Quality Systems therefore, operators should be categorised according to the number of full-time staff employees.

6.2 Scale of Operation

6.2.1 Operators who employ 20 or less full-time employees are regarded as "small" operators as far as Operations Quality System is concerned. Full-time in this context means employed for not less than 35 hours per week excluding vacation periods.

6.2.2 Complex Operations Quality System could be inappropriate for small operators and the clerical effort required to draw up Manuals and quality procedures for a complex system may stretch their resources. It is therefore accepted that such operators should tailor their Operations Quality System to suit the size and complexity of their operation and allocate resources accordingly.

6.3 Operations Quality System for Small Operators

6.3.1 For small operators it may be appropriate to develop a Quality Assurance Programme that employs a checklist. The checklist should have a supporting schedule that require completion of all checklist items within a specified timescale, together with a statement acknowledging completion of a periodic review by top management. An occasional independent overview of the checklist content and achievement of the quality assurance should be undertaken.

6.3.2 The small operator may decide to use internal or external auditors or a combination of the two. In these circumstances it would be acceptable for external specialists and/or qualified organisations to perform the quality audits on behalf of the Quality Manager.

6.3.3 If the independent quality audit function is being conducted by external auditors, the audit schedule should be shown in the relevant documentation.

6.3.4 Whatever arrangements are made, the operator retains the ultimate responsibility for the Operations Quality System and especially the completion and follow-up of corrective actions.

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CHAPTER 4 - OPERATIONS MANUAL

1 PURPOSE AND SCOPE OF MANUAL

1.1 The Air Navigation (Hong Kong) Order (AN(HK)O) requires the operator of every public transport aircraft registered in Hong Kong, with certain minor exceptions, to:

(a) make available an operations manual to each member of his operating staff;

(b) ensure that on each flight every member of the crew has access to a copy of every part of the operations manual which is relevant to his duties on the flight;

(c) ensure that each copy of the operations manual is kept up to date;

(d) provide the Director-General of Civil Aviation with a copy of the operations manual and any amendments or additions to it; and

(e) make such amendments or additions to the manual that the Director-General of Civil Aviation may require for the purpose of ensuring the safety of the aircraft or of persons or property carried in it, or the safety, efficiency or regularity of air navigation.

1.2 The operations manual shall contain "all such information and instructions as may be necessary to enable the operating staff to perform their duties". The AN(HK)O defines operating staff as "the servants and agents employed by the operator, whether or not as members of the crew of the aircraft, to ensure that the flights of the aircraft are conducted in a safe manner and includes an operator who himself performs these functions". The operations manual shall contain "a statement that the manuals comply with AN(HK)O and the AOC conditions and the corresponding operations specifications" and that the manuals are required to be complied with by all personnel.

1.3 The form and scope of manuals will vary considerably with the nature and complexity of the operator's organisation and types of aircraft in use. An operations manual shall be organized with the following structure, as provided in ICAO Annex 6 Part I Appendix 2:

(a) General;
(b) Aircraft operating information;
(c) Areas, routes and aerodromes; and
(d) Training

A "manual" may comprise a number of separate volumes and may well include individual forms, such as prepared navigation flight plans supplied by the operator to his crew. Instructions and information to particular groups of operating staff – e.g. traffic manuals, cabin crew manuals, crew rostering instructions and information on weight and balance supplied to handling agents - can all be regarded as part of the operations manual. Applicants will be required to lodge copies of their manuals and associated documents with the Civil Aviation Department (CAD) together with copies of all amendments and temporary instructions.

1.4 A list of particular matters to be covered in the operations manual is prescribed in the AN(HK)O. The purpose of this chapter is to give some indication of the manner in which the requirements relating to the operation of aircraft should be met. The Flight Manual forms part of the aircraft's Certificate of Airworthiness (C of A) and is therefore one of the documents which must be carried on the aircraft. Exceptionally Flight Manual information may be incorporated into the operations manual, and provided written permission is obtained from CAD, the Flight Manual need not be carried. In either case, the operator is responsible for ensuring that all such information is kept up-to-date on a regular basis. It is not sufficient for operators to rely solely upon the C of A renewal process to highlight deviations from the Flight Manual.

1.5 The operations manual will be regarded by CAD as a primary indication of the standards likely to be achieved by an operator. The operation of commercial aircraft is a highly complex matter requiring clearly defined standards and procedures. The form and scope of a manual will vary with the size of the undertaking but the basic principles remain the same.

1.6 Great importance will also be attached to the suitability of manuals for regular use by the operating staff and, in particular, by crews in flight. For all but the simplest of operations, the division of the manual into a number of separate volumes or parts will be essential. Manuals may be divided in such a way that essential information is immediately available on the flight deck; extracts or "digests" of information and instructions may sometimes be necessary to supplement drill cards and checklists. The design of the manuals shall observe Human Factors principles.

1.7 Each copy of a manual should normally bear a serial number and a list of holders should be maintained by the person responsible for issuing amendments. Where this system is not used, an operator should have satisfactory alternative arrangements for controlling the issue and amendment of manuals. A list of Volumes should be implemented in the administration and organization section of the manuals. Each volume of a manual should be numbered and bear a title and list of contents, giving a clear indication of its scope. The title of the person or department responsible for the issue of the manual should also be indicated. At the front of each volume there should be a list of effective pages and an amendment page to indicate amendment number, date of incorporation, signature or initials of the person amending. Amended pages should be dated. The numbering of pages, sections, paragraphs etc. should be orderly and systematic to facilitate immediate identification of any part of the subject matter. The standard of printing, duplication, binding, section dividers, indexing of sections, etc. should be sufficient to enable the document to be read without difficulty and to ensure that it remains intact and legible during normal use.

1.8 The amendment of a manual in manuscript will not be acceptable. Changes or additions, however slight, must be incorporated by the issue of a fresh or additional page on which the amendment material is clearly indicated. Amendments to operations manuals must not conflict with instructions in the aircraft Flight Manual. Managers should be appointed for responsibilities of manual contents, amendment and distributions.

1.9 It is most important for operators to appreciate that it is their responsibility under the relevant statutory provisions to provide adequate instructions and accurate information to their operating staff. Inspectors will check manuals lodged with CAD and will suggest amendments, where they appear to be necessary. The primary purpose of these checks will be to verify the adequacy of the operator's systems and procedures for keeping instructions and information under review and for issuing timely amendments, as necessary. There can be no question of CAD or its Inspectors assuming responsibility for the detailed information provided in manuals. This responsibility rests with the operator who should designate a suitably qualified person to see that it is properly discharged.

Note: For the purposes of the remainder of this Chapter it is assumed that readers are aware of the provisions of the AN(HK)O and associated regulations currently in force in respect of operations manuals and their contents.

1.10 Operations manuals and other standing instructions must be supplemented by a systematic procedure for bringing urgent or purely temporary information to the notice of operating staff and agents. This can be achieved by a numbered series of instructions or notices issued by or under the direct authority of a senior operations official. When the issue of a temporary instruction entails amendment of a standing instruction, the amendment must be made without undue delay and periodical checklists issued to show which of the temporary instructions are current. These instructions bring significant Aeronautical Information Circulars (AICs), NOTAMs, changes in Aerodrome Operating Minima (AOM) and NTAOCHs, for example, to the attention of crews, operating staff and the operator's agents.

2 CREW TO BE CARRIED

2.1 Generally only the minimum flight crew required by Article 18(3) of the AN(HK)O for public transport flights, need be specified for each type of aircraft. The minimum flight/cabin crew for public transport will not necessarily be the same as the minimum flight/cabin crew specified in the aircraft's Certificate of Airworthiness (Flight Manual). In some cases the operator will need to consider whether a particular circumstance of the operation, for example long range flights, calls for the carriage of additional crew. It is a statutory requirement that an aircraft shall have a flight crew "adequate in number and description" to ensure the safety of the flight.

2.2 Autopilot approved for the purposes of Article 18(3). This means an autopilot that is specified in the Flight Manual as approved for use with that aeroplane and capable of providing, as a minimum, both altitude and heading holds.

2.3 The claimed experience of potential employees must be substantiated. Log book entries must be checked to see if they are realistic and further checks made with flying clubs, previous employers and, if necessary, the Personnel Licensing Office where any doubt arises.

3 RESPONSIBILITIES OF AIRCRAFT CREW AND OTHER OPERATING STAFF

3.1 The operators shall establish an organization and management system for the operational control of all flights and maintain a method of control and supervision of flight operations.

3.1.1 The operator shall establish in its operations manual responsibilities for operational control and developed related policies, processes, standards and procedures.

3.1.2 In this context the term "operating staff", as distinct from the crew, means staff having specific duties, in relation to particular flights, which fall within the general pre-flight and in-flight responsibility of the aircraft commander. The manual should therefore define, where appropriate, the duties and responsibilities of people employed as:

(a) flight dispatchers/flight watch officers;
(b) flight planning assistants who prepare navigation flight plans and flight briefs, compute fuel requirements, Regulated Take-Off Weights (RTOWs) and aerodrome operating minima;
(c) rostering and scheduling staff;
(d) traffic officers or "loadmasters" responsible for calculating maximum payload and/or fuel uplifts or for supervising the loading of aircraft and completing load/trim sheets; and
(e) staff responsible for assisting the pilot-in-command in flight preparation, including the provision of relevant information, preparation of flight plans and submission to the appropriate ATS authority, and notifying the appropriate ATS authority when the position of the aeroplane cannot be determined by an aircraft tracking capability and attempts to establish communication are unsuccessful.

3.1.3 The operator shall develop policies and procedures for third parties that perform work on its behalf. Specifically, operators should clearly define in the operations manual the duties of operating staff responsible for ground handling functions including ramp operations, passenger services, baggage services, cabin services, weight and balance control, ground support equipment and fuel services. If any of the above-mentioned services are contracted out to a third party organization, this organization has to be audited by the concerned operator to confirm that the third-party organization is up to the required standards.

3.1.4 Each individual Ground Handling Service Provider (GHSP) should establish and maintain Standard Operating Procedures (SOP) for all activities it undertakes, including the use of facilities and equipment that enable service personnel to support the arrival and departure of aircraft. All SOPs should be included within the GHSP's operations manual and be complementary to the operators' manuals.

3.1.5 If any of the above-mentioned ground handling services are contracted out to a third party organization, this organization has to be audited by the concerned operator to confirm that the third-party organization is up to the required standards.

3.1.6 Operator should establish a schedule of audits to be completed during a specified calendar period. All aspects of the operation should be reviewed within every 12 month period in accordance with the programme unless an extension to the audit period is accepted. Operator may increase the frequency of audits at its discretion but should not

decrease the frequency without the agreement of CAD. Audit frequency should not be decreased beyond a 24 month period interval.

3.1.7 It is important in this connection that operating staff should be made fully aware of the over-riding responsibility and the ultimate authority of the aircraft commander. Manuals must state that in order to secure the safety of a particular flight the commander is authorised to apply greater safety margins e.g. aerodrome operating minima, fuel reserves and terrain clearance standards than those specified by the operator for normal operations.

3.2 In defining the duties of members of the crew, the operator should include instructions on:

(a) pre-departure briefings of flight crew and cabin crews (guidance on crew briefings are at Appendix I of this chapter);

(b) carriage of current documents (or copies thereof) as listed in Part 2 Chapter 4. Paragraph 25, and, for international air navigation, valid crew licences. Operators must ensure that crew are aware of the location of the AOC copy and the associated Schedule of Approvals and Permissions;

(c) the pilot-in-command's responsibility for the safety of all crew members, passengers and cargo on board when the doors are closed. The pilot-in-command shall also be responsible for the operation and safety of the aircraft from the moment the aircraft is ready to move for the purpose of taking off until the moment it finally comes to rest at the end of the flight and the engine(s) used as primary propulsion units are shut down. In particular, the pilot-in-command is responsible for the following;

(i) ensuring that the checklists for normal, abnormal and emergency procedures are complied with in detail prior to, during and after all phases of operations, and in emergency;

(ii) notifying the nearest appropriate authority by the quickest available means of any accident involving the aeroplane, resulting in serious injury or death of any person or substantial damage to the aeroplane or property;

(iii) reporting all known or suspected defects in the aeroplane to the operator at the termination of the flight; and

(iv) completing the journey log book.

(d) the briefing of passengers on emergency exits, procedures and equipment (including safety belts, harnesses and, where appropriate, life-jackets, automatic drop-out oxygen equipment and floor path lighting systems), restrictions on smoking and on the use of electronic equipment;

(e) the responsibility, in the absence of competent ground engineering staff, for supervising refueling and ensuring that filler caps, refueling valves, freight hold doors and other aircraft panels are secure;

(f) the responsibility for ensuring the correct completion of the technical log, before and after flight, where the flight crew are required to carry out day to day servicing of the aircraft, any pre-flight maintenance checks, ground de--icing or other special pre-flight servicing;

(g) the responsibility, in the absence of competent traffic staff, for supervising the loading of the aircraft;

(h) the duties of special personnel, e.g. animal attendants;

(i) the responsibility for taking precautions for the safety of passengers, when they are permitted to embark, disembark or to remain on board during fuelling operations;

(j) the responsibility, when an Auxiliary Power Unit (APU) is ground running and passengers are on board the aircraft or are in the process of embarking or disembarking, for ensuring that there are satisfactory arrangements for cabin crews to be warned immediately of any APU or other emergency condition which might require the rapid evacuation of passengers from the aircraft;

(k) limitations on the extent to which pilots, and cabin crews may be allowed to operate on more than one aircraft type or variant (see also Chapter 4 paragraph 5.3.21 and Chapter 5 paragraph 8);

(l) all flight crew members required to be on flight deck duty shall remain at their stations en route except when their absence is necessary for the performance of duties in connection with the operation of the aeroplane or for physiological needs;

(m) except where the flight crew is limited to one or two pilots, brief instructions should be included as to the order and circumstances in which command is to be assumed by members of the flight crew;

(n) guidelines for refuelling and loading by flight crews must be established;

(o) guidelines for evaluating and handling passengers with suspected communicable diseases by crews based on the presence of a fever (temperature 38 ºC/100 ºF or greater) with certain signs or symptoms (e.g. appearing obviously unwell; persistent coughing; impaired breathing; persistent diarrhea; persistent vomiting; skin rash; bruising or bleeding without previous injury; or confusion of recent onset) must be established. The procedures should include the transmission, as required, of a General Declaration form to the State authorities and reporting promptly of the suspected cases to Air Traffic Control with the following information;

(i) aircraft identification;

(ii) departure aerodrome;

(iii) destination aerodrome;

(iv) estimated time of arrival;

(v) number of persons on board;

(vi) number of suspected case(s) on board; and

(vii) nature of the public health risk, if known.

(p) the content and use of the operational flight plan; and

3.3 Crew members must not be under the influence of alcohol, drugs or medication during flying duty periods. Operators are to issue instructions to crews as to their personal responsibilities. They should include clear guidance on abstention from alcoholic drinks for a suitable period prior to duty. The minimum acceptable period will be eight hours but may need to be longer depending upon the amount of alcohol consumed. Aircraft crews should also be advised of the precautions to be taken if

they are taking medication.

3.4 Special consideration must be given to instructions on the allocation of duties between members of the flight crew at pre-flight and throughout all stages of flight. Operators are required to specify such procedures in detail in the form of Standard Operating Procedures (SOP), with particular reference to the division of duties during take-off and in the execution of an instrument approach procedure and missed approach procedure.

3.5 The procedure for an instrument approach in IMC should relieve the commander of as much work-load as possible, and through a proper division of duties and monitoring functions, provide adequate safeguards against errors or omissions. The difficulty of transition from instruments in poor visibility should be taken fully into account, together with the need for a clear and systematic procedure for initiating a missed approach if there is any doubt about the advisability of continuing the approach by visual reference to the ground.

3.6 The commander has ultimate responsibility for ensuring terrain clearance and in particular during radar vectoring for an instrument approach. Constant situational awareness must be maintained to ensure that terrain clearance is not jeopardized by unsafe ATC instructions.

4 FATIGUE MANAGEMENT

4.1 The regulations for the purpose of managing fatigue are prescribed in the AN(HK)O for compliance by the operators and the crew. In accordance with the AN(HK)O, an operator shall establish a scheme for the management of fatigue of all crew including any crew members carried in aircraft who are assigned with duties that have a direct bearing on flight safety, e.g. duties in the interests of passenger safety.

4.2 The requirements for operators to establish such schemes are contained in CAD 371 – "The Avoidance of Fatigue in Aircrews" and CAD 372 – Fatigue Management for Flight Crew Members, which includes requirements for operators to manage its fatigue-related safety risks through:

(a) flight time, fight duty period, duty period limitation and rest period requirements that are within the prescriptive fatigue management requirements prescribed in CAD 371, and

(b) a Fatigue Risk Management System (FRMS) for certain operations specified in CAD 372.

Note: Complying with the prescriptive fatigue management regulations does not relieve the operator of the responsibility to manage its risks, including fatigue-related risks, using its safety management system in accordance with the provisions of Annex19.

4.3 The operators' scheme for managing fatigue shall be designed in accordance with the ICAO Annex 6 Part I Appendix 7, Annex 6 Part III Appendix 6, CAD 371 and CAD 372. The scheme shall also be approved by CAD and be incorporated in the operations manual, which shall contain policies pertaining to the flight time, flight duty periods, duty period limitations and rest requirements for flight and cabin crew members, and policy and documentation pertaining to the operator's FRMS. Any amendment to the operations manual in this connection must be approved by CAD in advance.

4.4 The operations manual shall include the name of designated person or post who is a suitably qualified staff at a senior management level assigned by operator with the responsibility for issuing instructions and making decisions concerning the interpretation and application of an operator's approved scheme, and for processing commander's discretion reports. It shall also include comprehensive instructions and guidance as required by CAD 371 for all rostering, planning or scheduling staff.

4.5 While operators are required to comply with the prescriptive fatigue management requirements in CAD's approved scheme for part or all of its operations, the operators may, **in exceptional circumstances**, apply for a variation to the requirements of their approved scheme. Such variations may be either for a "one-off" voyage or for a series of flights. Any such application must include a detailed justification and risk assessment for the variation and all relevant supporting documents. Approved variations must provide a level of safety equivalent to, or better than the statutory provisions and CAD 371 requirements, and must be published in the operations manual and indicate expiry dates if applicable. Those of very limited duration may be published as crew notices or in a commander's brief.

4.6 Before the operator may apply FRMS to certain operations specified in CAD 371 to take the place of any of CAD's approved prescriptive fatigue management requirements, it must present the proposal in details to obtain CAD's agreement in writing. FRMS may be considered only when the operator can demonstrate to CAD that the proposed FRMS can provide a level of safety equivalent to, or better than the prescriptive fatigue management requirements. The operator shall implement the FRMS in accordance with ICAO Annex 6. The FRMS should be incorporated into the SMS where possible.

Note 1: Guidance for the integration of FRMS and SMS are described in the ICAO Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

Note 2: Further guidance on the protection of safety data, safety information and related sources are contained in ICAO Annex 19, Appendix 3 (Amendment 1).

4.7 Operators are required to maintain and provide legible records for each aircraft crew member of flight time, flight duty periods, duty periods, and rest periods for at least 12 months. It follows that suitable arrangements must exist for collecting the information necessary to compile the records. Accurate records are essential to persons responsible for the rostering of aircraft crews. These records should meet the requirements of CAD 371.

4.8 In the event of unforeseen circumstances which occur during operations where operators may need to request the aircraft commanders to exercise discretion to extend a flying duty period or, exceptionally, to reduce a rest period, the request shall be made and processed in accordance with CAD 371. Copies of reports by commanders on the exercise of discretion must be retained by the operator for a period of 12 months and contain at least all of the items specified in CAD 371.

4.9 Helicopter operators may have variations from the requirements of CAD 371. Approval could be granted if CAD is satisfied that they are appropriate for the applicant's operations.

4.10 Operators should remind all crew members that it is their responsibility to make

optimum use of the facilities for rest provided by the operator at outstations, and to plan their rest periods so as to minimise the risk of sleep deficit and cumulative fatigue.

4.11 It must be further brought to their attention that in accordance with the provisions of the AN(HK)O it is the responsibility of each crew member not to fly if he is suffering or is likely during flight to suffer from such fatigue as may endanger the safety of the aircraft and its occupants. It should be made clear that the provisions of this Article of the AN(HK)O are not intended to cover instances where normal tiredness resulting from the physical and mental effort of a flight is likely.

4.12 Operators should draw to the attention of flight crew that, in accordance with the provisions of the AN(HK)O, it is the responsibility of each flight crew member to notify anyone who employs his services as a flight crew member, of all flying he has undertaken within the previous 28 days, other than flying in an aircraft not exceeding 1600 kg maximum weight and not flying for the purpose of public transport or aerial work.

5 AIRCRAFT TECHNICAL PARTICULARS, PERFORMANCE AND OPERATING PROCEDURES

5.1 Technical Particulars of the Aircraft

In meeting the requirement to provide these, operators should take care to distinguish between specific information to be used in the course of flight operations and the more general basic information that a pilot might need to prepare for a type rating examination. If detailed descriptive matter is included as part of the manual, it should be in a separate volume. Information on the following matters, in particular, should be provided, as appropriate, in a form suitable for use as an immediate reference in day-to-day operations:

(a) action to be taken in the event of a system malfunction that cannot be covered by an emergency checklist. Information should be provided about the effect on essential systems and services of serious faults. Information to be provided will vary with the type of aircraft and, together with the emergency drills, it should be in a readily identifiable section of the manual, e.g. on distinctively coloured pages;

(b) operational guidance given on the actions required in the event of the failure of generated electrical power sources should include the capabilities and expected duration of the emergency or standby power sources, and advice on the effect that a failed attempt to start the APU will have on battery capability, if applicable. The operations manual should specify at what stage an aircraft should be diverted to an alternate aerodrome following a failure or combination of failures in the electrical system;

(c) guidance as to how commanders may operate a flight with uncertified rectification of defects and the methods to be used to report the circumstances, as required by the AN(HK)O, can be found in CAD 360 Part Two Chapter 8 paragraph 9;

(d) procedure for maintenance check 'A' or pre-departure inspection, as required by the approved maintenance schedule, including a check of the fuel system

for water contamination, where this is required to be carried out by the crew;

(e) replenishment of the aircraft's fuel, oil, hydraulic fluid, de-icing fluid, demineralised water and water methanol supplies to an approved specification. In the case of a helicopter, a maximum rotor running time must be specified, after which the helicopter must be shut down to enable engine and gear box oil level checks to be carried out. In the case of a rotors-running-refuel, a water contamination check should be made prior to the fuel uplift;

(f) supervising refueling and the topping up of tyres, oleos, de-icing and hydraulic systems, including oxygen and air reservoirs. The refueling information must include any specific precautions called for by:

(i) the use of wide cut fuels;

(ii) the 'off aerodrome' situation where either a fuelling vehicle or a barrelled supply is used; and

(iii) quality control which may, in appropriate circumstances, call for the flight crew to view the day's test fuel sample record or witness the sample test themselves.

(g) calculation of significant airspeeds and Mach numbers, reduced thrust and trim settings;

(h) manufacturer's and operator's limitations that affect the handling of engines and pressurisation systems;

(i) compliance with any special handling instructions; and

(j) procedures to be observed in the event of lightning-strike, bird-strike, heavy landing etc.

5.2 Performance

5.2.1 Operators must provide commanders with simplified performance information from which they can readily determine, without reference to a Flight Manual or performance schedule, the maximum weights for take-off and landing on all flights. The maximum weight referred to is that derived from the statutory weight and performance requirements or limitations, such as zero fuel weight. In many cases, on regular or scheduled operations, it is only necessary to indicate that there is no restriction imposed by performance requirements; in others, it may be necessary to indicate which of the requirements is critical and to provide a tabular or other clear presentation of limiting weights in varying conditions of wind and/or temperature. There will also be instances where it is both practicable and desirable for the operator to indicate any special flight procedures, such as minimum height for setting course in IMC or an emergency turn after take-off in the event of engine failure, essential to secure compliance with the performance requirements. Where applicable, clear instructions must be given for the calculation and selection of reduced thrust for take-off when specifically permitted by the Flight Manual.

5.2.2 Operators shall provide the necessary information for compliance with all flight profiles required by Schedule 15 Regulation 4 of the Air Navigation (Hong Kong) Order including but not limited to, the determination of:

(a) take-off runway length requirements for dry, wet and contaminated conditions,

including those dictated by system failures which affect the take-off distance;

(b) take-off climb limitations;

(c) en-route climb limitations;

(d) approach climb limitations and landing climb limitations;

(e) landing runway length requirements for dry, wet and contaminated conditions, including systems failures which affect the landing distance; and

(f) supplementary information, such as tire speed limitations.

Note 1: As Standard Instrument Departure (SID) routes do not guarantee adequate terrain clearance for all aircraft in the engine out case, the operator must check that the requirements of the appropriate regulations of Schedule 15 to AN(HK)O, are met for all SIDs used by company aircraft. Similarly any emergency turn after take-off on to routes contained in the aircraft's operations manual and approved for use by the local air traffic control must also have been checked for compliance with the above-mentioned Schedule 15. Operators shall take account of charting accuracy when assessing compliance with the relevant regulations.

Note 2: An approach to land shall not be continued below 300 m (1 000 ft) above aerodrome elevation unless the pilot-in-command is satisfied that, with the runway surface condition information available, the aeroplane performance information indicates that a safe landing can be made.

5.2.3 In addition to the performance requirements described in Schedule 15 Regulation 4 of AN(HK)O, account shall also be taken of other significant factors that may affect the performance of the aeroplane (e.g. surface conditions of the runway at the expected time of use i.e., presence of snow, slush, water, and/or ice). Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the aeroplane is being operated.

Note: Guidelines for using runway surface condition information on board aircraft and appropriate margins for distance assessment "at the time of landing" are contained in the ICAO Aeroplane Performance Manual (Doc 10064).

5.3 Operating Procedures

5.3.1 *Cockpit Resource Management.* Initial and recurrent training in Cockpit Resource Management (CRM) must be given to flight crews. Details of the CRM training syllabus must be included in the company training manual. Human factors training should be extended to cabin crews as appropriate, particularly where it can improve co-operation between cabin crews and flight crew during emergencies.

5.3.2 *Threat and Error Management (TEM).* SOP, Initial and Recurrent Training should cover TEM aspects which is an important element of CRM.

5.3.3 *Approach and Landing Accident Reduction (ALARS).* Operators should ensure that

their SOP and Initial and Recurrent training covers the guidance material given in the ALARS toolkit and should continue to review training syllabi in respect of CFIT accident reduction.

5.3.4 *Ground manoeuvring.* Procedures should cover the following:

(a) a means to ensure that cockpit procedures do not conflict with the necessity to maintain vigilance;

(b) emphasis on the importance of ensuring that the correct taxiway or runway is being used and of complying with Air Traffic Control (ATC) procedures. Full use should be made of ATC and visual aids;

(c) an appreciation that there may be differences in runway/ taxiway lighting and guidance systems between aerodromes in different regions and countries;

(d) the necessity to use standard and unambiguous Radio Telephony (RT) Transmissions and to verify instructions or clearances, whenever there is any doubt;

(e) the necessity to maintain vigilance in monitoring RT transmissions in order to determine the position of other traffic on the aerodrome;

(f) guidance on how to make the maximum use of aircraft lighting in order to be visible to others; and

(g) a reminder about the need for general awareness and the use of all flight deck resources.

5.3.4.1 *Runway Incursion.* Operators should also refer to the following documents, which refer to the prevention of runway incursion:

(a) Operators should refer to the ICAO Runway Safety Tool Kit and the ICAO manual for preventing runway incursion (see Appendix B in ICAO Doc 9870 AN/463) for further guidance.

(b) Hong Kong CAD Document titled 'Hong Kong Runway Safety Programme' and specifically Part 3 of the Document.

5.3.4.2 In the event of a runway incursion operators are to complete the form for reporting a runway incursion i.e. DCA 235.

5.3.5 *Operation on slippery runways.* Particular emphasis should be placed on handling techniques, crosswind limitations and any prohibition on movement, when the reported braking action is degraded below specified values.

5.3.6 *Take-off and landing on runways affected by snow, slush or water.* This section should explain how each of these contaminants may affect aircraft performance, especially acceleration and retardation, and should address the operation of engines, systems and lifting surfaces.

5.3.7 *Runway overrun.* The ability to stop effectively either during a rejected take-off or during a landing run as a result of runway contamination, crosswind, asymmetric considerations, tyre temperature or not using the full braking capacity of the aeroplane will be enhanced by both pilots sharing the workload.

5.3.8 *Increased Distance.* Methods of calculating increased distances inherent in operating from both wet and dry grass, where relevant.

5.3.9 *Minimum Equipment.* Allowances to be made for the effect of unserviceable devices eg flaps, reversers, spoilers or other equipment allowed in the Minimum Equipment List (MEL).

5.3.10 *Crosswind limits for take-off and landing.* It is not sufficient to repeat a statement in a flight manual that a particular crosswind component has been found to be acceptable; operators' limitations should be stated in unequivocal terms and account taken of the effect of gusts and surface conditions. Limits in excess of any figure mentioned in the flight manual will not be acceptable. Lower limits must be set to take account of contaminated runways or degraded handling characteristics due to system or power plant failure.

5.3.11 *Windshear.* Operators must be aware of the extremely hazardous and insidious nature of severe low level windshear resulting from various meteorological situations. Operators are to ensure that their operations and training manuals contain adequate instructions and guidance regarding severe low level windshear, with emphasis on avoidance of these conditions during take-off and landing.

5.3.12 *Wake Turbulence.* Information on spacing standards required to avoid wake turbulence at take-off and landing.

5.3.13 *Snow Banks.* Minimum strip width required after the clearance of snow, together with the maximum height allowed of associated snow banks.

5.3.14 *Ground Manoeuvring.* Maximum permissible wind velocities for taxying as well as take-off and landing.

5.3.15 *En-route Engine Failure.* Procedures to be followed on specific routes after failure of an engine, if the aircraft's stabilising altitude is likely to be critical in terms of Minimum Safe Altitude (MSA):

(a) Operators should be aware of the routes on which the en-route performance of their aircraft, following the failure of one or two engines, will be critical and should include instructions, relating to such routes, in their operations manuals in order to reduce the risks which could arise from indecision or error in the case of engine failure.

(b) In the case of critical routes it may, in some cases, be possible to regulate the aircraft's planned take-off weight to such an extent that its drift-down performance following engine failure (in the case of a turbine-engined aircraft from a height not exceeding the maximum re-light altitude) will enable it to clear all obstacles on its route by the required margin regardless of the point at which the failure occurs. In other cases it may be necessary to calculate a critical point, or a number of critical points, which would determine the action to be taken in the event of engine failure at any given position i.e. turn back, continue along the planned route or divert along an alternative route.

(c) Instructions should take into account the accuracy of navigation which may be expected of the flight crew in view of the crew complement and the aids available. Account should also be taken of the effect of varying meteorological conditions. Assumed winds and temperatures used in the calculation of the critical point(s) must be indicated because, if forecast or actual conditions differ from those used at the planning stage, the commander may need to amend the drift-down procedure.

5.3.16 *Noise Abatement.* Noise abatement regulations frequently require special handling techniques and routeings after take-off. The flight manuals of the more recently certificated aircraft contain performance data related to noise abatement procedures. Details of the procedures for any one aeroplane type should be the same for all airfields or runways used by the operator, for which noise abatement regulations exist, unless there are additional or alternative procedures required by local authorities or the operational circumstances preclude the use of the company's "standardised" noise abatement procedures. All these noise abatement procedures should be specified in the operations manual. In some cases these procedures may be more restrictive in terms of take-off weight than the Air Navigation (General) Regulations allow. Instructions to ignore noise abatement procedures in emergency situations should also be included. Where, in exceptional circumstances, it may be appropriate in the course of noise abatement procedures to start a turn at less than 500 feet above ground level (agl), pilots should be given suitable instructions about restricting the angle of bank. Pilots should also be instructed not to reduce thrust below 500 feet agl or to an extent that would result in a gross gradient of climb of less than 4%.

5.3.17 *Engine-out Ferry Flights.* Appendices D and E of this Chapter specify the conditions under which ferry flights with one engine inoperative can be undertaken with, details of the operating procedures to be followed and limitations to be applied.

5.3.18 *Ground Proximity Warning Systems (GPWS).* Operators must provide guidance in their operations manuals on the operation of aircraft that are required to carry GPWS equipment. Flight crew should be reminded that they must respond immediately to all alerts and warnings. A check of configuration as well as correct flight path should be made, since the GPWS might be quite correctly warning of an abnormal or unsafe landing configuration.

5.3.19 *Waterborne Operation.* For amphibious aircraft, performance information, training and certification must reflect both land and water operations. For aircraft capable of operating on the water, cross-wind limits for water operations and the limiting sea and swell states for take-off, en-route, (if appropriate e.g. single engine aircraft) and landing should be stated.

5.3.20 *Simulated Emergencies.* A statement must be made that simulated instrument flight and the simulation of emergency situations which might affect the flight characteristics of the aircraft or otherwise degrade safety standards, e.g. by affecting performance, are prohibited on passenger carrying flights.

5.3.21 *Multi-type Operation.* Where relevant, the policy in use for the crewing of aircraft, where more than one type or variant of aircraft is used must be stated. Pilots must not operate aircraft with significant differences in flight deck instrumentation, except by agreement with CAD.

5.3.22 *Co-pilots.* Detailed instructions should be included as to the circumstances in which co-pilots may be permitted to fly the aircraft e.g. lower cross-wind limits, higher operating minima.

5.3.23 *Winter operation.* All aircraft shall be equipped with suitable de-icing and/or anti-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered. A flight planned or expected to operate in suspected or known ground icing conditions shall not take off unless the aircraft has been inspected for icing and, if necessary, has been given appropriate de/anti-icing. Instructions should include:

(a) guidance on the completion of airframe ground de-icing/anti-icing, where this is required to be carried out or supervised by the flight crew, including fluid temperature and concentration and the likely duration of the de-icing effect in typical ambient temperatures (hold-over times);

(b) drills conforming to the flight manual and manufacturers' manual;

(c) operation of aircraft de-icing and anti-icing equipment.

5.3.24 *ACAS.* Procedures to be observed in response to ACAS advisories and alerts. In particular, procedures by which an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, may do so at a rate less than 8 m/sec or 1 500 ft/min (depending on the instrumentation available) throughout the last 1 000 ft of climb or descent to the assigned level when the pilot is made aware of another aircraft at or approaching an adjacent altitude or flight level, unless otherwise specified in an air traffic control instruction, to avoid unnecessary ACAS resolution advisories in aircraft at or approaching adjacent altitudes or flight levels.

5.3.25 *ATC Clearance*. Detailed instructions should be included on the clarification and acceptance of air traffic control (ATC) clearances, particularly where terrain clearance is involved. Operators shall instruct their "Operational Control" staff that in-flight operational instructions involving a change in the filed or current flight plan shall, when practicable, be coordinated with the appropriate ATS unit before transmission to the aeroplane.

Note : When the above coordination has not been possible, operational instructions do not relieve a pilot of the responsibility for obtaining an appropriate clearance from an ATS unit, if applicable, before making a change in flight plan.

5.3.26 *Stabilised Approach.* A stabilised approach is one of the key features of safe approaches and landings involving transport category aircraft. Operators are to include in their operations manual the minimum Height Above the Threshold (HAT) acceptable for a stabilised approach. At the minimum HAT published, the flight must be stabilised and all briefings and checklists completed. In all meteorological conditions, except special cases (i.e. circling, visual approaches in circuit pattern and some engine inoperative approaches etc.), the minimum HAT for a stabilised approach is to be no lower than 1000' HAT.

5.3.27 *Jettisoning fuel.* Procedures and precautions to be observed in order to jettison fuel.

5.3.28 *Rotors turning under power.* A helicopter rotor shall not be turned under its own power unless there is a qualified pilot at the controls.

5.3.29 *Refuelling of helicopters with passengers on board or rotors turning.*

Note: Except where otherwise stated, all helicopter refuelling provisions relate to operations using jet fuels. See 5.3.29(e) for restrictions specific to AVGAS/wide cut fuels.

(a) A helicopter shall not be refuelled, rotors stopped or turning, when:

(i) passengers are embarking or disembarking; or

(ii) when oxygen is being replenished.

(b) When the helicopter is refuelled with passengers on board, rotors stopped or turning, it shall be properly attended by sufficient qualified personnel, ready to initiate and direct an evacuation of the helicopter by the most practical, safe and expeditious means available. In order to achieve this:

(i) The flight crew shall ensure that the passengers are briefed on what actions to take if an incident occurs during refuelling;

(ii) A constant two-way communication shall be maintained by the helicopter's inter-communication system or other suitable means between the ground crew supervising the refuelling and the qualified personnel on board the helicopter; and

Note: Caution needs to be exercised when using radios for this purpose due to the potential for stray currents and radio-induced voltages.

(iii) During an emergency shutdown procedure, the flight crew shall ensure that any personnel or passengers outside the helicopter are clear of the rotor area.

(c) The operator shall establish procedures and specify conditions under which such refuelling may be carried out.

(d) In addition to 5.3.29(b) above, operational procedures should specify that at least the following precautions are taken:

(i) Doors on the refuelling side of the helicopter remain closed where possible, unless these are the only suitable exits;

(ii) Doors on the non-refuelling side of the helicopter remain open, weather permitting, unless otherwise specified by the RFM;

(iii) Fire-fighting facilities of the appropriate scale be positioned so as to be immediately available in the event of a fire;

(iv) If the presence of fuel vapour is detected inside the helicopter, or any other hazard arises during refuelling, fuelling be stopped immediately;

(v) The ground or deck area beneath the exits intended for emergency evacuation be kept clear;

(vi) Seat belts should be unfastened to facilitate rapid egress; and

(vii) With rotors turning, only ongoing passengers should remain on board.

(e) A helicopter shall not be refuelled with AVGAS or wide-cut type fuel or a mixture of these types of fuel, when passengers are on board.

(f) A helicopter shall not be defueled at any time when:

(i) Passengers remain on board; or

(ii) Passengers are embarking or disembarking; or

(iii) Oxygen is being replenished.

5.3.30 *Aircraft Tracking.*

(a) The operator shall establish an aircraft tracking capability to track aeroplanes throughout its area of operations.

(b) The operator shall establish procedures, approved by CAD, for the retention of aircraft tracking data to assist search and rescue in determining the last known position of the aircraft.

(c) The operator shall develop policies and procedures for third parties that perform aircraft tracking on its behalf.

(d) The operator shall track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) that is planned in an oceanic area(s) under the following conditions:

(i) the aeroplane has a maximum certificated take-off mass of over 45 500 kg and a seating capacity greater than 19; and

(ii) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.

(e) It is recommended that the operator should track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) under the following conditions:

(i) the aeroplane has a maximum certificated take-off mass of over 27 000 kg and a seating capacity greater than 19; and

(ii) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.

(f) Notwithstanding the provisions (d) and (e), CAD may allow variations to automated reporting intervals, based on the results of an approved safety risk assessment conducted by the operator which demonstrate how the risks can be

managed. The risk assessment shall include at least the following:

(i) capability of the operator's operational control systems and processes, including those for contacting ATS units;

(ii) overall capability of the aeroplane and its systems;

(iii) available means to determine the position of, and communicate with, the aeroplane;

(iv) frequency and duration of gaps in automated reporting;

(v) human factors consequences resulting from changes to flight crew procedures; and

(vi) specific mitigation measures and contingency procedures.

(g) The operator shall develop procedures to:

(i) monitor the aircraft tracking systems in use for their aircraft;

(ii) respond to any information received from such tracking systems in an appropriate manner; and

(iii) require that information received from an autonomous distress tracking system be forwarded to the location of an aircraft in distress repository (LADR).

Note 1: Oceanic area, for the purpose of aircraft tracking, is the airspace which overlies waters outside the territory of a State.

Note 2: Refer to ICAO Annex 11, Chapter 2, for coordination between the operator and air traffic services providers regarding position report messages.

Note 3: Guidance on aircraft tracking capabilities and development, implementation and approval of risk assessment process is contained in the Aircraft Tracking Implementation Guidelines (Cir 347).

Note 4: Guidance on aircraft and distress tracking is contained in PANS-OPS (Doc 8168), Volume III – Aircraft Operating Proceures.

6 PROVISION AND USE OF OXYGEN AND ASSOCIATED EQUIPMENT

6.1 The statutory requirements regarding the carriage of oxygen and oxygen equipment are laid down in Schedule 5 to the AN(HK)O. The requirements are complex, and therefore clear information and instructions must be included in the operations manual to enable a commander to verify that the minimum acceptable oxygen quantity or pressures and associated equipment is carried. Guidance must also be given on the use of the equipment.

6.2 The instructions should include the procedures and routes to be adopted, when necessary, to ensure that a safe operating altitude can be quickly achieved. Due

account should be taken of such variables as the amount of oxygen available and the time likely to be spent at an intermediate altitude at which the use of oxygen will be required.

6.3 If oxygen is not carried or if an aircraft is not correctly equipped, either temporarily or permanently, instructions on restricting operating altitudes and/or routes must be included.

7 MINIMUM EQUIPMENT LISTS

7.1 Operators shall not operate aircraft with unserviceable equipment, except under the terms of Permission granted under Article 14A from the relevant Articles of the AN(HK)O granted by the Director-General of Civil Aviation. Such Permission will be granted only after the content of the proposed Minimum Equipment List (MEL) has been vetted and found acceptable by the Airworthiness Office. Operators shall prepare their MELs in accordance with CAD 549 requirements.

7.2 The introduction to any MEL must contain a statement reminding the aircraft commander of his responsibility to ensure that the aircraft is in every way fit for the intended flight, and that he may apply a higher minimum standard if, in his opinion, it is necessary to do so in order to secure the safe operation of the aircraft.

7.3 MELs must be submitted to the Airworthiness Office at the time of an application for an AOC or a variation which covers the introduction of a new aircraft type, as should instructions and guidance to commanders on the operation of aircraft with deferred defects. The content of operators' MELs may not be less restrictive than that of the associated Master Minimum Equipment List (MMEL). Should an MMEL become more restrictive due to amendment action, operators must amend their MELs similarly.

7.4 When the carriage of unserviceable equipment results in a deviation from the normal drills, satisfactory alternative drills must be specified in the manual. For example, when thrust reversers are listed as minimum equipment, the operator must publish alternative drills.

8 FUEL PLANNING AND MANAGEMENT - AEROPLANES

8.1 Basic Principles

8.1.1 The total amounts of fuel and oil carried on board an aeroplane must be sufficient for the intended flight and must include a safe margin for contingencies. The manner in which the amounts should be calculated and the records that should be made before, during and after flight must all be specified. Fuel and oil records should be maintained to enable CAD to ascertain that, for each flight, the requirements for fuel and in-flight fuel management have been complied with; and that trends for oil consumption are such that an aeroplane has sufficient oil to complete each flight.

8.1.2 General considerations for calculating and recording fuel and oil requirements and usage are listed below. Instructions, similar to those given for fuel planning, should be specified for calculating the amount of oil needed to lubricate the engine(s) and associated systems, and for recording before, during and after flight, as appropriate, the quantities on board.

8.1.3 Operators must ensure that their fuel planning policy allows for the carriage of additional fuel, wherever it is known or suspected that there may be excessive landing

delays due to traffic or Air Traffic Control (ATC) problems at destination or diversion airfields. Furthermore, operating flight crews should be reminded that vigilance and early decision-making is necessary in exercising fuel management in order to ensure that the contingency, alternate and holding fuel allowances are not eroded to such an extent that operational safety is compromised.

8.1.4 The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, if applicable, adjustment of the planned operation.

Note: Guidance on procedures for in-flight fuel management including re-analysis, adjustment and/or re-planning considerations when a flight begins to consume contingency fuel before take-off is contained in the Flight Planning and Fuel Management Manual (Doc 9976).

8.1.5 There should be instructions and guidance on the effect on fuel consumption of engine or system failure. This could be a significant factor on long ocean or desert crossings, or where no suitable En-Route Alternates (ERAs) are available.

8.2 Basic Planning Tables

Fuel planning tables should be provided for all aeroplanes, except light single engine types. The tables must take account of aeroplane weight, outside air temperature and altitude and, where possible, head or tail wind components. Where tables are not provided, clear statements of the hourly rates of consumption must be made. All circumstances of flight that can reasonably be foreseen should be specified, including climb, cruise, descent, holding and abnormal configurations.

8.3 Planning Considerations

8.3.1 The following items should be included in the fuel planning process. The items may be combined but constituent parts of combinations should be fully described (see also paragraph 8.8 below):

(a) *Sector fuel:* which comprises fuel required for:
- (i) take-off and climb;
- (ii) cruise;
- (iii) descent; and
- (iv) approach to land;

(b) *Additional fuel:* e.g. fuel required for:
- (i) start-up, taxy-out and power checks;
- (ii) use of an auxiliary power unit on the ground and in the air;
- (iii) amounts used when operating de-icing systems and heaters;
- (iv) lengthy standard departure and arrival procedures;
- (v) quantities known to be unusable; and
- (vi) amounts required to compensate for potential delays en-route, such as weather avoidance.

8.3.2 Sufficient fuel must be carried to permit in the event of loss of pressurisation or the failure of a power unit at any point on the planned route:

(a) the flight to be continued to a suitable aerodrome for landing;

(b) to hold at 1500 feet over that aerodrome for 30 minutes; and

(c) to carry out an approach and landing.

8.3.3 Where analysis of fuel records shows deterioration in performance of a particular aircraft compared to that predicted in the manufacturer's fuel flow tables, a percentage correction should be established and applied to sector fuel calculations.

8.4 Monitoring Fuel on Board

8.4.1 There must be instructions for ascertaining before departure that the amount of fuel on board meets the commander's requirements. There must also be procedures for ensuring that, if in flight the amount of fuel calculated to remain overhead the aerodrome of intended landing is likely to become less than any minimum quantity specified, this fact becomes apparent at an early stage.

8.4.2 Before signing the technical log record page, the commander must satisfy himself that the correct type and quantity of fuel is on board and that it has been loaded in accordance with any instructions that may have been given. Units of weight or volume shown on the sector record page must be the same as those on fuel gauges visible to the pilot. Exceptionally, where there is a difference between the units on the fuel gauges and those on the sector record page, use of conversion tables may be approved. To have loadsheet fuel recorded in kilograms, uplifts in litres and aircraft gauges calibrated in pounds is to be avoided. Operators should provide all flight crews with simple fuel conversion charts/tables to reduce the likelihood of errors.

8.4.3 Instructions must be given on the frequency of fuel checks, the recording of information and the application of that information. In-flight checks should be carried out at least once on every sector and at intervals not exceeding 60 minutes on flights longer than 90 minutes. A calculation to determine the amount of fuel remaining and to predict the amount of fuel expected to remain overhead the aerodrome of intended landing should follow every check.

8.5 Fuel Alternates

8.5.1 An aerodrome suitable in all respects for use as an alternate, if a landing cannot be made at the intended destination, must be identified on both the pilot navigation log (plog) and on the ATC flight plan.

8.5.2 When the planned alternate aerodrome is in the same busy area as the destination, for instance Hong Kong and Macau, the track miles on which the fuel requirement for flying to the alternate is calculated should be realistically assessed taking account of the extended routeing which can reasonably be expected during busy periods.

8.6 Minimum Fuel Status

8.6.1 Under ICAO terminology, the declaration of MINIMUM FUEL informs ATC that all planned aerodrome options have been reduced to a specific aerodrome of intended landing and any change to the existing clearance may result in landing with less than the planned final reserve fuel. This is **not** an emergency situation but an indication that an emergency situation is possible should any additional delay occur.

8.6.2 Minimum Fuel. For operations under a Hong Kong AOC, the Final Reserve Fuel is the minimum amount of fuel required upon landing at any aerodrome with which is, for a turbine engine aeroplane, an amount of fuel required to fly for 30 minutes at holding

speed at 1,500 ft above aerodrome elevation in standard conditions; and for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes, under speed and altitude conditions acceptable to CAD, at the planned landing weight.

8.6.3 The pilot-in-command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than planned final reserve fuel.

8.6.4 The pilot-in-command shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY *FUEL,* when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

8.7 Extended Diversion Time Operations (EDTO)

Operations manuals should, if applicable, specify fuel planning requirements and procedures for flights as described in CAD 513.

8.8 Fuel Planning - Specific Requirements

8.8.1 At the planning stage the quantity of fuel required to be on board before the aeroplane departs should be calculated and recorded. Only those procedures that are specified in operations manuals may be used.

8.8.2 The amount of usable fuel to be carried shall, as a minimum, be based on:

(a) the following data:
  (i) current aeroplane-specific data derived from a fuel consumption monitoring system, if available; or
  (ii) if current aeroplane-specific data is not available, data provided by the aeroplane manufacturer; and

(b) the operating conditions for the planned flight including:
  (i) anticipated aeroplane mass;
  (ii) Notices to Airmen;
  (iii) current meteorological reports or a combination of current reports and forecasts;
  (iv) air traffic services procedures, restrictions and anticipated delays; and
  (v) the effects of deferred maintenance items and/or configuration deviations.

8.8.3 *Pre-flight Fuel Planning*

A flight shall not commence unless the usable fuel on board meets a pre-flight calculation including:

(a) *taxi fuel,* which shall be the amount of fuel expected to be consumed before take-off taking into account local conditions at the departure aerodrome and auxiliary power unit (APU) fuel consumption;

(b) *trip fuel,* which shall be the amount of fuel required to enable the aeroplane to fly from takeoff or the point of in-flight re-planning until landing at the

destination aerodrome taking into account the operating conditions of 8.8.2(b);

(c) *contingency fuel*, which shall be the amount of fuel required to compensate for unforeseen factors. It shall be 5 per cent of the planned trip fuel or of the fuel required from the point of in flight re-planning based on the consumption rate used to plan the trip fuel but in any case shall not be lower than the amount required to fly for five minutes at holding speed at 1 500 ft above the destination aerodrome in standard conditions, **plus** 5 per cent of the planned destination alternate fuel as required under paragraph 8.8.3(d);

Note: Unforeseen factors are those which could have an influence on the fuel consumption to the destination aerodrome, such as deviations of an individual aeroplane from the expected fuel consumption data, deviations from forecast meteorological conditions, extended delays and deviations from planned routings and/or cruising levels.

(d) *destination alternate fuel*, which shall be:

(i) where a destination alternate aerodrome is required, the amount of fuel required to enable the aeroplane to:

1) perform a missed approach at the destination aerodrome;
2) climb to the expected cruising altitude;
3) fly the expected routing;
4) descend to the point where the expected approach is initiated; and
5) conduct the approach and landing at the destination alternate aerodrome; or

(ii) where two destination alternate aerodromes are required, the amount of fuel, as calculated in 8.8.3(d)(i), required to enable the aeroplane to proceed to the destination alternate aerodrome which requires the greater amount of alternate fuel; or

(iii) where a flight is operated without a destination alternate aerodrome, the amount of fuel required to enable the aeroplane to fly for 15 minutes at holding speed at 1 500 ft above destination aerodrome elevation in standard conditions; or

(iv) where the aerodrome of intended landing is an isolated aerodrome:

1) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes plus 15 per cent of the flight time planned to be spent at cruising level, including final reserve fuel, or two hours, whichever is less, or

2) for a turbine engine aeroplane, the amount of fuel required to fly for two hours at normal cruise consumption above the destination aerodrome, including final reserve fuel; and

3) aerodromes designated 'isolated' shall be listed in the operations manual; and

4) the latest point of diversion between the isolated aerodrome

destination and a suitable en-route diversion shall be calculated.

(e) *final reserve fuel,* which shall be the amount of fuel calculated using the estimated mass on arrival at the destination alternate aerodrome or the destination aerodrome, when no destination alternate aerodrome is required:

(i) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes, under speed and altitude conditions acceptable to CAD;

(ii) for a turbine engine aeroplane, the amount of fuel required to fly for 30 minutes at holding speed at 450 m (1 500 ft) above aerodrome elevation in standard conditions;

Note: Operators may determine one final reserve fuel value for each aeroplane type and variant in their fleet rounded up to an easily recalled figure.

(f) *additional fuel,* which shall be the supplementary amount of fuel required if the minimum fuel calculated in accordance with 8.8.3(b) to (e) is not sufficient to**:**

(i) allow the aeroplane to descend as necessary and proceed to an alternate aerodrome in the event of engine failure or loss of pressurization, whichever requires the greater amount of fuel based on the assumption that such a failure occurs at the most critical point along the route;

1) fly for 15 minutes at holding speed at 1,500 ft above aerodrome elevation in standard conditions; and
2) make an approach and landing;

(ii) allow an aeroplane engaged in EDTO to comply with the EDTO critical fuel scenario as established in CAD 513;

(iii) meet additional requirements not covered above;

(g) *discretionary fuel,* which shall be the extra amount of fuel to be carried at the discretion of the pilot-in-command.

8.8.4 Use of En-Route Alternate (ERA). The normally calculated contingency fuel can be reduced by use of a nominated ERA as follows:

(a) The ERA must be an adequate aerodrome which is open. The forecast weather must be such that a landing can be assured.

(b) The normal calculated contingency fuel should be as per paragraph 8.8.3(c).

8.8.5 Notwithstanding the provisions in 8.8.3(a) to (d) and (f), CAD may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve variations to the pre-flight fuel calculation of taxi fuel, trip fuel, contingency fuel, destination alternate fuel, and additional fuel. The specific safety risk assessment shall include at least the:

(a) flight fuel calculations;

(b) capabilities of the operator to include:

i) a data-driven method that includes a fuel consumption monitoring programme; and/or
ii) the advanced use of alternate aerodromes; and

(c) specific mitigation measures.

8.8.6 Reclearance in Flight. When a flight cannot depart with the total fuel calculated in accordance with the normal planning formula, dispatch may be achieved by the operator nominating a suitable aerodrome en-route as the destination with the intention of obtaining a reclearance in flight to the original destination, if the commander is satisfied that:

(a) the nominated destination aerodrome is both suitable and available with the weather forecast satisfactory for landing; and

(b) the fuel on board meets the requirements in 8.8.3(a) to (f) and, from the point of in-flight replanning, meets the requirements in 8.8.3(b) to (f), as appropriate.

NOTES: (1) Pilot navigation logs must show the name of the aerodrome en-route that is used for this planning purpose; the weather conditions relating to both destination and nominated en-route aerodromes must be recorded.

(2) Some Authorities are not willing to have aerodromes in their jurisdiction nominated as a destination, if that is not the intention, as may be the case in this procedure.

8.9 In-flight Fuel Management

8.9.1 *General Requirements.* An operator shall establish policies and procedures for CAD's approval to ensure that in-flight fuel checks and fuel management are performed. The pilot-in-command shall continually ensure that the amount of usable fuel remaining on board is sufficient to satisfy the requirements listed below such that it is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remained upon landing.

Note: The protection of final reserve fuel is intended to ensure a safe landing at any aerodrome when unforeseen occurrences may not permit safe completion of an operation as originally planned.

8.9.2 The pilot-in-command shall request delay information from ATC when unanticipated circumstances may result in landing at the destination aerodrome with less than the final reserve fuel plus any fuel required to proceed to an alternate aerodrome or the fuel required to operate to an isolated aerodrome. Clear instructions must be given by the operator on the other action the commander must take i.e. range of options requiring consideration, if at any stage it appears that the fuel on board is less than required.

8.9.3 *Company Minimum Reserve (CMR).* This is the minimum, normal fuel state on arrival at the destination missed approach point (MAP). It is the sum of*:*

(a) The fuel required to proceed to the chosen alternate airport; and

(b) Contingency fuel applicable to (a); and

(c) Final reserve fuel as calculated under paragraph 8.8.3(e).

8.9.4 *Use of En-Route Alternate (ERA).* For flights that use the ERA formula, on passing overhead or abeam the ERA, the fuel expected to remain at the MAP of the intended destination should not be less than CMR.

8.9.5 *Use of Isolated Aerodromes.* For flights that use the isolated aerodrome conditions, on passing the latest point of diversion the fuel expected to remain overhead the intended destination should not be less than the amount of fuel as required under paragraph 8.8.3(d)(iv). Crews must, before passing this point, obtain the weather conditions existing at the destination and a current forecast for the time of expected arrival.

8.9.6 *Reclearance in Flight.* For flights that use the reclearance in flight procedure, when passing over or abeam the nominated destination aerodrome (reclearance point), the fuel expected to remain at the MAP of the original destination should not be less than CMR.

8.9.7 *Fuel Balancing.* On multi-crew aircraft the instructions for fuel balancing must cover the following points:

(a) if an abnormal fuel feed procedure is used to balance fuel, the aircraft commander must be informed and at least two flight crew members must monitor the operation; and

(b) when balancing fuel, the procedure should be accomplished in accordance with the Aircraft Flight Manual (AFM).

Predicted Reduced Fuel State - Destination

8.9.8 A fuel progress chart must be included as part of the CFP for each flight made for the purposes of public transport, in order to predict a flight's arrival fuel at its destination. Periodic entries made at regular intervals by the crew, enable a perception to be made of how well the flight is doing in relation to the planned fuel progression and enables the crew, at some point along the route, to determine with fair accuracy, whether the flight will arrive at the destination with the required amount of fuel – the CMR – on board.

8.9.9 *General Requirement*s. If it becomes apparent that the fuel remaining is close to the CMR, the commander must have clear instructions on the actions he must take.

Whilst en-route, options generally available are:

(a) adjust aircraft speed;

(b) obtain a more direct routing;

(c) fly at a different flight level;

(d) land and refuel; or

(e) select an alternate aerodrome which is closer to the destination airfield than that specified in the ATC flight plan and so reduce the CMR.

8.9.10 Where a flight has been despatched with less than the required fuel, for example when utilising an ERA, early fuel checks will naturally show that the predicted fuel remaining will be less than CMR. As the flight progresses, updated assessments of the fuel remaining at the destination will continue to be made. The decision, in the light of the fuel required, regarding continuing to the destination or diverting to an en route airport, should be made at a point where diversion is still feasible.

8.9.11 If en route it becomes obvious that a flight will not arrive at the destination with the required CMR, the flight may continue to the planned destination, provided that the fuel remaining on landing will be not less than an amount equal to that which would enable the aircraft to hold for 30 minutes at 1500 ft at the anticipated landing weight – i.e. Minimum Fuel under paragraph 8.6.2 – and ALL of the following conditions are satisfied:

(a) There must be at least two geographically separate runways available for use which meet the performance criteria for the aircraft; and

(b) There must be no ATC delays forecast for the flight's ETA at the destination; and

(c) The actual weather and that forecast for the flight's ETA at the destination must be at, or better than, the alternate planning minima for the non-precision approach aid with the higher minima serving the two runways being considered in (a) above and, in addition, the surface wind is within the normal crosswind limits for the aircraft type.

Where these conditions are not satisfied, the flight must divert to an en route airport for refuelling.

8.9.12 *After Commencing Descent*

If, after commencing descent, an unforeseen situation develops which may cause the expected amount of fuel at the destination MAP to drop below CMR fuel, the flight may continue to the destination airport provided that the fuel remaining on landing will be at least equal to Minimum Fuel under paragraph 8.6.2. However, the commander must, in electing to continue rather than proceed to the alternate, ensure that all relevant factors are taken into consideration with particular reference to the reason for the delay, weather deterioration and runway availability at the destination and alternate. If at any time it becomes apparent that a flight cannot be completed with Minimum Fuel available upon landing, an emergency must be declared.

9 FUEL PLANNING AND MANAGEMENT - HELICOPTERS

Cancelled - refers to CAD 360 Helicopter Supplement

10 CHECKLISTS

10.1 The drills and checks to be followed including those for emergency and abnormal conditions should be listed in full in the operations manual in the form of expanded checklists. In addition, abbreviated working checklists should be provided on the flight deck for the use of the flight crew.

10.2 The checklists and drill cards provided by an operator for use by his crews must correctly reflect the requirements, instructions, drills and procedures specified in the aircraft's Flight Manual.

10.3 Instructions on how to use the checklists and drill cards should be provided in the manual. For convenience in handling, the checklist for normal operations should be separate from the abnormal and emergency checklist. The colour of the emergency and abnormal checklists should be sufficiently distinctive to avoid them being mistaken for other volumes. They must be stowed on the flight deck separately from other documents in such a manner as to be immediately ready for use.

10.4 Separate checklists or drill cards must be provided for each flight crew member. In 'single pilot' aircraft, checklists can be supplemented by placarding vital actions for final approach and landing.

10.5 All checklists or drill cards must be of a quality sufficient to withstand heavy wear and remain legible. The design and utilisation of checklists shall observe Human Factors principles.

10.6 Details of cabin crews' ditching, crash landing and emergency evacuation drills should be readily available. This may be achieved either by issuing to each cabin crew a copy of their emergency drills - which they should be required to carry with them - or stowing the drill cards at appropriate positions in the cabin.

10.7 On multi-crew aircraft, instructions must be given that checklists are always to be used. On single pilot aircraft the operator may allow in-flight drills to be carried out from memory but must ensure that a checklist is readily available to the pilot. Memorised drills must be carried out strictly in accordance with the checklist and emergency drills must be verified as soon as possible by reference to the checklist.

10.8 On multi-crew aircraft, drills should be so constructed that the handling pilot, as far as possible, has only to control the aircraft's flight path and cross check the correct selection of a lever or a switch before it is used. The use of responses such as "SET" or "AS REQUIRED" should be avoided and are better replaced by a specific indication of what is required.

10.9 Where emergency and abnormal drills do not include all the necessary items and actions to re-land, a clear instruction referring the crew back to the normal checklist must be made.

10.10 An abbreviated version of the normal checklist may be produced for use by training captains whilst on circuit training. This should retain the sequences of the normal checklist.

10.11 Each page of a checklist must be dated and the amendment state of the checklist ascertainable by means of a simple amendment record. This record should be incorporated at a suitable place in the checklist.

10.12 The following items, where applicable, must be included at the appropriate point in the normal checklist (the actual form of words may be varied):

(a) crew seats, seat belts and harnesses fastened/locked for take-off and landing;

(b) flying controls unlocked and checked for freedom of movement;

(c) cabin prepared for take-off and landing;

(d) reference speeds noted and/or bugs set and cross checked;

(e) instruments checked before take-off and prior to commencing approach;

(f) altimeters set and cross checked and required setting (QFE, QNH, QNE) at each stage of flight;

(g) pre-take-off/landing signal to cabin crew - PA or chime;

(h) radio aids set and identified (by more than one crew member on multi-crew operations)

(i) RTOW and performance data checked valid for runway in use immediately before take-off;

(j) performance data for approach and landing (normally before commencing descent);

(k) MSA check prior to descent.

10.13 There should be checklist prompts requiring the aircraft commander to brief the flight crew on the following topics:

(a) Prior to take-off:
- (i) the actions to be taken if an emergency occurs during or immediately after take-off;
- (ii) special techniques for take-off in crosswinds and on wet or otherwise contaminated runways;
- (iii) noise abatement procedures;
- (iv) selection of radio aids; and
- (v) selection and checking of reduced thrust for take-off, when permitted.

(b) Prior to landing:
- (i) selection of radio aids;
- (ii) missed approach procedures;
- (iii) any special techniques or system configurations for landing; and
- (iv) selected alternate for diversion.

Note: It is not necessary to include these items in detail if suitable instructions are provided elsewhere. The word 'briefing' is sufficient at the appropriate points in the checklists.

10.14 Abnormal operation checklists should include such drills as:

(a) hydraulic failures;

(b) fuel system failures;

(c) air-conditioning/pressurisation failures; and

(d) electrical system failures.

10.15 Examples of emergency drills to be covered are as follows: (Note - memory actions are annotated M)

- engine failure on take off
  * rejected take off at or before V_1 drill (**M**)
  * after V_1 (instruction must be given that drills are **not** to be performed before reaching a minimum safe altitude)
  * engine fire/failure after V_1 drills, could include after take off check
- engine shut down
- engine fires (**M**)
- propeller malfunctions (**M**)
- fuel filter de-icing
- relighting of turbine engines and relight envelope graph
  * instant relight (**M**)
  * normal relight
- restarting reciprocating engines and restart envelope graph
- bus bar and other serious electrical failures (**M**)
- pressurization failures
- emergency descent (**M**)
  * to include use of oxygen mask and microphone (**M**)
- malfunction of power control systems
- cabin and hold fires
- smoke removal
  * to include maximum IAS for flight with direct vision window open if permissible
- landing gear fires
- landing
  * with gear asymmetry

  * with gear up
  * ditching
- evacuation drills
- pilot cockpit pre-evacuation drills (**M**) following
  * crash landing
  * ditching
  * rejected take off to be followed by evacuation
  * normal landing, or
  * at any other time whilst on the ground
- imminent overrun of manoeuvring area drill (**M**)
- bomb-on-board warnings.

11 USE AND CHECKING OF ALTIMETERS

11.1 Operators must have a clear policy on altimeter setting procedures, particularly their use of QFE and QNH; this policy must be clearly described in operations manuals to cover all phases of flight.

11.2 This policy must incorporate:

(a) Pre-flight serviceability tests;

(b) Flight crew altimeter setting procedures, including:

(i) the setting to be used for each phase of flight;

(ii) the correct challenge and response for altimeter cross-check(s), particularly during climb, descent and approach and when nearing an assigned altitude/level;

(iii) alternative settings and procedures, if appropriate, for use when QFE is either not available or cannot be used e.g. at high altitude aerodromes;

(iv) the manner of checking and of use of any radio altimeter(s) ;

(v) special precautions to be taken if an altimeter is suspect or becomes unserviceable in flight;

(vi) confirmation that, unless special conditions exist, the standard setting procedure will be used irrespective of which seat the handling pilot occupies on take-off;

(vii) the annotation of checklists with the actual setting to be used e.g. QNH/QFE; phrases such as 'altimeters set' should not be used;

(viii) the correct report of altitude/level changes to ATC; such reports should **not** be made before reaching or leaving a particular altitude/level;

(ix) provision for one altimeter to be set to the appropriate QNH, when flying at or near to the MSA; this has particular relevance to single-pilot unpressurised aircraft.

(x) a check of aerodrome elevation during the approach phase; this is to be cross-checked to establish the difference between QFE and QNH, when QFE is used for landing;

(xi) the procedure for indicating decision heights for landing, e.g. a figure in the navigation log, altimeter 'bugs' and/or landing data cards;

(xii) the requirement for crews to inform ATC prior to its commencement if it is intended to use QNH settings throughout a radar approach procedure;

(xiii) the calls to be made by monitoring pilots or auto calls during instrument approaches i.e. at the outer marker or equivalent, 500 feet above runway elevation, 100 feet above DA/DH or MDA and minima. The calls and responses required for approaches in Category 2 or 3 weather minima conditions will need to be specified in greater detail; and

(xiv) the procedures to be used when flying in airspace where metric units are in use. If no metric altimeter is fitted, detailed instructions must be provided on the method of cross-checking conversions from metres to feet and vice-versa.

12 EMERGENCY EVACUATION PROCEDURES

Procedures for the evacuation of an aircraft and care of passengers following a forced landing, ditching or other emergency are to be specified. Much of the information will be descriptive but the basic drills to be followed by the various members of the aircraft crew must be summarised and tabulated. Particular attention should be paid to the following points:

(a) the correct setting for pressurisation system controls prior to ditching;

(b) the ground positioning of the aircraft relative to the wind, wherever possible, to allow for the safest possible evacuation in the event of an aircraft fire;

(c) the use of emergency escape chutes and evacuation slides/rafts;

(d) the fitting of life-jackets to small children and the use of flotation cots;

(e) the briefing of passengers and warning of impact;

(f) flight deck drills should be memory drills and all flight deck crew members should carry them out in a coordinated manner, when ordered to do so by the captain;

(g) cabin drills should nominate individual responsibility for initiating evacuation and detail cabin crews' duties inside and outside of the aircraft;

(h) the location and use of each item of emergency and survival equipment. Any variation between such equipment carried in individual aircraft of the same type must be shown;

(i) the carriage of disabled passengers, how they are dealt with, should an emergency evacuation of the aircraft be necessary, and any need to carry additional cabin crew; the aircraft commander must be informed when severely disabled persons are on board; and

(j) the procedure for warning the cabin crews of any emergency which might require the rapid evacuation of passengers from the aircraft.

Note 1: Operators may be required to arrange a demonstration emergency evacuation, if concern arises as to the effectiveness of procedures that are proposed.

Note 2: If electrical power is maintained or re-applied after an accident or incident, the Flight Data Recorder (FDR) or Cockpit Voice Recorder (CVR) may continue to run and hence obliterate accident or incident data. Crews should wherever possible ensure electrical isolation of the FDR/CVR, particularly if re-applying power.

13 RADIO WATCH

Radio watch instructions must contain the requirement for a continuous watch on operational frequencies not equipped with SELCAL and shall include the requirement for flight crews to monitor distress frequency 121.5 MHz at all times when operationally possible.

14 ROUTE GUIDE

14.1 The route guide provided in accordance with the provisions in Schedule 11 of the AN(HK)O should be a volume or series of volumes separate from the rest of the operations manual. Information in the AIP, AIC, NOTAM and AIRAC shall be taken into account in the development of route guide. Aerad, Jeppesen or similar publications will normally meet the requirement, provided that flight crews are given adequate advice on the route to be followed. An operator providing his own guide should ensure that it meets the needs of crews in every respect. If flights are to be made only on airways or Advisory Routes (ADRs), it will be sufficient to include instructions to that effect; otherwise routes regularly flown should be specified in detail, normally on prepared navigation flight plans. For other flights, routes should be specified in a commander's flight brief, a copy being retained at base.

14.2 Particular care should be taken to ensure that adequate information is provided on search and rescue facilities, obstructions in the approach pattern, radio failure procedures, prohibited and danger areas and standard Terminal Manoeuvring Area (TMA) routeings. Only recognised instrument approach or let-down procedures in general use should normally be included in the flight guide. Exceptionally, a special 'break cloud' procedure proposed by the operator may be considered by CAD, provided it is acceptable to the appropriate Airport Authority. Proposals to use such special procedures, accompanied by the associated aerodrome operating minima, should be submitted to the Inspector.

14.2.1 Neither Jeppesen nor Aerad approach plates display the vertical limits of controlled airspace, although this information is available on some area and en-route charts.

14.3 Normally, the cancellation of Instrument Flight Rules (IFR) flight plans at night or in congested terminal areas should be prohibited and instructions to this effect included in the operations manual. If an operator does not wish to impose a total prohibition, detailed instructions should be included in the operations manual, setting out the minimum conditions that must be satisfied before cancellation of an IFR flight plan.

Note: Aircraft are not permitted to fly under VFR at night in HK airspace. A visual approach does not require the cancellation of an IFR flight plan (see ICAO definition of visual approach).

14.4 In some circumstances an abbreviated approach procedure may be adopted; the conditions under which this procedure may be followed should be detailed in the operations manual.

14.5 In order to facilitate effective monitoring of an instrument approach by members of the flight crew, operators of multi-crew aircraft should provide for use on the flight deck at least two copies of the Instrument Approach charts to be used.

14.6 Further guidance and requirements on route and aerodrome knowledge in relation to the prevention of aeroplane upsets can be found in Paragraph 4, Appendix G of Chapter 5.

15 METEOROLOGICAL REPORTS FROM AIRCRAFT

15.1 Reference to meteorological reports from aircraft in flight should be based on the information and guidance in the Hong Kong Aeronautical Information Publication (AIP) and/or on any special requirements of foreign authorities.

15.2 Reference to reports on volcanic activities from aircraft in flight and report made after landing should be based on the information and guidance in the Hong Kong AIP and/or on any special requirements of foreign authorities.

15.3 The pilot-in-command shall report the runway braking action special air-report (AIREP) when the runway braking action encountered is not as good as reported.

16 MINIMUM SAFE ALTITUDES

16.1 Minimum safe altitudes are to be prescribed by the operator for each sector from take-off, on each route to be flown, including routes to alternate aerodromes. For this purpose 'sector' means the intended track from a reporting or turning point to the next, until the aircraft starts the instrument approach procedure or joins the traffic pattern at the aerodrome to be used for landing. Minimum safe altitudes must be specified by the operator in the appropriate volume of the manual, in a prepared navigation flight plan or in the commander's flight brief.

16.2 To provide the commander with guidance for the calculation of minimum safe altitudes, when he is obliged to depart from the planned or normal route, operators must include a formula in the manual, expressed as simply as possible, from which the minimum safe altitude can be calculated. The formula must secure at least the normal terrain clearance standards laid down by the operator,

16.3 When specifying minimum safe altitudes, operators must take account of CAD would approve the method of calculation of minimum safe altitudes only after careful consideration of the probable effects of the following factors on the safety of the operation in question:

(a) the accuracy and reliability with which the position of the aeroplane can be determined;
(b) the inaccuracies in the indications of the altimeters used;
(c) the characteristics of the terrain (e.g. sudden changes in the elevation);
(d) the probability of encountering unfavourable meteorological conditions (e.g. severe turbulence and descending air currents);
(e) possible inaccuracies in aeronautical charts;
(f) airspace restrictions, and
(g) any applicable local regulations.

16.4 The criteria upon which minimum safe altitudes are based, related to the track guidance facilities available to the commander. The minimum acceptable standards are as below; however such standards are modified when flying over high terrain or when the ambient air temperature is very low. These variations are covered in paragraphs 16.5 and 16.7.

16.4.1 *For general application.* Where the terrain or obstacle is 5000 feet Above Mean Sea Level (AMSL) or lower, the minimum safe altitude is 1000 feet above the highest terrain or obstacle within 20 nm of the route centre line. Where that terrain or obstacle is higher than 5000 feet AMSL, the minimum safe altitude is 2000 feet or more above the highest terrain or obstacle within 20 nm of the route centre line.

16.4.2 *For flight in controlled airspace.* Where the track is well defined by two separate aids, the minimum safe altitude is 1000 feet above the highest terrain or obstacle within 10 nm of the route centre line. Where the highest terrain or obstacle, within 10 nm of the route centre line, is higher than 5000 ft AMSL, the minimum safe altitude is 2000 feet or more above that terrain or obstacle. When the sector length between navigational aids which define turning points is such that the aircraft could be more than 5 nm from the centre line, due to inherent errors in the system used to define an airway, the limit of protection must be increased by the extent to which the divergence exceeds 5 nm.

16.4.3 *For radar controlled flight within 25 nm of the aerodrome of departure or intended landing.* The minimum safe altitude is 1000 feet above the highest terrain or obstacle within 5 nm of the intended track. Commanders must be instructed to monitor all radar instructions by reference to other aids and be reminded that, when under radar control, it is their individual responsibility to ensure adequate terrain clearance. Minimum safe altitudes within 25 nm of aerodromes are referred to as minimum sector altitudes.

16.4.4 *Use of flight guides.* An operator may use minimum safe altitudes and minimum sector altitudes given in a recognised Flight Guide, provided that the basis of the publisher's calculations will give at least an equal standard to that required by this section. If necessary, corrections can be made and promulgated in the manual so that the prescribed vertical separation is maintained.

16.5 **Corrections to Planned Minimum Safe Altitudes for Flights Over High Ground**

When the selected cruising altitude or flight level or one-engine-inoperative stabilising altitude is at or close to the calculated minimum safe altitude and the flight is within 20 nm of terrain having a maximum elevation exceeding 2000 feet, the previously calculated MSA must be increased as follows:

HEIGHT INCREASE FOR FLIGHT OVER HIGH GROUND

	Windspeed in Knots			
Elevation of terrain	*0-30*	*31-50*	*51-70*	*Over 70*
2000-8000 ft	500 ft	1000 ft	1500 ft	2000 ft
Above 8000 ft	1000 ft	1500 ft	2000 ft	2500 ft

Note: Relevant instructions must be included in the Operations Manual.

16.6 Manuals must include a reference to the effect of mountain waves on the maintenance of vertical separation and instruct commanders to take suitable precautions when such conditions are reported or forecast.

16.7 Adequate allowances to calculated minimum safe altitudes must be made when the ambient temperature on the surface is much lower than that predicted by the standard atmosphere. When the ambient temperature is lower than International Standard Atmosphere (ISA) -15°C, the following additions to minimum safe altitude must be made:

ISA -15°C to -24°C	Not less than 10%
ISA -25°C to -34°C	Not less than 15%
ISA -35°C to -45°C	Not less than 20%
< ISA -45°C	Not less than 25%

16.8 For any route the maximum altitude obtainable with all power units operating, or the appropriate stabilising altitude with one-engine-inoperative, must be greater than the calculated minimum safe altitude for that route.

17 AERODROME OPERATING MINIMA (AOM) - TAKE OFF AND LANDING

17.1 Minima for aerodrome in regular use and associated alternates must be listed in the operations manual, for take-off, landing and visual manoeuvring. For aerodrome visited infrequently the minima may be listed in the commander's brief; a copy must be retained for 6 months. The method of determination of such minima should be approved by CAD and take full account of:

(a) the type, performance and handling characteristics of the aeroplane and any conditions or limitations stated in the flight manual;
(b) the composition of the flight crew, their competence and experience;
(c) the dimensions and characteristics of the runways which may be selected for use;
(d) the adequacy and performance of the available visual and non-visual ground aids;
(e) the equipment available on the aeroplane for the purpose of navigation, acquisition of visual references and/or control of the flight path during the approach, landing and the missed approach;
(f) the obstacles in the approach and missed approach areas and the obstacle clearance altitude/height for the instrument approach procedures;
(g) the means used to determine and report meteorological conditions;
(h) the obstacles in the climb-out areas and necessary clearance margins;
(i) the conditions prescribed in the operations specifications; and
(j) any minima that may be promulgated by the State of the Aerodrome.

17.1.1 Such minima shall not be lower than any that may be established for such aerodromes by the State of the Aerodrome, except when specifically approved by that State.

17.1.2 CAD authorization is required for operational credit(s) for operations with advanced aircraft. Where the operational credit relates to low visibility operations, specific approvals issued by CAD are required. Such authorizations shall not affect the classification of the instrument approach procedure.

Note 1: Operational credit includes:
(a) for the purposes of an approach ban (Ch.4 para. 17.14.1) or dispatch consideration, a minimum below the aerodrome operating minima;
(b) reducing or satisfying the visibility requirements; or
(c) requiring fewer ground facilities as compensated for by airborne capabilities.

Note 2: Guidance on operational credit and how to express the operational credit in the Operations Specifications is contained in ICAO Doc 9365 "Manual of All-weather Operations".

17.1.3 An operator applying for specific approval for operational credit shall demonstrate that:

(a) the aeroplane meets the appropriate airworthiness certification requirements;
(b) the information necessary to support effective crew tasks for the operation is appropriately available to both pilots where the number of flight crew members specified in the operations manual is more than one;

(c) the operator has carried out a safety risk assessment of the operations supported by the equipment;
(d) the operator has established and documented normal and abnormal procedures and MEL;
(e) the operator has established a training programme for the flight crew members and relevant personnel involved in the flight preparation;
(f) the operator has established a system for data collection, evaluation and trend monitoring for low visibility operations for which there is an operational credit; and
(g) the operator has instituted appropriate procedures in respect of continuing airworthiness (maintenance and repair) practices and programmes.

Note 1: Guidance on safety risk assessments is contained in the ICAO Doc 9859 "Safety Management Manual".

Note 2: Guidance on operational approvals is contained in ICAO Doc 9365 "Manual of All-weather Operations".

17.1.4 Operations with operational credit with minima above those related to low visibility operations shall be authorized by CAD and be dependent on the intended operation and the complexity of the equipment.

Note: Guidance on operational credit for operations with minima above those related to low visibility operations is contained in ICAO Doc 9365 "Manual of All-weather Operations".

17.1.5 Operators' instructions on aerodrome operating minima are particularly important. They should be stated clearly for the benefit of flight crew members. The instructions and tables have two purposes:

(a) to enable the commander to appreciate the operator's intentions and requirements; and
(b) to decide whether to commence or continue an approach.

17.1.6 A flight shall not take off, or continue beyond the point of in-flight replanning unless at the aerodrome of intended landing or at each alternate aerodrome to be selected in compliance with paragraph 17.11.2, current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions will be, at the estimated time of use, at or above the company's established aerodrome operating minima for that operation.

17.2 Minima for take-off and landing must be specified for each type of aircraft and for each runway and associated approach aid at each aerodrome. Take-off minima will vary with the performance group of the aircraft. Operators shall make reference to ICAO Doc 9365 "Manual of All-weather Operations" for minimum values acceptable to CAD, landing minima, and the method of calculation. Landing minima can be calculated using different methods from those detailed ICAO Doc 9365, but such minima must be no lower than those derived from the ICAO Doc. Operators of helicopters should consult their assigned Inspector.

17.3 It is the responsibility of operators to establish and specify appropriate minima. CAD and its Inspectors cannot assume any responsibility for the minima specified and every instruction issued. The operator must designate a suitably qualified person to keep the instructions under review and amend, as necessary.

17.4 For normal operations (non-LVO) and for Take Off, operators are permitted to use the minimum RVR, as amended by NOTAM, or as published on the appropriate approach or aerodrome charts forming part of their operations manual, whichever is the higher. Subject to CAD's acceptance, operator's obligation to publish AOM may be fulfilled by use of aerodrome and approach charts that have been published using Pans Ops, Terps or other State criteria.

17.5 Guidance on the calculation of landing minima for Category II and III operations is given in CAD 359 – Low Visibility Operations.

17.6 Minima and associated instructions must be presented so that the information is readily available to and easily interpreted by the flight crew.

17.7 Only 'notified' or approved instrument approach procedures may be included in the tables. Instrument approach and landing operations with aerodrome operating minima below 800 m visibility should not be authorised unless RVR information is provided. Runways or landing strips and approach aids which are not authorised for either take-off or landing must be specified either in the AOM tables or by a general instruction.

17.8 For the guidance of commanders, who may be obliged to take off from or land at aerodromes for which values have not been specified, operators must give data and instructions which allow for the calculation of minima. The data and instructions should be expressed as simply as possible and secure, as a minimum the normal operating standards observed by the operator. In these circumstances it may not be practicable for the commander to give the same detailed consideration to all the relevant factors as the operator. Therefore, the minima calculated in this way will usually be higher than those which would have been precalculated. When an aircraft commander calculates AOM in accordance with these criteria, the calculations must be retained with other flight documentation.

17.9 Operators must state that a commander is authorised to exercise discretion and apply minima higher than those prescribed by the operator, when it is necessary to secure the safety of the aircraft.

17.10 Minima for commanders with limited experience on type shall be established.

17.11 **Instrument approach operations**

17.11.1 Instrument approach operations shall be classified based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows:

(a) Type A: a minimum descent height or decision height at or above 75 m (250 ft); and

(b) Type B: a decision height below 75 m (250 ft). Type B instrument approach operations are categorized as:

(i) Category I (CAT I): a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;

(ii) For information on Category II and III operations, please refer to CAD 359 – Low Visibility Operations.

17.11.2 The operating minima for 2D instrument approach operations using instrument approach procedures shall be determined by establishing a minimum descent altitude (MDA) or minimum descent height (MDH), minimum visibility and, if necessary, cloud conditions.

17.11.3 The operating minima for 3D instrument approach operations using instrument approach procedures shall be determined by establishing a decision altitude (DA) or decision height (DH) and the minimum visibility or RVR.

17.11.4 An operator shall establish operational procedures designed to ensure that an aeroplane being used to conduct 3D instrument approach operations crosses the threshold by a safe margin, with the aeroplane in the landing configuration and attitude.

17.12 **Selection of Alternate Aerodromes**

17.12.1 Alternate aerodromes designated by the operator must be specified either in the manual or in the commander's flight brief. Instructions must be given on the factors to be taken into account by commanders in the selection of alternates for particular flights.

17.12.1.1 *Take-off alternate aerodrome.* A take-off alternate aerodrome shall be selected and specified in the CFP if either the meteorological conditions at the aerodrome of departure are below the company's aerodrome landing minima for that operation or if it would not be possible to return to the aerodrome of departure for other reasons. For an aerodrome to be selected as a take-off alternate the available information shall indicate that, at the estimated time of use, the conditions will be at or above the company's aerodrome operating minima for that operation. It shall be located within the following flight time from the aerodrome of departure:

(a) for aeroplanes with two engines, one hour of flight time at a one-engine-inoperative cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

(b) for aeroplanes with three or more engines, two hours of flight time at an all-engine operating cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

(c) for aeroplanes engaged in EDTO where an alternate aerodrome meeting the distance criteria of (a) or (b) is not available, the first available alternate aerodrome located within the distance of the operator's specifically approved maximum diversion time considering the actual take-off mass.

17.12.1.2 *En-route alternate (ERA) aerodromes.* Shall be selected and specified in the operational and filed flight plans, and, if applicable, in the preliminary flight plan, for EDTO by aeroplanes with two turbine engines.

17.12.1.3 *Destination alternate aerodromes.*

(a) For a flight to be conducted in accordance with the instrument flight rules, at least one destination alternate aerodrome shall be selected and specified in the operational and filed flight plans, and, if applicable, in the preliminary flight plan, unless:

(i) the duration of the flight from the departure aerodrome, or from the point of in-flight replanning to the destination aerodrome is such that, taking into account all meteorological conditions and operational information relevant to the flight, at the estimated time of use, a reasonable certainty exists that:

(1) the approach and landing may be made under visual meteorological conditions; and
(2) separate runways are usable at the estimated time of use of the destination aerodrome with at least one runway having an operational instrument approach procedure; or

(ii) the aerodrome is isolated. Operations into isolated aerodromes do not require the selection of a destination alternate aerodrome(s) and shall be planned in accordance with paragraph 8.8.3(d)(iv);

(1) for each flight into an isolated aerodrome a point of no return shall be determined; and
(2) a flight to be conducted to an isolated aerodrome shall not be continued past the point of no return unless a current assessment of meteorological conditions, traffic, and other operational conditions indicate that a safe landing can be made at the estimated time of use.

(b) Two destination alternate aerodromes shall be selected and specified in the operational and filed flight plans, and, if applicable, in the preliminary flight plan, when, for the destination aerodrome:

(i) meteorological conditions at the estimated time of use will be below the company's established aerodrome operating minima for that operation; or
(ii) meteorological information is not available.

17.12.2 Notwithstanding paragraphs 17.12.1.1 to 17.12.1.3, CAD may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve operational variations to alternate aerodrome selection criteria. The specific safety risk assessment shall include at least the:

(a) capabilities of the operator;
(b) overall capability of the aeroplane and its systems;
(c) available aerodrome technologies, capabilities and infrastructure;

(d) quality and reliability of meteorological information;
(e) identified hazards and safety risks associated with each alternate aerodrome variation; and
(f) specific mitigation measures.

17.12.3 The operator shall establish the estimated time of use of an aerodrome to allow for unexpected variations in departure time, flight time, and timing of meteorological conditions change. Normally a margin of one hour before and after earliest and latest time of arrival is considered acceptable to CAD.

17.12.4 At the flight planning stage, operators using Category II and Category III equipped aircraft must consider the possibility of a failure preventing this operation and ensure that the alternate chosen, has weather that is forecast to be at or above Category I limits.

17.13 Take-off Minima

17.13.1 A flight to be conducted in accordance with the instrument flight rules shall not take off from the departure aerodrome unless the meteorological conditions, at the time of use, are at or above the company's established aerodrome operating minima for that operation. Minimum conditions for take-off must be specified in terms of Runway Visual Range (RVR) and, where State Minima requires, cloud ceiling, and full account taken of all relevant factors. When the RVR is not reported, aeroplane commanders should assess the apparent RVR by noting the number of runway lights visible from the aircraft providing the relevant light spacing is known. This procedure is only to be used for the purposes of RVR assessment for take-off and in conditions when the assessment is greater than 150 metres. Factoring of meteorological visibility for take-off is not permitted.

17.13.2 Special rules applicable to certain types of aircraft are discussed in paragraph 17.17.

17.14 Landing Minima

17.14.1 *The Approach Ban.* A statement must be made setting out in what circumstances an approach may or may not be started or continued, based on the provisions of the AN(HK)O. The approach ban is applied to all intended approaches to land by a public transport aircraft. In effect, an aircraft making an approach to land may only descend below 1000 ft above the aerodrome elevation when the RVR, factored meteorological visibility or meteorological visibility reported for the intended runway or direction of landing is equal to or better than the minimum RVR or visibility specified for that runway or direction of landing, appropriate to the type of approach i.e. precision, non-precision or visual. The ban will apply even when the specified visual reference, as distinct from RVR, may have been achieved at or above 1000 ft above the aerodrome. Also an aircraft shall not continue an approach to land by flying below the relevant specified Decision Height/Altitude or the relevant specified Minimum Descent Height/Altitude, unless from that height/altitude the specified visual reference for landing is established and is maintained.

17.14.2 *Decision Height/Altitude and Minimum Descent Height/Altitude.* A Decision Height/Altitude (DH/A) or a Minimum Descent Height/ Altitude (MDH/A) must be specified for each precision and non-precision instrument approach procedure respectively for each runway or landing strip used. In determining the appropriate height or altitude, account must be taken of all relevant factors. Reference to ICAO Doc. 9365 shall be made for the method of calculation.

17.14.3 *Runway Visual Range (RVR).* Minimum values of RVR must be specified by the operator. For aerodromes and runways where RVR is not measured, operators must specify the minimum reported visibility below which an approach to land cannot be commenced or continued. The relationship between RVR and meteorological visibility is shown in ICAO Doc. 9365.

17.14.4 *Increments to minima.*

17.14.4.1 Specified values of DH/A, MDH/A and RVR are to be applied for commanders with only limited experience on the type of aircraft. Appropriate increments must also be applied when any unserviceability of instrumentation or systems significantly affects the performance and/or handling of the aircraft.

17.14.4.2 To ensure that an adequate margin of safety is observed in determining whether or not an approach and landing can be safely carried out at each alternate aerodrome, the operator shall specify for CAD's acceptance appropriate incremental values for height of cloud base and visibility to be added to the operator's established aerodrome operating minima.

17.15 **Minima for Visual Landing**

17.15.1 RVR or equivalent RVR or meteorological visibility must be established for all types of approaches to any runway; these minima apply also to partial or complete visual circuit and cloud break procedures. Details are given in ICAO Doc. 9365.

17.15.2 Minima consisting of an MDH/A, flight visibility, RVR or equivalent and a visual reference are to be specified for an instrument approach procedure to be followed by visual manoeuvring (circling) for landing. These minima apply where a pilot uses a radio aid to position, to within sight of the aerodrome, and then makes a partial circuit or other significant manoeuvre to line up for the approach and landing, e.g. a change of track of more than 30°.

17.15.3 The minimum height for all forms of circling is determined by reference to the relevant chart or AIP, consistent with the handling and performance characteristics of the aircraft. Absolute minima are given in ICAO Doc. 9365.

17.15.4 At some aerodromes it is necessary to restrict circling to a particular segment of the circuit, e.g. north of the extended centreline only, because of major obstacles or high ground. Any such restriction must be clearly indicated in the lists of operating minima.

17.15.5 For a visual circuit after a visual approach or when manoeuvring after an instrument approach, visual contact must be maintained with the ground. This will allow the aircraft to be positioned in relation to the aerodrome and remain within any notified visual manoeuvring area. Exceptionally, if visual reference is lost when circling to land from an instrument approach, the missed approach specified for that particular procedure must be followed. An initial climbing turn will be made towards the landing runway and, when overhead the aerodrome, establish the aircraft climbing on the missed approach track. As the circling manoeuvre may be accomplished in more than one direction and depending when visual reference is lost, different patterns will be required to establish the aircraft on the prescribed missed approach course.

17.16 Specification of Visual Reference

17.16.1 For precision approaches, instructions must be given on the minimum visual reference required at Decision Height (DH) or Decision Altitude (DA) and thereafter. The visual reference segment must contain sufficient physical features so that the aircraft's position relative to the desired flight path can be identified. It must include an element for lateral control, e.g. a cross bar of the Calvert approach lighting system or barrettes on approach lighting systems, where there are no cross bars.

17.16.2 The specified visual segment of a full Category II or III approach should contain the appropriate number of runway or approach lights.

17.16.3 For approaches using other aids and, when approach lighting is not available, the specified visual reference must include the desired point of touchdown, the "aiming point", on the runway of intended landing. If approach lights are available, it is not essential that the aiming point is in view at the MDH/A but the segment of lighting specified must contain at least 7 lights, which may be approach lights or runway lights or a combination of both.

17.16.4 Specifying visual references in diagrammatic form is permitted, provided that the specifications meet the above criteria.

17.17 Special Rules for Certain Aircraft

Certain groups of aircraft are subject to special statutory provisions in respect of aerodrome operating minima (see Schedule 15 of AN(HK)O). These limitations should be taken into account in establishing minima, which should be marked where necessary for operations by day only. If the operator's limitations because of the effect of the Regulations - are based on a specially reduced take-off weight, this must be indicated clearly in the listed minima.

17.18 Aerodromes Without Approach Aids

A statement must be made in the operations manual that aeroplanes with a maximum total weight exceeding 5700 kg, engaged in the public transport of passengers, are prohibited from operating into and out of an aerodrome not equipped with radio and a radio navigation aid, either at the aerodrome or elsewhere, to assist in the location of and approach to the aerodrome. Operators wishing to develop an instrument approach procedure at an aerodrome without approved aids should contact their assigned Inspector.

17.19 State and Special Minima at Foreign Aerodromes

17.19.1 Most foreign countries set mandatory operating minima which require compliance. In some instances, however, the authorities may permit the use of lower minima, on application by a Hong Kong operator and in consultation with CAD.

17.19.2 It is the responsibility of the operator to make a fresh application for special minima following changes in aerodrome facilities or other factors.

17.20 Heliport Operating Minima

17.20.1 No approach to land under instrument flying conditions to any heliport when the visibility is below 800M should be carried out unless RVR information or other means of accurate information is available.

18 HELICOPTER OPERATIONS OVER WATER

Cancelled –refers to CAD 360 Helicopter Supplement

19 LOADING

19.1 Loading Instructions

In order to carry cargo in what would normally be the passenger cabin an approved modification is usually necessary, taking into account the airworthiness requirements for the particular type of aircraft and the flight manual limitations.

NOTE: The requirements to be satisfied in order to gain approval for the carriage of cargo in passenger compartments are given in CAD 360 Part 2 Chapter 4.

19.1.1 The approval reference number of the appropriate approved modification must be shown in the operations manual or, if CAD has deemed that a modification is not necessary, the basis for CAD's acceptance.

19.1.2 Where no approval/acceptance has been granted and shown in the manual, cargo must not be carried other than in designated cargo compartments.

19.1.3 Instructions must provide guidance for traffic staff, handling agents and aircraft crew, as appropriate, on the loading, weight and balance of an aircraft and include instructions on:

(a) Controlling and promulgating the basic or Aircraft Prepared for Service (APS) weights and indices. Where used, all items of equipment that convert basic to APS weight must be listed;

(b) regulating the carriage and stowage of baggage and cargo in passenger compartments, including instructions on the amount of hand baggage allowed and how it is to be stowed. Emergency exits, gangways and dinghy launching stations must be kept clear during taxying, take-off and landing;

(c) carriage of Dangerous Goods;

(d) limitations on floor loading, the strength and distribution of attachment points, use of weight spreading devices and positioning and securing of ballast;

(e) checking that items of cargo or baggage allocated to particular compartments or holds are distributed and restrained correctly. The person responsible for the trim of the aircraft must give written instructions to the person responsible for loading the aircraft;

(f) advising the aircraft commander and cabin crew of seating restrictions;

(g) the effect of the maximum zero fuel weight, landing weight restrictions at planned destination, take off and climb performance requirements at the departure aerodrome and en route performance requirements on Regulated Take-Off Weight (RTOW);

(h) the care and maintenance of Unit Load Devices (ULD), responsibilities for

ensuring their fitness for use prior to loading and the procedure for directing damaged units to an approved organisation for repair;

(i) fuel loading limitations;

(j) where appropriate, limitations on loading for ferrying aircraft with one engine inoperative, Certificate of Airworthiness (C of A) tests or any other non-standard flight; and

(k) where applicable, the use of the standard weights or any notional weights given in exemptions granted by CAD.

19.2 **Cargo Loading Instructions**

These instructions must include the following additional details:

(a) diagrams and dimensions of cabin bays and cargo holds and compartments to facilitate the pre-planning of cargo distribution;

(b) the strength and usable directions of all lashing points and/ or rings and details of the spacing between lashing points;

(c) the types and working strengths of lashing provided, and stowage, when not in use;

(d) instructions concerning the loading of stretchers, carriage of livestock or other unusual loads;

(e) where appropriate, the handling, loading and securing of pallets or containers;

(f) a care and maintenance programme for ULDs; these include cargo containers, nets and pallets. Guidance must be given to both loading and maintenance personnel on the division of duties in respect of ULD serviceability;

(g) instructions on the use of passenger aircraft for the carriage of cargo;

(h) guidance on the duties and responsibilities of individuals when making cabin configuration changes. These changes require a Certificate of Release to Service (CRS). Further information on these procedures can be obtained from the Airworthiness Office;

(i) where appropriate, instructions on the loading and securing of mail bags or similar cargo, including checking for leakage or spillage and consequential aircraft contamination; and

(j) a statement that a load/trim sheet cannot serve as a loading instruction and a trim slide rule does not dispense with the requirement to complete a load sheet.

(k) where appropriate, instructions on the loading and securing of mail bags or similar cargo, including checking for leakage or spillage and consequential aircraft contamination; and

(l) a statement that a load/trim sheet cannot serve as a loading instruction and a trim slide rule does not dispense with the requirement to complete a load sheet.

19.3 The position of the laden centre of gravity must be given on the load sheet. For this purpose, a trim sheet may be regarded as part of the load sheet, even though it can be a separate document. The complete document must include particulars of how the load is distributed and special attention paid to the wording of the loading certificate. This may be met by establishing that the Centre of Gravity (C of G) lies within the permitted limits and it is not necessary to determine the precise position, unless it affects aircraft handling or other factors. The load sheet must bear the reference of the APS form used and, if standard weights have been used, an endorsement to that effect.

19.4 Where a 'loading plan' method is used, the basic assumptions upon which the plan is formulated must be given and must specify C of G limits more stringent than those permissible under the C of A. It must also be stated that loading in accordance with the 'plan' ensures that the laden C of G always falls within the restricted limits. If this is done, a simple statement on the load sheet that the laden C of G is between the operator's more stringent limits is acceptable.

19.5 Operators must provide traffic staff and handling agents, including agents at overseas aerodromes, with:

(a) loading instructions, including the principles of effective cargo restraint;
(b) current APS forms for all types, marks and variants of aircraft used; and
(c) details of the RTOW and fuel load for each flight.

19.6 Where traffic staff and handling agents are responsible for calculating the RTOW, operators must ensure that they are provided with all relevant information and are competent.

19.7 **Loadsheet Contents**

19.7.1 The load sheet, together with the APS form, must account for all items of the laden weight. Although they may not always be specified individually, the following are examples of items to be included:

(a) Fuel, water methanol, oil, hydraulic fluid, drinking water, toilet water, de-icing fluid;

(b) passenger seats, children's cots, cabin floor covering, removable bulkheads;

(c) galley equipment including urns, hot cups;

(d) food and beverages to be consumed in flight;

(e) bar stocks including the weight of the boxes or other containers;

(f) navigation bag or aircraft library and navigation equipment, unless these items are included in the APS weight;

(g) passengers' hold baggage;

(h) passengers' cabin baggage, unless this is accounted for elsewhere;

(i) flight spares and tools, spare hydraulic or de-icing fluid;

(j) cargo;

(k) aircraft crew baggage;

(l) dinghies, all life-jackets flotation cots, survival packs, blankets, pillows and similar equipment;

(m) load spreading devices, lashing, ballast;

(n) all items of removable equipment and removable radios carried; and

(o) when livestock is carried, food and necessary equipment.

19.8 Loadsheets must show whether actual, standard, or approved notional weights of passengers and their baggage are used.

19.9 **Helicopter Loading**

Cancelled – refers to CAD 360 Helicopter Supplement

20 DANGEROUS GOODS, WEAPONS AND MUNITIONS OF WAR

20.1 Carriage of Dangerous Goods

20.1.1 The Air Navigation (Dangerous Goods) Regulations set out the applicable requirements, including those relating to operators' responsibilities. They require that a specific approval in a form of a written permission be issued by CAD before the operators are authorized to carry dangerous goods (DG) and such goods are carried in accordance with the International Civil Aviation Organisation (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284).

20.1.2 Such DG Permission is granted by CAD Dangerous Goods Office when CAD is satisfied as to the adequacy of staff training and procedures. Following the grant of DG Permission, the operator should also check their AOC to see if an AOC variation is required and contact CAD Flight Standards and Airworthiness Office where needed.

20.1.3 Detailed requirements of crew and staff training and procedures can be found in Chapter 14, Appendix 2 and Attachment K to ICAO Annex 6 Part I, Schedule 16 to AN(HK)O, ICAO Annex 18 and Doc 9284 [Remarks: The latter three are comprehensive requirements for the safe transportation of DG for all relevant personnel, e.g. staff of operators, shippers, and are being enforced by CAD Dangerous Goods Office].

20.1.4 Certain items described generally as DG do not require a Permission for carriage. These include COMAT, certain items carried by passengers or crew and items required for use in flight to provide veterinary aid to an animal or medical aid to a person. Guidance must be given on what items can be carried in all these circumstances.

20.1.5 Operations manuals must state whether or not a Permission for the carriage of DG is held.

20.1.6 Where a Permission is not held, DG information and instructions in accordance with Schedule 11 to AN(HK)O and Chapter 14, Appendix 2 and Attachment K to ICAO Annex 6 Part 1 must still be included in the operations manual. Other relevant staff training and procedures applicable to these operators not authorized to carry DG (such as procedures to prevent the inadvertent carriage of undeclared DG on board aircraft specified under ICAO Doc 9284) must be included in the appropriate manuals which would be reviewed by CAD Dangerous Goods Office.

20.1.7 Where a Permission for the carriage of DG is held, DG information must be given to enable operator's staff or the ground handling agent to carry out their responsibilities. The instructions apply from the time DG are accepted for carriage until they cease to be in the care of the operator or ground handling agent. Operators and their handling agents are expected to observe other relevant DG storage requirements as stipulated by the Fire Services Department in Hong Kong or other competent authorities at outstations. The general guidelines on DG storage in Hong Kong are in Appendix F to this chapter.

20.1.8 Accidents and incidents arising from the carriage of dangerous goods are reportable under the Mandatory Occurrence Reporting Scheme (see paragraph 24).

20.1.9 Detailed DG requirements are stipulated in Schedule 16 to the AN(HK)O, ICAO Doc 9284 and ICAO Doc 9481. Please contact CAD Dangerous Goods Office for further advice.

20.2 Carriage of Weapons and Munitions of War (MUW)

20.2.1 Munitions of war shall only be carried with the written permission of CAD. Munitions of war are any weapon, ammunition or article containing an explosive or noxious liquid, gas or other thing which is designed or made for use in warfare or against persons, including parts, whether components or accessories, for such weapon, ammunition or article. In Hong Kong, MUW on board aircraft are mostly arms and ammunition for law enforcement, sporting and filming use.

20.2.2 Accidents and incidents arising from the carriage of weapons and munitions of war are reportable under the Mandatory Occurrence Reporting Scheme (see paragraph 24).

21 CARRIAGE OF ANIMALS

21.1 General

21.1.1 Operators who intend to carry animals must hold a current edition of the International Air Transport Association (IATA) Live Animals Regulations. The Regulations give guidance on such matters as the types of containers that should be used, labelling and marking of containers, animal health and hygiene, feeding, loading and sedation.

21.2 Livestock, Horses and Other Large Animals

21.2.1 Where livestock or other large animals are carried, the information must be given on action in emergencies, as well as the carriage and use of animal first aid and emergency kits, including the use of the captive bolt humane killer.

21.2.2 The determination of the weight of the consignment and where this weight is recorded on the load-sheet must be given. Guidance on loading should include:

(a) the weight, dimensions, construction, method of attachment and required restraint for horse boxes or animal pens;

(b) the checks necessary, before loading horse boxes or animal pens, on the general condition and serviceability of fitting and lashing points;

(c) the loading of horse boxes and the tethering of horses;

(d) the stowage of loose equipment such as food and water containers and horse paraphernalia; and

(e) the number and type of food and water containers and the quantities of food and water required, based on the duration of the flight and the number of animals carried.

21.2.3 Instructions must be given on checking an aircraft after a flight on which livestock, horses or other large animals have been carried for damage to the structure, fittings, wiring etc and for any adverse effects resulting from high humidity and urination.

21.2.4 When horses are carried, the minimum number of grooms for particular loading configurations must be specified.

22 GROUND HANDLING AND AIRCRAFT DISPATCH

22.1 Operators are responsible for the safe dispatch of their aircraft following cargo and passenger loading, refuelling, cleaning, catering and the completion of preflight maintenance and servicing. Any damage to the aircraft must be reported and assessed for airworthiness significance prior to flight.

22.2 All flights should be planned so that the diversion time to an aerodrome where a safe landing could be made does not exceed the cargo compartment fire suppression time capability of the aeroplane, when one is identified in the relevant aeroplane documentation (e.g. Aircraft Flight Manual), reduced by an operational safety margin.

Note 1: Cargo compartment fire suppression time capabilities will be identified in the relevant aeroplane documentation when they are to be considered for the operation.

Note 2: Fifteen minutes is considered as a reasonable operational safety margin.

Note 3: Refer to CAD 513 for considerations of time capability of cargo compartment fire suppression systems for aeroplanes engaged in EDTO.

22.3 Instructions must be given to ensure that dispatch tasks are carried out in a standard manner, that each task is fully and correctly completed, and that any damage is reported immediately.

22.4 Instructions on training requirements, subcontracting policies, handling and loading/unloading processes, SOP and practices for all ground handling operations should be developed in accordance with ICAO Doc 10121, Manual on Ground Handling, the IATA Ground Operations Manual, IATA Airport Handling Manual and the IATA Safety Audit of Ground Operations (ISAGO) Standards Manual, as appropriate and in the form of a Ground / Aircraft Handling Manual.

22.5 Where dispatch tasks are contracted out to other organisations, contracts must include the operator's requirements for safe conduct of the task and the performance of the contractor, in respect of safety, must be monitored regularly. Even when all or part of the functions and tasks have been contracted to contractor, operators' ground handling responsibility must be permanently maintained.

23 ACCIDENT PREVENTION AND FLIGHT SAFETY

23.1 Operators are to establish and maintain accident prevention and flight safety programmes under the supervision of a person specifically nominated for the purpose. Operators should refer to CAD 739, which contains information and guidance on Flight Data Analysis Programmes.

24 ACCIDENT REPORTING

24.1 Provision must be made for all operating staff to have ready access to the prescribed requirements for the reporting and investigation of accidents or serious incidents. In particular, operating staff should be familiar with the definitions used in the legislation, the duty to furnish information, and the rules governing the removal of damaged aircraft.

24.2 Instructions must be issued on the reporting of accidents or serious incidents occurring overseas to the regulating authority of the country concerned and the action necessary to prevent removal or interference with any part of the aircraft without proper permission. This is in addition to operators' existing responsibility to inform the Chief Inspector, Air Accident Investigation Authority (AAIA). The operations manual should contain the address and telephone numbers of AAIA.

24.3 If doubt exists on whether an occurrence is an accident, a serious incident or an incident, it should be reported to AAIA who will decide on its classification.

24.4 An operator shall ensure, to the extent possible, in the event the aircraft becomes involved in an accident or a serious incident, the preservation of all related flight recorder records and, if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with Hong Kong Civil Aviation (Investigation of Accidents) Regulations. Flight recorder means flight data recorder and/or cockpit voice recorder, where applicable.

24.5 To preserve flight recorder records, flight recorders shall be de-activated upon completion of flight time following an accident or a serious incident. The flight recorders shall not be re-activated before their disposition as determined by the Inspector of Accidents in accordance with Hong Kong Civil Aviation (Investigation of Accidents) Regulations. Flight recorder means flight data recorder and/or cockpit voice recorder, where applicable.

24.6 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information of the flight data recorder should be maintained by the operator. The documentation must be sufficient to ensure that accident investigation authorities have the necessary information to read the data in engineering units.

25 OCCURRENCE REPORTING

25.1 Operators and commanders of Hong Kong registered public transport aircraft shall submit to CAD without delay, a report of any act of unlawful interference or any other occurrence which may endanger or, unless corrected, would have endangered an aircraft. Types of occurrence which must be reported are prescribed in the Air Navigation (General) Regulations.

25.2 Operations manuals must specify the persons responsible for raising occurrence reports and give such guidance as will enable them to comply with the statutory requirements.

25.3 Operators of aircraft that do not fall within the MOR scheme should include instructions in the manuals on the procedure for the reporting of incidents.

25.4 Any accident or serious incident notified in pursuance of the Hong Kong Civil Aviation (Investigation of Accidents) Regulations shall not constitute a reportable occurrence for the purpose of Mandatory Occurrence Reporting.

25.5 Operators must give guidance on the submission of Mandatory Occurrence Reports (MORs) relating to Extended Diversion Time Operations (EDTO) aircraft. Any occurrence report on aircraft types subject to EDTO specific approval, must be prominently annotated 'EDTO'.

26 LOW VISIBILITY OPERATIONS (LVO)

26.1 Operators wishing to operate to Categories II/III limits and/or the appropriate operational credits with advanced aircraft are to submit their proposed procedures to CAD for specific approval, prior to including such procedures in their operations manual. CAD requirements for LVO are contained in CAD 359 – Low Visibility Operations.

27 EXTENDED DIVERSION TIME OPERATIONS (EDTO)

27.1 Unless the operation has been specifically approved by CAD, an aeroplane with two or more turbine engines shall not be operated on a route where the diversion time to an ERA from any point on the route, calculated in ISA and still-air conditions at the one-engine-inoperative (OEI) cruise speed for aeroplanes with two turbine engines and at the all-engines-operating (AEO) cruise speed for aeroplanes with more than two turbine engines, exceeds a threshold time established for such operations. The specific approval shall identify the applicable threshold time and maximum diversion time established for each particular aeroplane and engine combination.

27.2 When the diversion time exceeds the threshold time, the operation is considered to be an EDTO. For CAD, "Extended Range Twin Engined Operations (ETOPS)" may be used to describe EDTO for aeroplanes with two turbine engines.

27.3 Threshold time is defined as the range, expressed in time, to an en-route alternate aerodrome, whereby any time beyond requires a specific approval for EDTO. The threshold time for twin-engined aeroplanes which are not limited by the certificate of airworthiness to the carriage of less than 20 passengers (AN(HK)O Schedule 15 regulations 4(5)) is 60 minutes. The threshold time for aeroplanes with more than two turbine engines is 180 minutes. Operators who wish to operate under EDTO are to submit their proposed procedures to CAD prior to including such procedures in their operations manual, in order that specific approval may be granted. CAD requirements for EDTO are contained in CAD 513 for extended operations up to 180 minutes. Any extension beyond 180 minutes will be considered by CAD and subject to operator's compliance with information contained in FAA Advisory Circular No. 120-42B.

28 EDTO FOR TWIN-ENGINED BUSINESS JET

28.1 Operators wishing to operate twin-engined aeroplane for more than 90 minutes flying time in still air at the all power units economical cruising speed from a suitable en-route alternate aerodrome and which are limited by the certificate of airworthiness to the carriage of less than 20 passengers, are to submit their proposed procedures together with a safety assessment of the aircraft one engine inoperative capability to CAD, requesting an exemption to the ANHKO Schedule 15 regulation 4(5).

29 MIXED FLEET FLYING (MFF)

29.1 Operators seeking MFF approval must operate the aircrafts recommended by the manufacturer as conducive to MFF and provide a detailed plan, including proposed procedures for MFF training, MFF operations, experience levels of the crews, to CAD for approval, prior to including such procedures in their operations manual. The initial MFF approval will be contingent upon a successful trial of MFF operations. CAD guidelines for MFF are outlined at Appendix G.

30 COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

30.1 Communication Equipment

30.1.1 An aeroplane or a helicopter shall be provided with radio communication equipment capable of:

(a) conducting two-way communication for aerodrome control purposes;

(b) receiving meteorological information at any time during flight; and

(c) conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on which frequencies as may be prescribed by the appropriate authority.

30.1.2 The radio communication equipment required in accordance with the above paragraph shall provide for communications on the aeronautical emergency frequency 121.5 MHz.

30.1.3 For operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), an aircraft shall, in addition to the requirements specified in 30.1.1 and 30.1.2:

(a) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s);

(b) have information relevant to the aircraft RCP specification capabilities listed in the flight manual or other aircraft documentation approved by the State of Design or CAD; and

(c) have information relevant to the aircraft RCP specification capabilities included in the MEL.

Note: All operators requiring performance-based communication and surveillance (PBCS) approval shall apply to CAD using Form DCA 4049 which can be downloaded from CAD website at https://www.cad.gov.hk/english/applications.html, and refer to ICAO PBCS Manual (Doc 9869).

30.1.4 For operations where an RCP specification for PBC has been prescribed, the following shall be established and documented by the operator:

(a) normal and abnormal procedures, including contingency procedures;

(b) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;

(c) a training programme for relevant personnel consistent with the intended operations; and

(d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

30.1.5 In respect of those aircraft mentioned in paragraph 30.1.3, the operator shall ensure adequate provisions exist for:

(a) submitting the reports to CAD regarding observed communication performance issued by monitoring programmes established in accordance with ICAO Annex 11, Chapter 3; and

(b) taking immediate corrective actions for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RCP specification.

Note: In accordance with Article 14 of AN(HK)O, the aircraft shall be equipped with radio and radio navigation equipment required by Schedule 6 of AN(HK)O and the equipment installed in aircraft shall be approved by CAD.

30.2 Navigation Equipment

30.2.1 An aeroplane or a helicopter shall be provided with navigation equipment which enable it to proceed:

(a) in accordance with its operational flight plan; and

(b) in accordance with the requirements of air traffic services.

Except when, if not so precluded by the appropriate authority, navigation for flights under the visual flight rules is accomplished by visual reference to landmarks.

Note: In accordance with Article 18(4) of AN(HK)O, an aircraft for public transport shall carry navigational equipment approved by CAD when operating to areas specified in Schedule 8 of AN(HK)O. Also, in accordance with Article 14 of AN(HK)O, the aircraft shall be equipped with radio and radio navigation equipment required by Schedule 6 of AN(HK)O and the equipment installed in aircraft shall be approved by CAD.

30.2.2 For operations where a navigation specification for performance-based navigation (PBN) (i.e. required navigation performance (RNP) or area navigation (RNAV)) specification has been prescribed, an aeroplane or a helicopter shall:

(a) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specifications; and

(b) have information relevant to the aircraft navigation specification capabilities listed in the flight manual or other aircraft documentation approved by the State of the Design or CAD; and

(c) have information relevant to the aircraft navigation specification capabilities included in the MEL.

(d) be specifically approved by CAD for operations in such airspace in accordance with Article 36A of AN(HK)O.

Note: All operators requiring PBN specific approval shall apply to CAD using the appropriate DCA Form (e.g. DCA 4046 to DCA 4047) which can be downloaded from CAD website at http://www.cad.gov.hk/english/applications.html/, and refer to the ICAO PBN Manual (Doc 9613).

30.2.3 For operations where a navigation specification for PBN has been prescribed, the following shall be established and documented by the operator:

(a) normal and abnormal procedures including contingency procedures;

(b) flight crew qualification and proficiency requirements in accordance with the appropriate navigation specifications;

(c) a training programme for relevant personnel consistent with the intended operations; and

(d) appropriate maintenance procedures to ensure continued airworthiness in accordance with the appropriate navigation specifications.

Note 1: Guidance on safety risks and mitigations for PBN operations, in accordance with SMS, are contained in the Performance-based Navigation (PBN) Operational Approval Manual (Doc 9997).

Note 2: Electronic navigation data management is an integral part of normal and abnormal procedures.

30.2.4 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, minimum navigation performance specification (MNPS) are prescribed, an aeroplane shall be provided with navigation equipment which:

(a) continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and

(b) has been approved by CAD for MNPS operations concerned in accordance with Article 36 of AN(HK)O for all aircraft operating through the MNPS airspace as prescribed in Schedule 15 of AN(HK)O.

Note: The prescribed MNPS and the procedures governing their application are published in the Regional Supplementary Procedures (Doc 7030) and those for the North Atlantic MNPS Airspace are in the current edition of the "Guidance concerning Air Navigation and above the North Atlantic MNPS Airspace" (NAT 007) (see an example of MNPS airspace in North Atlantic map in Chapter 4 Appendix A).

30.3 Surveillance Equipment

30.3.1 An aircraft shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.

30.3.2 For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance (PBS), an aircraft shall, in addition to the requirements specified in 30.3.1:

(a) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);

(b) have information relevant to the aircraft RSP specification capabilities listed in the flight manual or other aircraft documentation approved by the State of Design or CAD; and

(c) have information relevant to the aircraft RSP specification capabilities included in the MEL.

Note 1: Information on surveillance equipment is contained in the Aeronautical Surveillance Manual (Doc 9924).

Note 2: Information on RSP specifications for PBS is contained in the ICAO PBCS Manual (Doc 9869.

Note 3: All operators requiring PBCS approval shall apply to CAD using Form DCA 4049 which can be downloaded from CAD website at https://www.cad.gov.hk/english/applications.html, and refer to ICAO PBCS Manual (Doc 9869).

30.3.3 For operations where an RSP specification for PBS has been prescribed, the following shall be established and documented by the operator:

(a) normal and abnormal procedures, including contingency procedures;

(b) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;

(c) a training programme for relevant personnel consistent with the intended operations; and

(d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.

30.3.4 In respect of those aircraft mentioned in paragraph 30.3.2, the operator shall ensure adequate provisions exist for:

(a) submitting the reports to CAD regarding observed surveillance performance issued by monitoring programmes established in accordance with ICAO Annex 11, Chapter 3; and

(b) taking immediate corrective actions for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RSP specification.

31 REDUCED VERTICAL SEPARATION MINIMA (RVSM) OPERATIONS

31.1 Operators wishing to operate in RVSM airspace are required to submit their proposed procedures to CAD for specific approval, prior to including such procedures in their operations manual. Guidance material may be found in ICAO Doc. 7030, Regional Supplementary Procedures and ICAO Doc. 9574, Manual on Implementation of a 300 M (1000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive. All operators requiring RVSM specific approval shall apply to CAD using Form DCA4040 which is available in CAD FSAD Office.

31.2 For flights in RVSM airspace, an aircraft shall be provided with equipment which is capable of:

(a) indicating to the flight crew the flight level being flown;

(b) automatically maintaining a selected flight level;

(c) providing an alert to the flight crew when a deviation occurs from the selected flight level. The threshold for the alert shall not exceed ±90 m (300 ft);

(d) automatically reporting pressure-altitude; and

(e) the aircraft shall demonstrate a vertical navigation performance in accordance with ICAO Annex 6 Part 1 Appendix 4.

31.3 The criteria for granting the RVSM specific approval are:

(a) the vertical navigation performance capability of the aeroplane satisfies the requirements specified in ICAO Annex 6 Part I Appendix 4;

(b) the operator has instituted appropriate procedures in respect of continuing airworthiness (maintenance and repair) practices and programmes (Reference can be made to the document mentioned in the note below); and

(c) the operator has instituted appropriate flight crew procedures for operations in RVSM airspace (Reference can be made to the document mentioned in the note below).

Note: EASA Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Part-SPA Subpart D is used as the reference acceptance criteria for granting the RVSM specific approval.

31.4 An operator with a RVSM specific approval must make arrangement to monitor the height-keeping performance of their aircraft on an on-going basis. As a minimum, the operator shall monitor the height-keeping performance of two aeroplanes of each aircraft type grouping at least once every two years or within intervals of 1,000 flight hours per aeroplane, whichever period is longer. If an operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period of 2 years. The operator should establish a monitoring schedule for different aircraft group and provide CAD with the monitoring data and monitoring methodology on an annual basis or when required.

Note: Monitoring data from any regional monitoring agencies established in accordance with Annex 11, 3.3.5.2 may be used to satisfy the requirement.

31.5 Additional airworthiness requirements can be found in the Airworthiness Notice (http://www.cad.gov.hk/english/HKAN.html).

32 COSMIC RADIATION

32.1 Operators of public transport aircraft registered in Hong Kong shall, in respect of any flight by that aircraft during which it may fly at an altitude in excess of 26,000 ft, keep a record of the total dose of cosmic radiation to which the crew are exposed together with the names of that crew. The crew has the meaning assigned to it by Article 98 paragraph (4) of the Air Navigation (Hong Kong) Order 1995.

32.2 Where the record (e.g. CARI-6 computer programme) indicates that a crewmember may achieve exposure of more than 4mSv in any 12 calendar month period, then that crewmember should be rostered accordingly to ensure that his/her annual exposure does not exceed 6mSv. Female crewmember should inform the operator as soon as her pregnancy is certified by a medical doctor. The operator should then made appropriate arrangements to ensure that the exposure to the fetus will be "as low as reasonably achievable" and not exceeding an accumulated value of 1mSv when the concerned crewmember carries out her assigned duties during the pregnancy period.

32.3 For flights intended to be operated above 49,000 ft, operators, as defined in paragraph 32.1 above, are required to:

(a) apply to CAD for an exemption from Scale W of Schedule 5 of the Air Navigation (Hong Kong) Order 1995;

(b) provide information which will enable the pilot to determine the best course of action to take in the event of exposure to solar cosmic radiation; and

(c) develop procedures in the event that a decision to descend is taken, covering:
- the necessity of giving the appropriate ATS unit, prior warning of the situation and of obtaining a provisional descent clearance;
- the action to be taken in the event that communication with the ATS unit cannot be established or is interrupted.

32.4 Inspectors will review cosmic radiation records when conducting AOC inspections.

33 INTERCEPTION PROCEDURE

In accordance with the AN(HK)O Schedule 12, a copy of the following notified procedures must be carried on board the aircraft:

(a) Procedures to be followed by the pilot in command of an intercepted aircraft; and

(b) notified visual signals for use by intercepting and intercepted aircraft.

For instance, these are available in reference publications such as the Hong Kong Aeronautical Information Publication (AIP) and the Aerad Flight Guide Supplement.

34 ELECTRONIC FLIGHT BAG (EFB) OPERATIONS

34.1 Traditionally all documentation and information available to flight crew for use on the flight deck have been in paper format. Much of this information is now available in electronic format. Operators wishing to operate EFB are to submit their proposed procedures to CAD for specific approval, prior to including such procedures in their operations manual.

34.2 Where portable EFBs are used on board, the operator shall ensure that they do not affect the performance of the aircraft systems, equipment or the ability to operate the aircraft.

34.3 Where EFBs are used on board an aircraft the operator shall:

(a) assess the safety risk(s) associated with each EFB function;

(b) establish and document the procedures for the use of, and training requirements for, the device and each EFB function; and

(c) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

34.4 For EFB specific approval, the applicant shall demonstrate, but not limited to the following, to CAD that:

(a) the EFB equipment and its associated installation hardware, including interaction with aircraft systems if applicable, meet the appropriate airworthiness certification requirements;

(b) the operator has assessed the safety risks associated with the operations supported by the EFB function(s);

(c) the operator has established requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);

(d) the operator has established and documented procedures for the management of the EFB function(s) including any database it may use; and

(e) the operator has established and documented the procedures for the use of, and training requirements for, the EFB and the EFB function(s).

Note: Guidance on Electronic Navigation Data Management is contained in ICAO Annex 6 Part One, Chapter 7.

34.5 Futher details of the assessment to the application of EFB Specific Approval should refer to CAD562 Electronic Flight Bag (EFB). Any operators requiring EFB specific approval shall apply to CAD using Form DCA4041. The document CAD562 and application form DCA4041 are available on CAD Website.

35 AIRCRAFT EQUIPPED WITH AUTOMATIC LANDING SYSTEMS, A HEAD-UP DISPLAYS (HUD) OR EQUIVALENT DISPLAYS, ENHANCED VISION SYSTEMS (EVS), SYNTHETIC VISION SYSTEMS (SVS) AND/OR COMBINED VISION SYSTEMS (CVS)

35.1 Under ICAO Annex 6 Part I and Part III, EVS means a system to display electronic real-time images of the external scene achieved through the use of image sensors, whereas HUD means a display system that presents flight information into the pilot's forward field of view.

35.2 When aeroplanes or helicopters are equipped with HUD and/or EVS, operators shall include the instructions and training requirements for the use of HUD and EVS equipment in the operations and/or training manuals where applicable.

35.3 Notwithstanding the requirements for the use of advanced aircraft systems for operational credit, where aircrafts are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, criteria for the use of such systems for the safe operation of an aircraft shall follow the guidance in the Manual of All-Weather Operations (Doc 9365).

Note: Automatic landing system – Helicopter is an automatic approach using airborne systems which provide automatic control of the flight path, to a point aligned with the landing surface, from which the pilot can transition to a safe landing by means of natural vision without the use of automatic control.

35.4 When operational credits have been granted by CAD as per paragraph 35.6 and 35.7, the use of that system becomes essential for the safety of such operations and is subject to a specific approval.

35.5 The use of these systems solely for enhanced situational awareness, reduced flight technical error and/or reduced workload is an important "safety feature" but does not require a specific approval.

35.6 When operators wish to use HUD or equivalent displays EVS, SVS or CVS to gain operational credit(s), such as:

(a) operating in visibilities lower than the normal aerodrome operating minima or heliport operating minima (i.e. lower minima for approach and landing operations);

(b) reducing or satisfying the visibility requirements; or

(c) requiring fewer ground facilities as compensated for by airborne capabilities, approval must be obtained from CAD in writing prior to the use of such systems. To support such approval, the instructions and training requirements, and also the instructions for determining the aerodrome operating minima or heliport operating minima for instrument approaches using HUD, equivalent displays and vision systems shall be included in the operations and/or training manuals.

35.7 To approve the operational use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS for operational credits, the applicant shall demonstrate to CAD that:

(a) the equipment meets the appropriate airworthiness certification requirements;

(b) the operator has carried out a safety risk assessment of the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS;

(c) the operator has established and documented the instructions, training requirements and procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS equipment as applicable.

Note: Further guidance on HUD, Equivalent Displays and Vision Systems is contained in ICAO Annex 6 Part I Attachment H and in the ICAO Manual of All-Weather Operations (Doc 9365).

36 (RESERVED)

37 AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST (ADS-B) OUT OPERATIONS

37.1 ICAO's Asia-Pacific Regional Group has decided to use the 1090MHz (Mode S) Extended Squitter datalink as the globally interoperable link for ADS-B operations. ICAO has also issued a number of technical and operational standards to support its introduction.

37.2 Operators wishing to operate in ADS-B airspace are to submit their proposed procedures to CAD for acceptance, prior to including such procedures in their operations manual. All operators requiring ADS-B approval shall apply to CAD using Form DCA4042 which could be downloaded from CAD website at http://www.cad.gov.hk/english/applications.html.

37.3 For flights in ADS-B airspace, an aircraft shall be equipped with either:

(a) The ADS-B equipages that have been certificated as meeting EASA Acceptable Means of Compliance AMC 20-24 'Certification Considerations for Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) via 1090 MHZ Extended Squitter', or

(b) The ADS-B equipages that meet the equipment configuration standards of Australia Civil Aviation Order 20.18 Appendix XI.

37.4 The criteria for granting the ADS-B approval are:

(a) The continuing airworthiness of ADS-B system must be assured. As part of the operational approval process, existing established maintenance practices or a proposed maintenance programme for the aircraft needs to be reviewed to ensure that it meets relevant requirements;

(b) The Minimum Equipment List needs to reflect the functional requirements of the ADS-B system;

(c) Appropriate flight operations training programme and operational procedures are established to ensure that pilots are knowledgeable about ADS-B operations and their onboard operational equipment.

Note: EASA Acceptable Means of Compliance AMC 20-24 is used as the reference acceptance criteria for granting the ADS-B approval.

38 OPERATING CONSIDERATIONS AND FACILITIES

38.1 An operator shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities available and directly required on such flight, for the safe operation of aircraft and the protection of the passengers, are adequate for the type of operation under which the flight is to be conducted and are adequately operated for this purpose. The relevant provisions for compliance by operators are in the AN(HK)O.

38.2 An operator shall ensure that a flight will not commence or continue as planned unless it has been ascertained by every reasonable means available that the airspace containing the intended route from aerodrome of departure to aerodrome of arrival, including the intended take-off, destination and en-route alternate aerodromes, can be safely used for the planned operation.

Note: "Reasonable means" refers to the use, at the point of departure or while the aircraft is in flight, of information available to the operator either through official information published by the aeronautical information services (including but not limited to Aeronautical Information Publication Hong Kong (AIP HK), NOTAMS, CAD Flight Operations Notices (FONs) etc.) or readily obtainable from other sources.

38.3 When intending to operate over or near conflict zones, a risk assessment shall be conducted and appropriate risk mitigation measures taken to ensure a safe flight. Reference on risk assessment can be made to ICAO Safety Management Manual (Doc 9859) and ICAO Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones (Doc 10084).

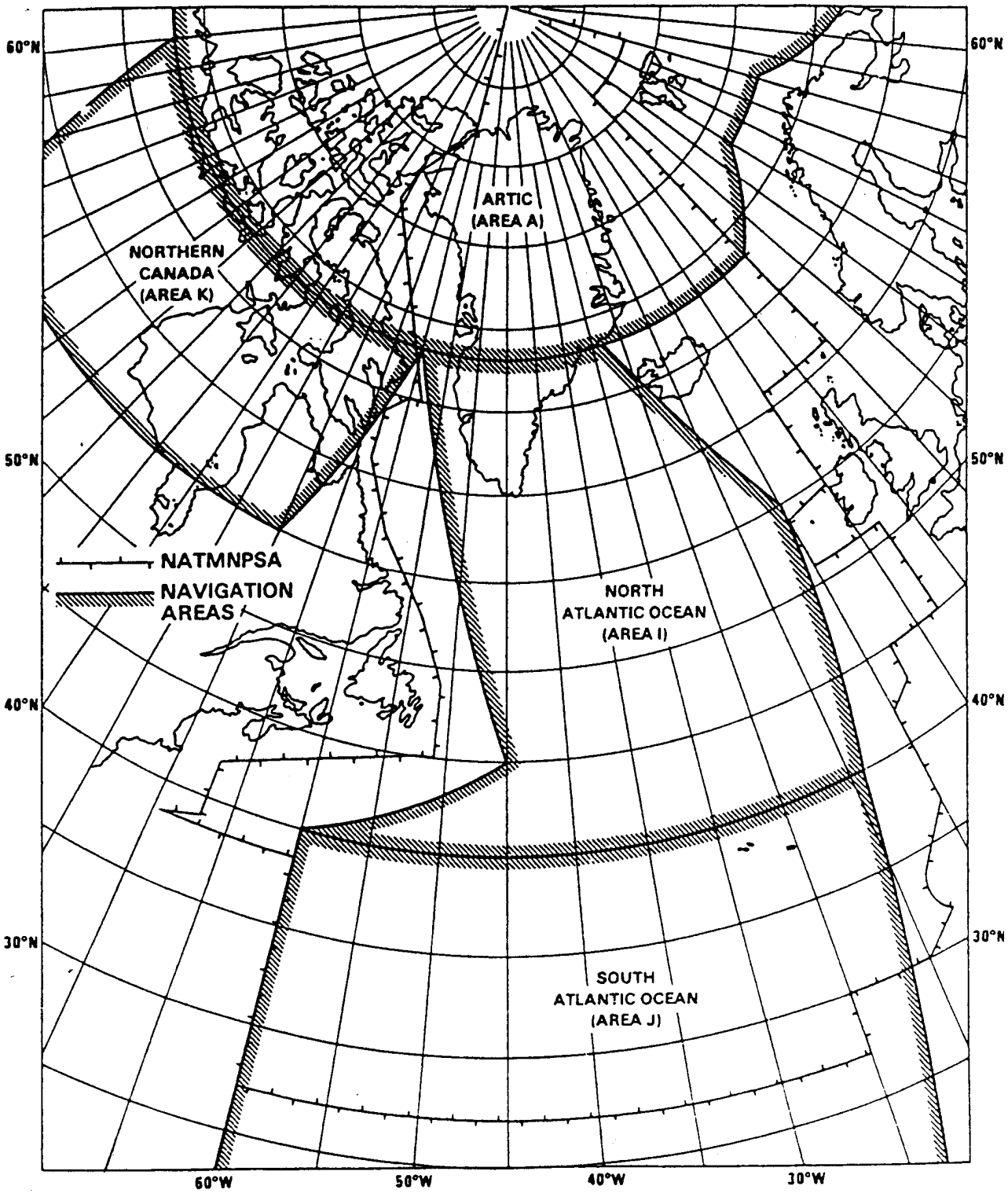
38.4 An operator shall ensure that any inadequacy of facilities observed in the course of operations is reported to the authority responsible for them, without undue delay.

38.5 An operator shall, as part of its safety management system, assess the level of rescue and fire fighting service (RFFS) protection available at any aerodrome intended to be specified in the operational flight plan in order to ensure that an acceptable level of protection is available for the aeroplane intended to be used.

38.6 Information related to the level of RFFS protection that is deemed acceptable by the operator shall be contained in the operations manual after acceptance by CAD.

Note: Appendix C of this chapter reproduced ICAO Annex 6 Part I Attachment J which contains guidance on assessing an acceptable level of RFFS protection at aerodromes.

CHAPTER 4 APPENDIX A - NORTH ATLANTIC MNPS AIRSPACE



*Note: The boundaries shown were **for reference only** and correct at the time of publication in November 2000 (Amdt 9), but operators must confirm the current co-ordinates of MNPS and Schedule 8 areas specified in AN(HK)O 1995.*

CHAPTER 4 APPENDIX B - AERODROME OPERATING MINIMA CALCULATIONS

Cancelled –refer to ICAO Doc 9365 Manual of All-Weather Operations

CHAPTER 4 APPENDIX C - RESCUE AND FIRE FIGHTING SERVICES (RFFS) LEVELS

Note: The contents of this Appendix are reproduced from ICAO Annex 6 Part I Attachment I.

ATTACHMENT J. RESCUE AND FIRE FIGHTING SERVICES (RFFS) LEVELS

1. Purpose and scope

1.1 Introduction

The purpose of this Attachment is to provide guidance for assessing the level of RFFS deemed acceptable by aeroplane operators using aerodromes for differing purposes. This guidance does not relieve the operator from the obligation to ensure that an acceptable level of protection is available for the aeroplane intended to be used.

1.2 Basic concepts

1.2.1 For flight planning purposes, an aeroplane operator should utilize an aerodrome whose RFFS category, as required by Annex 14, Volume I, Chapter 9, 9.2, matches or exceeds the aeroplane's RFFS category. Some aerodromes currently used do not, however, meet these requirements. Furthermore, Annex 14, Volume I provisions relate to the level of aerodrome RFFS to be provided for aeroplanes normally using an aerodrome; hence, this level of RFFS protection does not take into account aeroplanes for which the aerodrome is selected as an alternative aerodrome.

1.2.2 If an aerodrome is exposed to a temporary reduction of its RFFS capability, Annex 14, Volume I, 2.11.3, requires that: "Changes in the level of protection normally available at an aerodrome for rescue and fire fighting shall be notified to the appropriate air traffic services units and aeronautical information services units to enable those units to provide the necessary information to arriving and departing aircraft. When such a change has been corrected, the above units shall be advised accordingly."

1.2.3 In order to determine the acceptability of an aerodrome RFFS protection level, the operator should consider:

(a) *for a departure or destination aerodrome*, the difference between the aerodrome RFFS category and the aeroplane RFFS category, and the frequency of flights to that aerodrome; and

(b) *for an alternate aerodrome*, the difference between the aerodrome RFFS category and the aeroplane RFFS category, and the probability that this alternate aerodrome will be used.

1.2.4 The intention is that the operator will consider the available RFFS as one element of a risk assessment process conducted under their Safety Management System, to ensure that the overall safety of the operation can be maximized. This risk assessment would also include considerations of aerodrome facilities, availability, terrain, weather conditions etc. to ensure that the most appropriate aerodrome was selected.

Note: Annex 19 includes safety management provisions for air operators. Further guidance is contained in the Safety Management Manual (SMM) (Doc 9859).

1.2.5 The following guidance is intended to assist operators in making the assessment required by Chapter 4, 4.1.4 with due consideration of the basic principles described in 1.2.1 to 1.2.4. It is not intended that this guidance limit or regulate the operation of an aerodrome.

2. Glossary of terms

Aerodrome RFFS category. The RFFS category for a given aerodrome, as published in the appropriate Aeronautical Information Publication (AIP).

Aeroplane RFFS category. The category derived from Annex 14, Volume I, Table 9-1 for a given aeroplane type.

Temporary downgrade. RFFS category as notified, including by NOTAM, and resulting from the downgrade of the level of RFFS protection available at an aerodrome.

3. Acceptable aerodrome RFFS category

3.1 Planning

3.1.1 In principle, the published RFFS category for each of the aerodromes used for a given flight should be equal to or better than the aeroplane's RFFS category. However, if the aeroplane's RFFS category is not available at one or more of the aerodromes required to be specified in the operational flight plan, an operator should ensure that the aerodrome has a level of RFFS category which is deemed acceptable, based on a risk assessment conducted as part of the operator's safety management system (SMS). When establishing acceptable levels of RFFS category for these situations, the operator may use the criteria in Table I-1-1 and Table I-1-2. Notwithstanding these criteria, the operator may determine other acceptable levels of RFFS category in accordance with paragraph 3.1.3 of Attachment I.

3.1.1.1 Intended operations to aerodromes with RFFS categories below the levels specified in Annex 14, Volume I, Chapter 9, 9.2, should be coordinated between the aeroplane operator and the aerodrome operator.

3.1.1.2 For departure and destination aerodromes, during flight planning, the acceptable RFFS protection level should equal or exceed the values specified in Table I-1-1.

Table I-1-1. Acceptable aerodrome category for rescue and fire fighting (departure and destination aerodrome)

Aerodromes (Required to be specified in the operational flight plan) *Note: - If an individual aerodrome serves more than one purpose, the highest required category corresponding to that purpose at the time of expected use applies.*	Acceptable aerodrome RFFS category (Based on published aerodrome RFFS category, including any modification by NOTAM)

Departure and destination aerodrome	RFFS category for each aerodrome should be equal to or better than the aeroplane RFFS category. Where a suitable risk assessment has been conducted by the operator: One category below the aeroplane RFFS category or **Two** categories below the aeroplane RFFS category, in the case of a temporary downgrade of 72 hours or less but not lower than aerodrome RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.

3.1.1.3 So as to comply with the operational regulations applicable to a given flight, the operator selects alternate aerodrome(s) for various uses. During flight planning, the acceptable aerodrome RFFS category at a selected alternate aerodrome may equal or exceed the values specified as follows.

Table I-1-2. Acceptable aerodrome category for rescue and fire fighting (alternate aerodromes)

Aerodromes (Required to be specified in the operational flight plan) *Note: - If an individual aerodrome serves more than one purpose, the highest required category corresponding to that purpose at the time of expected use applies.*	Acceptable aerodrome RFFS category (Based on published aerodrome RFFS category, including any modification by NOTAM)
Take-off alternate and destination alternate aerodromes	Where a suitable risk assessment has been conducted by the operator: **Two** categories below the aeroplane RFFS category or **Three** categories below the aeroplane RFFS category in the case of a temporary downgrade of 72 hours or less but not lower than aerodrome RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.
En-route alternate aerodromes	• If at least 30 minutes notice is given to the aerodrome operator prior to the arrival of the aeroplane, a minimum of RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg, and RFFS Category 1 for other aeroplanes. • If less than 30 minutes notice can be given to the aerodrome operator prior to the arrival of the aeroplane. – **Two** categories below the aeroplane RFFS category, or – **Three** categories below the aeroplane RFFS category in the case of a temporary downgrade of 72 hours or less.

	but not lower than aerodrome RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.

3.1.2 For all-cargo operations, further reductions might be acceptable provided that the RFFS capability is adequate to arrest fire around the flight deck area long enough for the persons on board to safely evacuate the aeroplane.

3.1.3 Variations

3.1.3.1 Notwithstanding the guidance developed in 3.1.1, an aerodrome RFFS category below the protection levels defined in Table I-1-1 and I-1-2 may be acceptable if other considerations prevail, such as weather conditions, runway(s) characteristics, or length of diversion. Such variation should be based on a specific risk assessment conducted by the operator as part of its safety management system.

3.1.3.2 Variations to the aerodrome RFFS category may concern, amongst other cases:

a) an occasional flight; or

b) temporary downgrades exceeding 72 hours.

Where applicable, a variation may be used for a group of aerodromes selected for the same purpose, for a given aeroplane type.

3.1.3.3 The aforementioned variations may be based on additional or other criteria relevant to the type of operations. For instance, the 72-hour threshold for RFFS temporary downgrades may not be relevant for a single flight to or from the aerodrome concerned, such as a non-scheduled flight, whereas it is fully relevant for operations carried out on a continuous and daily basis. A variation may be time limited. A variation may also be modified to reflect the changes of the RFFS protection level available at the aerodrome(s) concerned. In accordance with Annex 6, Part I, Chapter 4, 4.1.5, the variations and their validity period should be included in the operations manual.

3.1.3.4 For variations to the acceptable RFFS category at departure and destination aerodromes, the aeroplane operator's specific safety risk assessment for an aerodrome intended to be used as a departure or destination aerodrome may be based on the following elements:

a) the frequency of flights intended by the aeroplane operator in relation to a lowered aerodrome RFFS category;

b) coordination between the aeroplane operator and the aerodrome operator (for instance, reducing intervention time by prepositioning the existing RFFS means along the runway before the intended take-off or landing).

3.1.3.5 For regular flights, the coordination should take into account the principles of Annex 14, Volume I, Chapter 9, 9.2.5 and 9.2.6 which are applicable to the aerodrome operator, as well as the possibilities to modulate the aerodrome RFFS category available on a daily cycle or seasonal cycle.

3.1.3.6 For variations in acceptable RFFS for an alternate aerodrome, the aeroplane operator's specific safety risk assessment for an aerodrome selected as a take-off alternate aerodrome, a destination alternate aerodrome or an en-route alternate aerodrome may be based on the following elements:

a) the probability of effective use of the aerodrome concerned; and

b) the frequency of selection of the aerodrome for the respective purpose of use.

3.2 In flight

3.2.1 The information contained in the operations manual according to Annex 6, Part I, Chapter 4, 4.1.5 about the aerodrome RFFS category acceptable at the planning stage (including Tables I-1-1, I-1-2 and, where usable, the variations under the specifications in 3.1.3) is applicable at the in-flight re-planning point.

3.2.2 In flight, the pilot-in-command may decide to land at an aerodrome regardless of the RFFS category if, in the pilot's judgement after due consideration of all prevailing circumstances, to do so would be safer than to divert.

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CHAPTER 4 APPENDIX D - ONE-ENGINE-INOPERATIVE FERRY FLIGHTS - 3 OR 4 ENGINED AEROPLANES

1 GENERAL

1.1 A one-engine-inoperative ferry flight should never be seen as a 'normal operation' since the margins for control and performance, especially in the approach and climb phase, can be significantly different from those associated with normal operations, and in particular, landing distance requirements. The use of such a procedure should be considered only when no reasonable alternative course of action is available and should apply only to three or four engined aircraft. Operators, therefore, must always consider and favour bringing the spares and rectification team to the aircraft to render it serviceable rather than conducting an engine inoperative ferry flight.

1.2 Companies who consider that they may need to resort to one-engine-inoperative ferry flights should set up procedures in advance of such an operation, in order to ensure that it is planned and handled in a considered manner. One-engine-inoperative ferry flights should not be considered unless the limitations, performance and operational procedures are specified in the approved Aircraft Flight Manual (AFM).

1.3 No Public Transport or Aerial Work operations are permitted for one-engine-inoperative ferry flights.

2 PROCEDURES

The following are items which should be considered, and included as instructions in the operations manuals (OM) and Engineering Instructions prepared by the operator.

(a) Procedures to ensure that all AFM and Maintenance Manual (MM) requirements are strictly adhered to.

(b) A requirement for a formal statement by a responsible engineer that the aeroplane has been prepared for an engine-inoperative ferry flight with specified minimum equipment. In making such a statement, consideration should be given to the other sources available for hydraulics, electrics, air conditioning and other essential services. For example, in the case of the BAe 146, the Auxiliary Power Unit (APU) must be serviceable to provide added hydraulic/electrical power in the event of the subsequent failure of a paired engine.

(c) The nomination of commanders and co-pilots authorised to carry out such flights; special authorisations needed from management before each flight; persons on board to be limited to nominated essential crew only.

(d) A programme specified in the Training Manual (TM) which identifies the minimum necessary training that is required before a commander or co-pilot is considered authorised. As a minimum this should include satisfactory completion of an engine-inoperative take-off and two engine out go-around procedures in a simulator approved for such training, together with pre-flight planning of such an operation. Ideally the exercise should have been practised on two separate occasions before a crew is cleared to operate one-engine-inoperative ferry flights. The required experience should, depending on the complexity of techniques involved, include one engine-inoperative techniques training, or practice in an approved flight simulator, within a period not exceeding 13 months prior to the flight. The crew should be certificated as competent by the operator.

(e) The requirements for actual and forecast weather conditions to be at least a minimum cloud base of 1000 ft agl and 2 km visibility, or as specified in the AFM for one-engine-inoperative take-off and landing procedures, whichever is the greater. A conservative maximum crosswind limit should also be applied; it is recommended to be not more than 7 kts if from the same side as the inoperative-engine, unless otherwise quoted in the AFM. One-engine inoperative ferry take-offs are permitted from a dry or wet runway unless otherwise stated in the AFM, but are not permitted from a slippery runway or from a runway contaminated by standing water, snow or slush.

(f) Consideration should be given to fuel planning requirements for flight with one-engine-inoperative, giving particular attention to consumption rates.

(g) Flight crews should be thoroughly familiar with the handling techniques to be used during take-off and the procedures to be followed in the event of a further engine or other system failure. These aspects should be fully covered during the take-off briefing. The AFM provides full details applicable to each aeroplane type, and the handling technique may vary depending upon whether the inoperative engine is inboard or outboard (4-engined types), or is centreline or non-centreline mounted (3-engined types). The procedure may specify setting rudder trim away from the inoperative engine. Generally, it will not be possible to set take-off power on an asymmetric serviceable engine from the start of the take-off run; the asymmetric thrust will need to be progressively increased as the aeroplane accelerates. It is likely that the AFM procedure will call for use of nose wheel steering, in addition to rudder, to maintain directional control initially. While the thrust setting technique is intended to ensure that the thrust asymmetry always remains within the directional control capability of the aeroplane, it is also important that the asymmetric thrust setting is not delayed so as to erode the margin allowed in the scheduling of the take-off distance.

(h) It is important that flight crews appreciate the handling and performance requirements on which the limitations for one-engine-inoperative ferry take-offs are based, as these are significantly different from normal operations. The major consideration is that the scheduled take-off distance and the handling characteristics on which the associated operating speeds are based, take no account of the possible failure of a further engine prior to the aeroplane becoming airborne. It is accepted, therefore, with such operations that a period of risk may exist during which, in the event of a further engine failure, the aeroplane can neither stop in the remaining distance available nor continue the take-off. The AFM may provide advisory data on accelerate stop distances from various stop speeds. However, such stop speeds cannot be considered as equivalent to a normal V_1 as a continued take-off capability in the event of a further engine failure above this speed is not guaranteed and the scheduled take-off distance need not take account of the accelerate stop distance. This risk period can only be eliminated totally if, at the planned take-off weight, the runway is of sufficient length that there is adequate runway remaining to permit a stop at a speed of not less than V_R. However the situation will still be influenced, one way or another, by the particular characteristics of the aeroplane type concerned and whether the second engine failure adds to or reduces the thrust asymmetry. Once the aeroplane is airborne, continued flight will be possible following the failure of a further engine, but the directional control margins and climb gradient capability will be considerably less.

(i) Operators should assess their OMs to ensure that all the points discussed in subparagraphs (g) and (h) above, and as elaborated in the particular AFM, are covered and are strictly adhered to before flight crews undertake any one-engine-inoperative ferry flights.

CHAPTER 4 APPENDIX E

ONE-ENGINE-INOPERATIVE FERRY FLIGHTS - HELICOPTERS

Cancelled – refers to CAD 360 Helicopter Supplement

CHAPTER 4 APPENDIX F - STORAGE OF DANGEROUS GOODS

1 GENERAL

1.1 The worldwide requirements for the carriage by air of Dangerous Goods (DG) are comprehensively addressed in the International Civil Aviation Organisation's 'Technical Instructions for the Safe Transportation of Dangerous Goods by Air' (ICAO TIs). By comparison, requirements for pre or post-flight storage of DG at airports are mostly the responsibility of each state's Fire Services authority; in consequence, there is no worldwide standardisation of storage requirements with the result that standards enforced by individual Fire Services vary widely.

1.2 As there have been a number of accidents or major incidents worldwide in recent years involving DG, either when in storage at airports or during carriage by air, it is important that the relevant storage and carriage requirements are clearly understood by operators and their cargo agents. Insofar as storage requirements are concerned, Hong Kong AOC holders and their agents are expected to comply with the standards set by the Hong Kong Fire Services Department (FSD) in Hong Kong or competent authorities outside Hong Kong for outstations.

1.3 The FSD's DG storage requirements can be summarised as follows for reference. However, operators should consult FSD about the latest requirements:

(a) DG should be stored in a delineated, well ventilated area, separated from non-DG cargo.

(b) The storage area should display clearly visible signs indicating 'DANGEROUS GOODS' or 'CAT 2/3/4/5* DG' or 'ICAO CLASS 1-9* DG' and 'NO SMOKING'.

* appropriate class or category

(c) The DG acceptance area should display a notice giving information about the transport of DG, as per ICAO TI.

(d) Suitable fire extinguishing equipment should be provided immediately adjacent to the DG storage area.

(e) DG items should be segregated from non-DG cargo, and certain classes / divisions of DG must be segregated from each other as required by the ICAO TI.

(f) DG items should be stored and handled in accordance with the orientation label displayed on the item.

(g) Radioactive items should be stored in accordance with local state requirements, preferably in a separate and secure Radioactive store.

(h) Cargo agent's staff should be provided with written responsibilities in respect of DG, in particular the need for careful handling at all times, and for a sound knowledge of the relevant emergency procedures.

1.4 At those airports where DG is 'accepted' for transportation, operators should ensure that adequate numbers of their own or their agent's staff hold ICAO Doc 9284 (alternatively IATA DG) Licences to provide the requisite standards of handling and supervision.

1.5 Where little DG is handled at a particular outstation, dedicated DG storage facilities need not be provided. However, in this situation, specific one-off arrangements must be made between the operator, the cargo agent and the shipper to ensure that the required procedures are followed.

CHAPTER 4 APPENDIX G –CROSS CREW QUALIFICATION (CCQ) AND MIXED FLEET FLYING (MFF)

1. General

1.1 MFF will only be considered for those aircraft types which are conducive to Cross Crew Qualification (CCQ) training, as recommended by the aircraft manufacturer.

1.2 CCQ is the process of training and testing whereby the similarities of two or more aircraft are such that substantial credit for training and testing on Type A can be credited to Type B, within the same 'Family' of aircraft operated by the same Hong Kong AOC holder.

1.2.1 The minimum experience level to commence CCQ Training Type A to Type B is as follows:

(a) Minimum four months after Aircraft Line Check on Type A, and;

(b) Minimum 200 hours on Type A, and;

(c) Minimum 20 sectors on Type A.

1.2.2 On completion of CCQ from Type A to Type B, the first take-off and landing in Type B must be completed within 21 days of completion of the box items required by the appropriate Form **DCA528**.

1.2.3 The minimum experience level on Type B prior to clearance to MFF is as follows:

(a) Minimum 50 hours on Type B or;

(b) 20 Sectors on Type B.

1.3 In order to qualify for MFF, on completion of the consolidation period on Type B, the candidate must hold a valid Proficiency Check (PC) and Aircraft Line Check on Type A at the time he/she completes the Aircraft Line Check on Type B.

1.4 **Rostering MFF Crews**

MFF crews may be rostered for the MFF qualified types within the same FDP.

1.5 **Scheduled 9 and Schedule 11 Requirements – MFF Crews**

1.5.1 **Schedule 9**

(a) On completion of the CCQ course and within 6 months of the last PC renewal on Type A, an initial PC test on Type B must be completed.

(b) Subsequent PCs must alternate, and must be conducted such that there is never more than 13 months between same Type PCs, nor less than 4 months between alternate Type PCs.

(c) Should two different Type PCs be conducted within 4 months of each other, the first of these two must be renewed no later than 6 months after the date of the second PC renewal.

(d) Should either Type PC expire, then both Type PCs are deemed to have expired, and **BOTH** must be renewed before MFF qualification is restored. Once the first PC has been renewed, the pilot may then operate that Type only until the PC for the other Type has been renewed. After both PCs have been renewed, subsequent renewals must be in accordance with sub para's (b) and (c) above.

1.5.2 **Schedule 11 – Line Check (LC)**
Requires an Exemption from AN(HK)O 1995

(a) Having completed a LC on Type B during the CCQ process, a renewal of the Type A Line Check must be completed no later than 13 months after the LC on Type B.

(b) Subsequent Line Checks must alternate, and must be conducted such that there is never more than 13 months between different Type LCs, and never more than 25 months between same Type LCs.

(c) Should either Type LC expire, then both Type LCs are deemed to have expired, and **BOTH** must be renewed before MFF qualification is restored. Once the first LC has been renewed, the pilot may then operate that Type only until the LC for the other Type has been renewed. After both have been renewed, subsequent renewals must be in accordance with sub para (b) above.

1.5.3 **Emergency Manoeuvres and Procedures**
Requires an Exemption from AN(HK)O 1995

(a) Validity is in accordance with the PC stated in para 1.5.1 above.

(b) Emergency Manoeuvres and Procedures on Type A are valid on Type B and vice versa.

1.6 **MFF Licence Procedures**

On completion of the CCQ course for aircraft Type B the completed CCQ Form DCA528, together with the pilot's licence, should be submitted to CAD Personnel Licensing Office (PLO) for the issue of a standard C of T. The C of T pages will be endorsed for both Types A and B and signed by a PLO Officer. The pilot's licence, together with the new C of T page will be returned to the said pilot. It is to be noted that the MFF C of T is not valid until the said pilot has 50 hours or 20 sectors on type B (see para 1.2.3 above).

1.7 MFF Recency Requirements

1.7.1 35 Day Recency

A pilot may not fly as a MFF Commander unless he has carried out at least one Take-off and one Landing in either aircraft Type A or B during the previous 35 day period. Revalidation may be carried out in either the simulator or aircraft.

1.7.2 3 Months Recency
Requires an Exemption from AN(HK)O 1995

A Commander or Co-pilot, to maintain the three months MFF recency, must complete a minimum of two take offs and two landings in either aircraft Type A or Type B. A minimum of one take off and one landing must then be completed in the other Type. Recency may be re-validated in a simulator approved for the purpose (see General Exemption – Recency Re-validation).

1.7.3 45 Day Recency

In addition to requirements in 1.7.1 and 1.7.2, a minimum of one take off and one landing as PF on each type every 45 days. This recency may be re-validated in a simulator approved for the purpose (see General Exemption – Recency Re-validation).

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CHAPTER 4 APPENDIX H - POLAR FLIGHT OPERATIONS

1. GENERAL

1.1 This Flight Operations Policy provides policy and guidance for operators considering conducting flight operations into and across the areas defined in paragraph 5.4 of Chapter 7 of this document.

2. PURPOSE

2.1 The purpose of this Policy is to indicate the important operational issues which are relevant to safe flight operations in designated polar areas of substantially uninhabited land where polar conditions are likely to be met and to provide guidance to operators on how to deal with these peculiarities and to ensure the safe and efficient conduct of these flights in compliance with both civil aviation regulations and aviation industry best operating practices.

3. POLICY/APPLICABILITY

3.1 This Policy is applicable to all Hong Kong AOC holders, who are planning to operate within polar areas.

4. INTRODUCTION

4.1 Commercial airlines have been flying in the north polar areas, north of the Arctic Circle, for over 50 years. The south polar areas, because of its remoteness from a large part of the populated world, has been far less travelled, but still offers the possibility of track shortening for certain flight patterns.

4.2 New routes, established across the north polar areas in the mid-90s, have given airlines the opportunity to reach destinations previously unavailable to non-stop services even using modern efficient ultra-long range aircraft.

4.3 Increasing use of these routes has instigated major improvements in areas of aviation infrastructure such as communications, air traffic control, and services supplied at remote airports, however, most of the remote alternate airports in the polar areas still fall far short of the standards of the airports in the more populous areas.

4.4 For this reason, allowances must be made to compensate for these lower standards of facilities at these airports of the polar areas to ensure the safety and security of the travelling public.

4.5 This Policy will address these important issues and offer guidance for the mitigation or elimination of these shortcomings to the world standard.

5. REFERENCES

(a) FAA Advisory Circular AC120-42B on ETOPS and Polar Operations (Chapter 6)
(b) Boeing "Aero 16- Polar Routes"
CAAS AC AOC – 98-9-1

6. DEFINITIONS AND ABBREVIATIONS

(a) AOC - Air Operator Certificate
(b) ASOA - Airport Safety and Operational Assessment (from Boeing)
(c) EDTO - Extended Diversion Time Operations
(d) ETP-Equal Time Point
(e) FMS - Flight Management System
(f) GPS - Global Positioning System
(g) HF - High Frequency Radio
(h) MEL - Minimum Equipment List
(i) PNR - Point of No Return
(j) Polar areas – As defined in paragraph 5.4 of Chapter 7 of this document
(k) QFE - the Q-code for atmospheric pressure at an aerodrome elevation (or at RWY threshold)
(l) QNH - the Q-code for altimeter sub-scale setting to obtain elevation when on the ground, i.e. altitude above MSL
(m) SATCOM - Satellite Communication
(n) SLR - Specific Long Range
(o) ULR - Ultra Long Range
(p) VHF - Very High Frequency Radio
(q) APU - Auxiliary Power Unit

7. POLAR OPERATIONS REQUIREMENTS

7.1 Proposal for a Polar Operation

7.1.1 In order for an operator to operate into the polar areas, a route study must be completed to define the operational requirements for trans-polar flights.

7.2 Specific Approval for Extended Diversion Time Operations (EDTO)

7.2.1 Operators intended to carry out operations into the polar areas must have the appropriate EDTO specific approval from CAD.

7.3 Designation of En-Route Alternate Airports

7.3.1 Apart from engine failure, an in-flight decision to divert to alternate airports could be caused by events including but not confined to:

(a) medical alerts;
(b) depressurisation;
(c) hydraulic failure; and
(d) smoke warning in cargo-hold, in-flight entertainment system or avionics.

7.3.2 An in-flight diversion within the polar areas shall take into account remoteness of the area, weather conditions as well as limited supporting facilities. In this regard the operator shall develop appropriate procedures and processes to facilitate decision-making for in-flight diversion.

7.3.3 Guidelines on medical emergencies, especially when no medical personnel are found on board, must be provided.

7.3.4 The designation of sufficient airports as en-route alternate airports for flights through the polar areas, such that one or more can reasonably be expected to be available in a variety of adverse weather conditions, to ensure an acceptable level of flight safety.

7.3.5 When selecting these en-route alternate airports, the following issues shall also be considered, on top of the EDTO requirements::

(a) Airports need to be selected for their availability and suitability to handle varying operational and personnel related situations;

(b) Several must be chosen to allow for the possibility of closures such as could occur with bad weather or airport equipment failure;

(c) Airport construction and design items such as surface Load/Pavement Classification Number (LCN/PCN) and airfield manoeuvre layout must be suitable for the aircraft type to be used. The aeroplane must be able to make a safe landing and manoeuvre off the runway at the selected en-route alternate airport. The airport must also have the capability to remove disabled aeroplane following landing, so as not to block the operation of a recovery aircraft.

(d) Airport infrastructure must allow for safe and satisfactory passenger handling during possible adverse weather conditions, including facilities for deplaning, food and water, shelter with air-conditioning, medical aid, the physiological needs of passengers and crew, transportation and communications, for the duration of the stay until safe evacuation.

7.4 Operators Plan for Passenger Recovery from En-Route Alternate Airports

7.4.1 Safe extraction of passengers and crew members must be executed and completed without any delay and within a reasonable timeframe.

Note: Operators with Exemption from AN(HK)O 1995 Article 13(2), paragraph 4(2)(b)(xiv) and Scale V of Schedule 5 shall have a reasonable and workable Recovery Plan such that passenger recovery can be satisfactorily completed within 48 hours following diversion, subject to such conditions outside the control of the operators.

7.4.2 The plan needs to address the full logistics of both passenger and crew handling, including, provisions for their complete physiological, medical and communications requirement, as well as plans for their transport from that airport onward in order to safely and expeditiously extract passengers and crew. The operator shall demonstrate this ability during the initial application and conduct an annual audit of its recovery plan for accuracy and completeness.

7.4.3 If the operator proposes to use the airplane capabilities and services as a means to satisfy all or part of the requirements for such a plan, the time-limited capability of aircraft systems shall be evaluated and taken into account.

7.4.4 After the immediate concerns are addressed, the plan shall address provisions for initiating extraction procedures for passengers, crew and the aircraft.

7.4.5 The capability to execute and complete these plans needs to be documented by the

operator, and it must be kept up to date for verification through CAD's ongoing audit program.

7.5 Operator Strategy for Fuel Freeze Monitoring and Management

7.5.1 Over flight temperatures at normal cruise altitudes through the polar areas can be measurably colder than at lower latitudes for obvious reasons. An operator needs to have in place a means to prepare for and monitor the fuel tank temperatures throughout any long flight, but especially when flying through these higher latitudes.

7.5.2 During the pre-flight preparation stage, dispatch can provide analyses of projected fuel temperatures for crew to review. There are several different formats which can be provided including waypoint by waypoint projected fuel temperatures (Fuel Temperature Prediction Program) and calculations made from measurements taken at various times during refuelling to establish on board fuel freeze points.

7.5.3 During their polar areas route training, pilots will need to be reminded of their need to have contingency plans in place in the event fuel temperature degrades more than was planned. Changes in route, altitude or Mach may be required to increase fuel temperature to safe limits.

7.5.4 Since fuel specifications may vary from state to state, operators must ensure that their planning includes reference to the appropriate specification and that operating crews are correctly informed of their fuel temperature limits for each flight. With mixed fuels in the aircraft tanks, for example, the temperature limits for the most restrictive fuel type must be observed if not allowed for in the calculation of the estimated on board fuel freeze point.

7.6 Communications and Navigation Requirements

7.6.1 With the proximity to the Magnetic North Pole, normal use of magnetic compasses is unreliable. Crews must be prepared to operate using True tracks and headings.

7.6.2 Modern long range aircraft Flight Management Systems (FMS) are designed to operate in the polar areas and cockpit displays are switched either automatically or manually upon entering the area of compass unreliability.

7.6.3 The certificate holder must have effective voice communications and/or data link capability for all portions of the flight route. The requirements of EDTO operations in these areas are stipulated in paragraph 7.6.4. For all other operations, company communications may be accomplished using HF voice, HF data link, satellite communication (SATCOM) voice or SATCOM data link. Because of the limitations of VHF and satellite-based voice communications, ATC communications will probably require high frequency (HF) voice over portions of these routes. CAD recognizes that SATCOM may not be available for short periods during flights over the Poles. Communication capability utilising HF radios may be affected during periods of solar flare activity. The Operator shall consider predicted solar flare activity and its effect on communications for each flight that is dispatched for operations into these areas.

7.6.4 For flights that are EDTO sectors of up to 180 minutes diversion time, the communications requirements of CAD 513 shall be applicable. And for EDTO sectors

operating beyond 180 minutes from en-route alternate airports, CAD would consider separately.

7.6.5 For EDTO sectors operating beyond 180 minutes from en-route alternate airports, the operator must have a second communication system in addition to that required by paragraph 7.6.3. That system must be able to provide immediate satellite-based voice communications of landline-telephone fidelity. The system must be able to communicate between the flight crew and air traffic services, and the flight crew and the operator. In determining whether such communications are available, the operator must consider potential routes and altitudes needed for diversion to en-route alternate airports.

7.6.6 Notwithstanding the requirements of paragraph 7.6.5, alternate means of communication system acceptable to CAD may be considered.

7.7 Aircraft Minimum Equipment List (MEL) Considerations

7.7.1 Before receiving authority to conduct these operations, an operator shall review its MEL for consideration of the dispatch availability of the following systems/equipment:

(a) Fuel quantity indicating system (FQIS), including the fuel tank temperature indicating system;

(b) APU (when the APU is necessary for an airplane to comply with EDTO requirements), including electrical and pneumatic supply to its designed capability;

(c) Auto-throttle system;

(d) Communication systems relied on by the flight crew to satisfy the requirement for communication capability; and

(e) Except for all-cargo operations, an expanded medical kit to include automated external defibrillator (AED).

7.8 Personnel Training in Support of Polar Operations

7.8.1 The operator shall address the following training requirements in their approved training programmes:

(a) QFE/ QNH and meter/feet conversions (required for flight crew and dispatch);
(b) Fuel freeze (training for maintenance, dispatch, and flight crew);
(c) Route-specific training on weather patterns;
(d) Relevant aircraft system limitations e.g. fuel temperature limits;
(e) Maintenance control role in providing aeroplane systems capability information to dispatch and flight crew to aid pilot-in-command in diversion decision-making;
(f) Crew training on the use of Arctic Suits;
(g) Dispatch and crew considerations during Solar flare activity; and
(h) Training of flight crew and dispatcher for their roles and responsibilities in the operator's passenger recovery plan.

7.9 Space Weather Considerations

7.9.1 Operators planning to transit the polar areas must familiarize their flight crews, dispatchers and operations controllers in the effects of Space Weather. Primarily this involves information on cosmic radiation emanating from the sun and the increased effect it has in the shallower arctic atmosphere and magnetic field. Solar flares provide the most extreme forms of this radiation, and if present to any great level, can force the re-routing or cancelation of a service.

7.9.2 The operator must ensure that there is an alerting system in place if normal thresholds are crossed for: Geomagnetic Radiation affects, Global Positioning System (GPS), Solar Radiation (affects human physiology), and Electromagnetic Radiation (affects HF communications).

7.9.3 During the course of a flight, operations control needs to monitor the radiation hazard and update crew to allow for speed, route or altitude changes as any serious radiation changes might require.

7.9.4 Managing the radiation hazard to crew and monitoring and recording the exposure levels as experienced by crew during flight. Operators are to review these regulations and ensure limits are adhered to and documentation of radiation exposure is kept.

7.10 Carriage of Special Equipment

7.10.1 When Polar Operations are expected, a minimum of two Arctic Suits (Polar / cold weather exposure suits) are to be carried, to allow outside co-ordination at en-route alternate airports.

7.10.2 Except for all-cargo operations, an expanded medical kit to include an automated external defibrillator (AED).

8. OPERATOR'S OPERATIONAL PLAN

8.1 General

8.1.1 The operational plan must be developed with reference to CAD Polar Operations Requirements and to known aviation industry information, documentation, and best practices, in order to achieve an acceptable level of safety based on both proper planning and established historical records and procedures.

8.2 Objective

8.2.1 The objective is to determine and provide the best strategies for training, pre-flight planning, in-flight operations, and operations control to ensure a safe and efficient Polar operation.

8.3 Approach

8.3.1 An operator planning to conduct Polar Operations must understand that the world's polar areas present an extremely harsh and hostile environment to be dealt with should it become necessary. With this in mind, the operator needs to take an expansive approach to reviewing all operational possibilities, and then formulate a plan for all contingencies. Programs must be in place beyond simply assuring a safe landing. Obligations to the travelling public dictate that once a safe emergency diversion and landing has occurred, there must be present, at that location, an infrastructure to support the needs of all on board the aircraft until onward travel can be assured and completed. As such it must be emphasized again that completeness of the Operational Plan for polar areas operations is imperative.

8.4 Content of the Operational Plan

8.4.1 General

8.4.1.1 The Operational Plan and associated modelling must be predicated on specific strategies that will address the various contingencies to be handled for safe and efficient operations in the harsh Polar environment as listed in CAD Polar Operations Requirements. The plan content shall include, but is not limited to:

(a) The required route and area of operation, defined and thoroughly reviewed, with all hazards, problems and special requirements identified and provided for.
(b) En-route alternate airports selected, identified, and validated for suitability.
(c) The Passenger Recovery Plan is acceptable to CAD.
(d) Fuel Freeze Monitoring and Management programs put in place, and all necessary air and ground staff trained in their use.
(e) Aircraft Communications and Navigation systems ensured as serviceable and validated for operational use.
(f) MEL considerations reviewed and prepared to meet the requirements.
(g) All relevant personnel fully trained to the requirement of their positions and relationship to the Polar Operation.
(h) Established long range requirements for crewing and rostering in place.
(i) Programs in place for the gathering, dissemination, and flight following of Space Weather data for each operating flight.
(j) Special equipment obtained and stored as required on each aircraft used for Polar Operations.
(k) Planning made well in advance with the details of the Reaction and Recovery Protocols.

8.4.2 Rostering and Scheduling

8.4.2.1 Based on the length of the flights to be accomplished, these functions must follow the currently approved format as used to crew flights for the ULR flight patterns. Similar provisions for pre-flight rest, length of layover, post flight pattern recovery times, and additional off times remain as approved for flights of this length.

8.4.3 Crew Complement, Qualifications and Training

8.4.3.1 Again related to the length of the operating pattern, crew complement will be as for the ULR operations and the same provisions will apply. Cockpit crew should have

adequate operational experience on long flights with augmented crew and familiarity with crew rest patterns en-route.

8.4.4 Cabin crew numbers will meet the minimum required by CAD, with sufficient crew carried to ensure adequate rest for the course of the flight. All the same contingencies apply as for ULR flights with regard to replacing "no-show" crew, to ensure en-route rest schedules can be met.

9. APPLICATION AND CAD CERTIFICATION PROCESS

9.1 Operator's Application

9.1.1 In order to conduct flight operations in the polar areas as defined, an operator must satisfy CAD that the proposed operation can be conducted safely.

9.1.2 The operator shall submit the following supporting documents prior to conducting polar operations:

(a) The operator's operational plan in accordance with paragraph 8 above
(b) Proposed commencement of route schedule
(c) Proposed crew rostering and scheduling procedures
(d) Proposal for operational staff training program
(e) Sample of the required navigational charts
(f) Draft operations manual reflecting the proposed operational plan

9.1.3 Sufficient lead time for consideration of the proposed operational plan must be given to CAD by the operator.

9.2 CAD Process

9.2.1 Document Review Phase:

9.2.1.1 CAD shall review the operator submitted documents, to ensure all requirements of this Appendix H are complied, and this should be a consultative process involving liaison between CAD and the operator.

9.2.2 Demonstration and Validation Phase:

9.2.2.1 Operator's Operational Plan Validation: the operator needs to include assessment of the following areas:

(a) The Passenger Recovery Plan (simulated reaction and recovery to one of the designated en-route alternates.)
(b) Flight crew and operational staff training program with a sample observation of an actual training session;
(c) Inspecting the required special equipment;
(d) Shall demonstrate the operator's ability to launch and conduct the recovery plan.

9.2.2.2 Polar Route Validation Flight: the operator needs to conduct a CAD monitored validation flight, this will audit the following areas:

(a) En-route alternate airports selected (including simulated diversion)
(b) Fuel Freeze Monitoring and Management programs, and all necessary air and ground staff trained in their use.
(c) Aircraft Communications and Navigation systems (magnetic/true/grid compass navigation issues)
(d) All relevant personnel fully trained to the requirement of their positions
(e) long range requirements for crewing, rostering and flight/cabin crew complement
(f) Special equipment obtained and stored
(g) Availability of en-route alternate airports weather information
(h) Polar weather/Space Weather (cosmic radiation issues)

10. MONITORING AND OVERSIGHT

10.1 Management Responsibility

10.1.1 Should there be any in-flight diversion to en-route alternate airports in the polar areas, the operator must ensure it has an operational plan to ensure safety, cater to physiological needs and expeditious evacuation of passenger and crew. This plan should cover but not limited to the equipment required and the configuration of the airplane.

10.1.2 The operator must conduct an annual audit of his recovery plan for accuracy and completeness.

10.1.3 The operator's management remains responsible for the monitoring and oversight of the preparation, development, implementation and operation of all flight operations into the polar areas.

10.2 Flight Operations Responsibility

10.2.1 The operator's flight operations department is responsible for the oversight and monitoring. This will include but is not limited to Space Weather and en-route alternate airports conditions and availability. Any changes affecting the flight will be dispatched to the operating aircraft by the quickest means possible.

10.3 Flight Crew Feedback and Operational Review

10.3.1 Operators operating into the polar areas are requested to obtain feedback from crews flying the routes. This will assist in identifying any further issues that should be addressed.

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CHAPTER 4 APPENDIX I - CREW BRIEFINGS

Note: Unless specified as flight crew or cabin crew, the term "crew" refers to all operational crew required on board for the air operator to support the flight.

1. General

1.1 Operators should establish crew briefings as an integral part of standard operating procedures (SOPs). Crew briefings identify and mitigate potential threats, standardize activities, ensure that a plan of action is shared by crew members and enhance crew situational awareness. Both individual and combined crew briefings for flight crew and cabin crew should be established.

2. Objectives

2.1 Crew briefings should aid crews to:

(a) identify and manage threats, and manage errors relevant to specific phases of flight;
(b) create a shared mental model of the intended operation;
(c) identify significant differences and develop a shared strategy to allow detection of deviations to standardize the operation; and
(d) refresh specific procedures or techniques if the yare relevant and expected for the ongoing operation.

Note: Without briefings, and under the pressure of time constraints and stress, retrieving information from memory may be an extremely unreliable process.

3. Principles

3.1 When establishing crew briefings, the following principles should be considered:

(a) aim to keep them as short as possible, but long enough to cover all relevant items;
(b) organize the briefing in a way such that interruptions and distractions are avoided as much as possible; and
(c) maintain a conversational, interactive style and use open-ended questions engaging all crew members to share their experiences and expectations.

Note: Crew briefings that become routine recitations do not refresh prior knowledge and are ineffective.

4. Application

4.1 Operators shall implement flight and cabin crew briefings for specific phases of operations to include actual conditions and circumstances, as well as special aspects of operations.

4.2 Flight crew briefings shall be conducted for, but not be limited to, the following phases of operations:

(a) Pre-flight;
(b) Departure; and
(c) Arrival.

4.3 Additional briefings should be conducted depending on the operational scenario:

(a) cruise briefing: required when expecting specific operational threats in cruise such as high terrain en-route or weather avoidance, or for areas with special operational rules such as the North Atlantic high level airspace (NAT HLA); and
(b) crew relief briefing: required when changing flight crew members in augmented crew operation.

4.4 Cabin crew briefings shall be conducted for, but not be limited to, the following phases of operations:

(a) Pre-flight; and
(b) First departure of the day.

4.5 Cabin crew briefings should be conducted following changes of aircraft type or crew and before flights involving a stop of more than two hours.

5. Scope

5.1 The main purpose of a crew briefing is to identify threats impending the intended operation and decide on a mitigation plan (avoidance, management) for those identified threats. The briefing should result in an agreement on the general plan of the flight trajectory and plan for significant differences to routine operation.

5.2 At the end of a crew briefing, all crew members should have a shared mental model of the intended operation, the identified threats, the mitigations and the deviations from standard operations.

5.3 Briefings should empower the pilot monitoring (PM) by setting the monitoring framework expected.

5.4 Crew briefings should complement SOPs, they should not be merely a repetition of SOP items.

6. Technique and Content

6.1 Each briefing should be initiated and managed by the pilot flying.

6.2 An effective briefing requires unique thinking, beyond the pure reflection of standard operation and routine. It should focus on the risks associated with the operational, aircraft, environmental and crew related information.

6.3 The source of the briefing material is obtained from the pre-flight preparation, aircraft operation and the knowledge and experience of all crew members engaged in the operation.

6.4 The briefing should contain the following elements:

(a) Threats;
(b) Mitigations;
(c) Operational plan;
(d) Differences from the standard operations; and
(e) A summary of key points.

Note: Abnormal procedures or techniques should only be briefed when the crew have information that makes the use of such a procedure or technique likely in order to mitigate a threat (e.g. wind shear reported in ATIS).

6.5 Threats, and the associated mitigation strategies, should be identified with regard to the:

(a) Crew factos;
(b) Aircraft;
(c) Airport and airspace including terrain; and
(d) Environment

Note: Threat and error management is a comprehensive process. A checklist-style briefing aid to identify threats is discouraged as it may lead to automatic repetition without due consideration of the real issues.

6.6 A briefing on the operational plan of the flight should make all flight crew members aware of the planned taxi and flight trajectory. This should be a high-level description and not be confused with the detailed setting and checking of the flight trajectory in the flight management system (FMS,) accomplished by the respective SOP items.

6.7 The briefing should include significant differences or deviations to routine operations and how they will be managed.

Note: Examples of significant differences could be: non-routine supplementary or special operational procedures, minimum equipment list (MEL) operational procedures, using an approach technique rarely used in routine operation and briefing of a one-engine inoperative (OEI) climb profile.

6.8 Each briefing should be concluded with a summary of key points.

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CHAPTER 5 - TRAINING AND TESTING

1 GENERAL REQUIREMENTS FOR AIRCRAFT FLIGHT CREW TRAINING AND TESTING

1.1 All training courses require CAD approval.

1.2 The statutory requirements relating to the training and periodical testing of aircraft flight crews are specified in the Air Navigation (Hong Kong) Order [AN(HK)O]. The primary purpose of this chapter is to indicate the nature of the arrangements considered necessary to secure an adequate standard of compliance and to specify those tests which form part of that compliance.

1.3 Under normal circumstances, a person administering any periodic check specified in Schedule 11 to the AN(HK)O should be currently qualified to at least the standard that the person being examined is required to demonstrate during that check.

1.4 The training and periodic tests of all crew members are required to be conducted in accordance with syllabi agreed with the Department and published in the operator's training manual. Proposed changes to syllabi or departures from training programmes must be agreed by the Department before implementation.

1.5 Operators, who wish to outsource initial, recurrent and conversion training, must ensure that CAD approves the training courses. Approved training organisations or the equivalent that have State regulatory approval, may be accepted by CAD to conduct training for Hong Kong operators, however, courses still require CAD approval. The qualification, training and approval of training and examining personnel utilised by an organisation, will normally be required to be in accordance with paragraphs 4.1 - 4.8 of this Chapter. Additional requirements for the personnel utilized by organisations approved by other States are detailed in paragraph 4.9 of this Chapter. The training provided and flight documentation used should reflect the operators' flight safety documents system.

1.6 Operators, who outsource training to training organisations that do not have formal State approval, will need to consult CAD on an individual basis to establish the approval requirements for their courses, the adequacy of training facilities, qualification requirements and approval of personnel.

2 TRAINING MANUAL

2.1 It is a statutory requirement that a training manual shall contain all such information and instructions as may be necessary to enable persons appointed by the operator to give or supervise the training, practice and periodical tests to perform their duties.

2.2 Care must be taken not to interpret 2.1 as meaning that a training manual should contain technical and operating information for general instructional purposes. Rather, it should remain concise in its purpose of giving formal expression to the operator's training policy and requirements, together with adequate guidance on these matters to instructors and examiners.

2.3 The training manual is regarded by the Department as the primary indication of the standards of training and testing likely to be achieved by the operator. One copy must be submitted to the Department, together with any later amendments or additions.

2.4 Each copy of a manual must bear a serial number and a distribution list must be held by a person responsible for issuing amendments. Each volume of the manual must be numbered, bear a title and a list of contents giving a clear indication of its scope. The title of the person or department responsible for the issue of the manual must also be included. At the front of each volume there must be an amendment page to record amendment number, date of incorporation, signature of person amending and page(s) or paragraph(s) affected. The numbering of pages, sections, paragraphs etc should be orderly and systematic so as to facilitate immediate identification of any part of the subject matter. The standard of printing, duplication, binding, section dividers, indexing of sections etc should be of sufficient quality to enable the document to be read without difficulty and to ensure that it remains intact and legible during normal use.

2.5 The amendment of a manual in manuscript is not acceptable. Changes or additions, however slight, must be incorporated by the issue of a fresh or additional page which must be dated and on which the new or additional material is clearly marked. It is therefore recommended that items likely to be the subject of frequent change, such as lists of appointments, are shown on pages that do not include more permanent text.

2.6 Although the training manual is part of the general operations manual, it should be a separate document addressed to the training staff, each of whom should have a personal copy. The form that the manual takes will vary considerably according to the size and complexity of the operator's organisation and the aircraft used; its adequacy will be assessed solely on the basis of its suitability for the operator's particular needs and circumstances. It is therefore important that all training staff are aware of the need to keep the document under review and ensure that it accurately reflects the operator's circumstances at the time.

2.7 In addition to the more general matters of policy, the following in particular must be included in the manual:

(a) operator's requirements in respect of qualifications, training and experience of training staff;

(b) the name and title of the person ultimately responsible for flight crew training and testing and lines of reporting to and from that person's post;

(c) a comprehensive statement of the duties and responsibilities of all training staff, which should include their names, the type of training and/or testing which they may conduct and the types of aircraft on which they are authorised;

(d) minimum standards of experience and qualification, and of initial and periodical training to be met by all aircraft flight crews for each type of aircraft used by the operator;

(e) detailed syllabi for both ground and flying training and specimen record forms in respect of all training and tests; the minimum hours/sectors necessary to meet flight training requirements;

(f) a list of the required competency tests and their frequency;

(g) arrangements for administering and recording the periodical tests of all flight crew;

(h) limitations on flying more than one type or variant;

(i) policy with regard to crewing together of crew members under training;

(j) training of pilots to act as relief crew occupying other than their normal crew positions;

(k) syllabus covering training requirements for promotion of co-pilot to Captain;

(l) checking of pilots in handling and non-handling pilot duties;

(m) chain of command in an emergency, when training captain not occupying a pilot's seat;

(n) methods of simulating instrument flight conditions; methods of simulating engine failure and the form of words to be used;

(o) practice of abandoned take-off during training flights, normally a restriction to speeds not in excess of 50% of V_1;

(p) procedures for touch-and-go or stop-go landings with particular emphasis on division of duties, considerations of flap settings, runway length, brake cooling and terrain;

(q) syllabus covering engineering perspectives including MEL/CDL, technical log, airworthiness defects;

(r) proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by power plant, airframe or systems malfunctions, fire or other abnormalities.

(s) instructions and guidance on how Predictive and Low Level Windshear initial and recurrent training should be conducted, with emphasis on the positive action required to minimise the effect of these conditions if encountered during take-off, on the approach and landing. Advice must also be given on the avoidance of these conditions;

(t) limitations on training and testing in the course of flights for the purpose of public transport. Note particularly that the simulation of instrument flight conditions and of emergencies affecting the flight characteristics of the aircraft is prohibited in the course of flights for the public transport of passengers;

(u) instructions covering retesting and retraining after unsatisfactory performance or periods of non flying due to illness or other causes;

(v) the use of full flight simulators, other training devices and copies of Approval documents held;

(w) special equipment training: FMS, INS, E/GPWS, ACAS, HUD/EVS, etc.;

(x) Human Factors (HF) and Crew Resource Management (CRM) training;

(y) Safety Management System training;

(z) instructions and procedures covering pilot incapacitation and the roles of all crew members;

(aa) aviation security training;

(bb) the carriage of dangerous goods in accordance with the current edition of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air Doc 9284; and

(cc) prevention of runway incursion in accordance with the current edition of the ICAO Manual on the Prevention of Runway Incursions (Doc 9870).

(dd) upset prevention and recovery training in accordance with the current edition of the ICAO Procedures for Air Navigation Services – Training (PANS-TRG, Doc 9868) and Manual on Aeroplane Upset Prevention and Recovery (Doc 10011). Further guidance and requirements can be found in Appendix G of this Chapter.

3 TRAINING AND TESTING STAFF

3.1 A person, whose qualifications and experience are agreed by the Department to be suitable, must be designated to take general and overall charge of arrangements for the training and testing of aircraft flight crews. This person's name, authority, responsibilities and reporting routes must be clearly defined in the operations manual.

3.2 Under the control of the person in charge of training, the operator will need to appoint examiners and instructors to conduct periodical tests and give the practical training, as necessary, to satisfy the requirements of the AN(HK)O. The number of training staff employed is expected to be consistent with the operator's task and their qualifications and experience are expected to reflect the role and types of aircraft used.

3.3 It is important that examiners and instructors are experienced and qualified for their task, and operators are to ensure that they are adequately trained in teaching and examining techniques. Where it is intended that they will carry out tests required under Schedules 9 and/or 11 of the AN(HK)O in an approved flight simulator, they themselves must be duly approved by the Department for that purpose.

3.4 Exceptionally, operators may need to use the services of manufacturers' pilots or those from foreign operators for flight training, testing and route Line Flying Under Supervision (LFUS). Such training staff must be familiar with the operations manual and the training manual of the operator to whom they are temporarily attached. The operator must obtain certified copies of duty and rest period records for the 28 days prior to the crew members being rostered for duty; appropriate flight/duty records must be maintained for the period that the crews are assigned to the operator. As a general rule, a Hong Kong licence or a temporary validation of a foreign licence will have to be obtained. The operator should contact the CAD Personnel Licensing Office to obtain the necessary Certificate of Validation for the foreign pilots. The Department will specify requirements in individual cases. When such pilots are used for training they must be properly licensed and authorised to conduct initial type ratings, instrument rating renewals and competency checks. To conduct LFUS, pilots are required to hold full company command qualification for public transport flights and to meet all Schedule 11 competency check requirements.

4 TRAINING AND EXAMINING STAFF QUALIFICATIONS

4.1 Schedule 9 (Flight Crew Licences)

4.1.1 Flight tests for the initial issue or renewal of Aircraft Ratings and renewal of Instrument Ratings may only be conducted by examiners so authorised by the Director-General of Civil Aviation. Applicants for appointment as Authorised Examiners (AE) must be sponsored by their employer. Any authority becomes automatically invalid the moment the examiner leaves the sponsor's employment.

4.1.2 The applicant for appointment as an AE for aeroplanes shall hold an appropriate licence and ratings and a valid medical certificate. As a general guideline, the applicant is expected to have a minimum of 2,000 hours flight time as a pilot of multi-engined aeroplanes and has achieved high standards in flying ability as evidenced by at least two Proficiency Checks being separated by an interval of not less than 4 months with his current employer sponsoring his AE application. An applicant for AE for helicopters is expected to have at least 500 hours as the pilot-in-command and at least 250 hours as a flight instructor/training captain.

4.1.3 Prior to granting authorised status as an Instrument Rating Examiner (IRE) and/or a Type Rating Examiner (TRE), the Department must be satisfied that the applicant is a fit person to hold the authorisation and qualified to do so by reason of his knowledge, experience, competence and skill.

4.1.4 In assessing the above criteria the applicant's previous conduct will be taken into consideration. The applicant must meet certain experience levels, have completed the CAD Authorised Examiner's Course (CAD AE course) and have satisfactorily conducted a test whilst observed by an Inspector.

4.1.5 The CAD AE course is undertaken using facilities provided by approved Hong Kong operators. It consists of briefings, facilitation and de-briefings utilising English as conversational as well as aviation technical language. Therefore applicants, in addition to meeting the high standards referred to in the above paragraphs, should also have attained the requisite language skills in order to ensure a successful course outcome.

4.1.6 The AEs who have previously successfully completed the CAD AE course and who have not exercised the privileges of their authority within the preceding five years will be required to attend the full CAD AE course again prior to being considered for reappointment.

4.1.7 A TRE (simulator) must be qualified on type under the provisions of the AN(HK)O. His ability to perform the functions while occupying the co-pilot's seat must be checked and recorded by the operator.

4.1.8 An examiner's authority will normally be valid for three years subject to CAD's assessment on the applicant. The tests that an AE is authorised to conduct are stipulated on the Letter of Authority (LoA) granted by CAD. The AE must ensure that he exercises the privileges in accordance with the LoA at all times.

4.1.9 An Inspector or a person properly delegated by the Director-General of Civil Aviation will renew an examiner's authority at the appropriate period. In the event that a satisfactory standard is not achieved, then the examiner's authority will be revoked by the CAD. Further assessment for re-appointment may be made after further training, agreed between his company and HK CAD, has been undertaken.

4.1.10 All applications for appointment as an AE must include the following particulars:

(a) full name;

(b) licence type, number and expiry date;

(c) aircraft types endorsed in Part 1 of the licence;

(d) date of last Certificate of Test (Aircraft Rating) for aircraft type to which the application relates, and whether annotated P1, P2 or E1;

(e) date of last Certificate of Test (Instrument Rating) and type of aircraft on which tested;

(f) date of last medical;

(g) total hours P1 or E1 - all types;

(h) total hours P1 or E1 - in previous 12 months on type to which the application relates;

(i) total hours PI or E1 - all turbo-jet aircraft, if application relates to a turbo-jet aircraft;

(j) total hours P1 or E1 - all turbo-prop aircraft, if application relates to turbo-prop aircraft;

(k) details and result of any courses in instructional or examining techniques undertaken;

(l) details, with supporting documentation, of any examining authority held, or previously held, from any other regulatory authority;

(m) any other relevant information.

4.1.11 In case of an applicant for appointment as a TRE/IRE (Simulator Only), and his Class 1 medical certificate could not be obtained, the following requirements in addition to paragraph 4.1.10 shall be met:-

(a) A nomination from the employer, ie, an AOC Holder, signifying that the nominee is considered by the company as competence and suitable for examiner duties in the simulator;

(b) A minimum of 6 consecutive years' experience as a Hong Kong TRE/IRE, with his Proficiency Check (PC) on the nominated aircraft type not expired for more than 24 months, and without any complaints or CAD actions against him during his appointment as an AE;

(c) A letter from an Approved Medical Examiner (AME) is required to prove the TRE/IRE's fitness to perform his examiner duties in the simulator;

(d) This TRE/IRE (Simulator only) is required to undergo the same Recurrent Training/Proficiency Check (RT/PC) and Safety and Emergency Procedures (SEP)/Security/CRM training/testing for pilots. All these training and testing

events have to be properly recorded within the company's training records system. The Certificate of Tests of this TRE/IRE (Simulator only) are not to be signed. In addition, this TRE/IRE (Simulator only) must not carry out any examiner duties if he fails his own RT/PC or other regulatory/company-required training/tests; and

(e) The TRE/IRE will be required to complete at least 2 line observation flights and conduct at least 4 PCs in a simulator every 6 months.

[Note: Within an AOC holder,
(i) The number of TRE/IRE (Simulator Only) without Class 1 medical certificate is restricted to 20% of total number of TRE/IRE within the specific aircraft type.
(ii) Only one renewal of authorization is permissible during the appointment of this special type of TRE/IRE (Simulator only); and
(iii) Transfer to another aircraft type, for the TRE/IRE (Simulator Only) without Class 1 medical certificate, is not permissible.
(iv) TRE/IRE (Simulator only) without class 1 medical certificate will not normally be authorised to conduct Simulator Base Training (SBT).]

4.2 Schedule 11 (Public Transport)

4.2.1 An operator is responsible for ensuring that all persons have the training, experience and practice and have undergone the periodical tests specified in Part B of Schedule 11 to the AN(HK)O, before acting as crew members on any flight for the purpose of public transport.

4.2.2 In practice, the Schedule 9 tests for renewal of Instrument and Aircraft Ratings are integrated within the operator's bi-annual competency checks (proficiency checks). Operators are therefore required to train and subsequently appoint pilots from within the Company as AEs and Approved Persons (Simulator Instructors). The following appointment and subsequent career progression is therefore recommended for training and check personnel:

(a) Line Training Captain

(b) Type Rating Instructor – Simulator (TRI – Simulator)

(c) Type Rating Examiner/Instrument Rating Examiner - Simulator Only [TRE/IRE - Simulator Only (Exclude SBT]

(d) Type Rating Examiner/Instrument Rating Examiner - Simulator Only (Include SBT) [TRE/IRE – Simulator Only (Include SBT)]

(e) Type Rating Examiner/Instrument Rating Examiner – Aircraft and Simulator (TRE/IRE – Aircraft and Simulator)

4.3 Line Training Captain

4.3.1 The role of the line training captain is vitally important in a balanced training regime. Much of the responsibility for the standardisation of operating procedures and for sound flight deck management will depend on the observations and analytical skills of the line training captains. The importance of line training and testing cannot be over emphasised and the calibre of the staff should reflect this. Specific responsibilities may include sectors operated under supervision following type conversion, final line

checks, annual line checks and renewal of Captain's 35 day recency.

4.3.2 A line training captain shall hold an appropriate licence and ratings and a valid medical certificate. As a general guideline, a line training captain is expected to have a minimum of 2,000 hours flight time as a pilot of multi-engined aeroplanes or as a helicopter pilot, of which at least 500 hours as the pilot-in-command and completed training specified in the company manual for the appointment.

4.4 **TRI – Simulator**

4.4.1 The duties of a "TRI – Simulator" include the conduct of simulator training exercises during initial type conversion including low visibility operations. They may also include Schedule 11 bi-annual competency and instrument approach-to-land (including low visibility operations) tests, and renewal of three monthly recency in simulators approved for that purpose.

4.4.2 Prior to appointment, a "TRI – Simulator" must complete an approved course in instructional techniques, and also induction training in his duties. He is to be observed by an Inspector while conducting Schedule 11 items prior to appointment as an Approved Person, and again on renewal. However the renewal of this appointment may be delegated to a company AE, in which case the airline is to advise the Department when the renewal is complete so that a renewed certificate can be issued.

4.5 **TRE/IRE - Simulator Only (Exclude SBT)**

4.5.1 Persons nominated to be "TRE/IRE - Simulator Only (Exclude SBT)" must complete an approved course in instructional and examining techniques, and also induction training in their duties. They will then be observed by an Inspector while conducting simulator tests for Schedule 9 and Schedule 11 ratings prior to appointment as Authorised Examiners (Simulator). However the "TRE/IRE – Simulator Only (Exclude SBT)" may not conduct SBT.

4.6 **TRE/IRE – Simulator Only (Include SBT)**

4.6.1 Persons nominated to be "TRE/IRE – Simulator Only (Include SBT)" must complete induction training in their duties. For the initial appointment as a "TRE/IRE – Simulator Only (Include SBT)" and on each subsequent type change, they must be observed by an Inspector while conducting Base Training (BT) in the simulator for the appointment as "TRE/IRE – Simulator Only (Include SBT)" for that type. The Inspector will observe the TRE operating from both control seats.

4.7 **TRE/IRE - Aircraft and Simulator**

4.7.1 Persons nominated to be "TRE/IRE – Aircraft and Simulator" must complete induction training in their duties. For the initial appointment as a "TRE/IRE – Aircraft and Simulator" and on each subsequent type change, they must be observed by an Inspector while conducting tests in an aircraft for the issue of aircraft ratings prior to appointment as Authorised Examiners (Aircraft) for that type. The Inspector will observe the TRE operating from both control seats. However when the TRE subsequently endorses on an additional family type with the same number of power plants i.e. A320/A330, then the aircraft check may be completed from either control seat. The authority to conduct tests by the "TRE/IRE – Aircraft and Simulator" also includes SBT and Aircraft Base Training (ABT).

4.7.2 AEs who fly two aircraft types that are classified for mixed fleet flying (MFF), will be

observed on each type for initial CAD authorisation. Subsequent AE renewal may be undertaken on either type and will be valid for both, provided the AE maintains recency on both types.

4.8 Validity of Appointments and Recency Requirements

4.8.1 Validity of appointments

TRE/IREs and Approved Persons will normally be appointed by the Department for a maximum period of 3 years, and normally a shorter period for those employed by training organisations and manufacturers based outside of Hong Kong. Both may be subject to review at more frequent intervals by the Department and additional requirements under paragraph 4.9 of this Chapter. Operators are responsible for ensuring that the competence of training staff appointed by them to discharge the operator's responsibilities under Schedule 11 of the AN(HK)O is kept under regular review.

4.8.2 Recency Requirements

An AE is required during each and every 12-months period to conduct the following minimum number of aircraft/simulator details, in order to retain validity:

(a) TRE/IRE – Simulator Only (Exclude SBT)
Four separate simulator sessions, which include Instrument Rating Renewal (IRR)/Aircraft Rating Renewal (ARR) or Aircraft Rating (AR) tests during each session. In the case of TRE/IRE – Simulator Only (Exclude SBT) without current class one medical certificate, refer to CAD 360 Air Operator's Certificates Requirements Document, Chapter 5 Section 4, paragraph 4.1.11.

(b) TRE/IRE – Simulator Only (Include SBT)
Four separate simulator sessions, two of which will consist of Zero Flight Time (ZFT) training and testing and two separate simulator sessions, which include AR and/or Instrument Rating (IR) test.

(c) TRE/IRE – Aircraft and Simulator
A minimum of two Base Training sessions, one of which may be a simulator ZFT session and a minimum of two simulator sessions that include tests for IRR/ARR or initial AR tests.

Note: An AE who has not met the minimum requirements must report the circumstances to the CAD so that the continued validity of his appointment can be considered. The TRE/IRE may then be advised of any recency revalidation requirements and/or the reissue of the LoA. Failure to make such a report may invalidate subsequent tests.

4.8.3 Waivers may be given by the Department to the instructional and examining techniques requirements for nominees with acceptable previous experience and qualifications. On conversion to a new type, TRE/IREs must normally complete the induction training and observation requirements specified in paragraphs 4.6 and 4.7.

4.9 Training Organisation Approved by a Foreign National Aviation Authority (NAA)

4.9.1 This paragraph must be read in conjunction with paragraph 1.5 of this Chapter, which contains the general requirements for an operator to outsource the training to a training organisation or manufacturer.

4.9.2 In general, personnel utilised by a training organisation or manufacturer acceptable to CAD will normally be required to meet the qualification, training, approval and validity requirements listed in the paragraphs 4.1 - 4.8. For personnel utilised by a foreign approved training organisation, certain differences to qualification and validity requirements are listed below.

(a) An examiner from an organisation nominated by an operator for appointment as an AE will require authorisation by CAD. This examiner shall possess a valid examiner approval issued by a foreign NAA acceptable to CAD. An authorisation will have a validity to be determined by CAD which may be shorter than 3 years from the month of appointment or renewal. Operators are reminded that they must submit a request for the appointment of an AE in accordance with paragraph 4.1.10.

(b) For an operator who has obtained CAD's approval to use a foreign approved organisation for recurrent training and checking and has obtained CAD's agreement to undertake bi-annual testing in aircraft, appointment of AEs for "TRE (aircraft only)" or "TRE/IRE (aircraft only)" may be considered. Their qualification, training, appointment requirements must be agreed with the assigned Inspector. Their recency requirements are as follows :-

(i) TRE – Aircraft Only

Two separate aircraft training sessions of which at least one must include a test for a Hong Kong licence rating.

(ii) TRE/IRE – Aircraft Only

Two separate aircraft training sessions, one or both of which include an IRR/ARR or AR test.

The authority for the above AE will be considered case-by-case.

(c) TRI – Simulator. A TRI employed by an **approved** organisation outside Hong Kong, may be qualified to conduct simulator training without the necessity of formal CAD approval.

(d) A TRI required to conduct tests in accordance with AN(HK)O Schedule 11, will need CAD approval.

(e) Personnel used for Safety and Emergency Procedure (SEP) training will require CAD approval if required by the operator to conduct AN(HK)O Schedule 11 tests.

4.9.3 *Course Completion Certificate.* Upon completion of any outsourced training, an operator must obtain a certificate from the contractor, confirming that the ground and/or simulator training course has been completed to the satisfaction of the approved organisation.

5 SUPERVISION OF EXAMINERS

The procedures to be followed and standards to be applied by AEs are set out in CAD 170 "Authorised Examiners Handbook". Inspectors will observe the conduct of tests by AEs, and of crew training generally, during the currency of an Air Operator's Certificate. The purpose of these inspections is to ensure that training and testing is in compliance with the operator's training manual and within the terms and conditions of the appointment of CAD AEs.

6 PROBLEMS OF SMALL OPERATORS

The arrangements discussed in the foregoing paragraphs may not be practicable in the case of a very small organisation operating one or two aircraft and employing a small number of aircraft flight crews. In larger organisations employing several pilot examiners, one can test the other and there is no real difficulty. However, where the total complement of pilots warrants only one examiner, arrangements should be made for his periodical tests to be conducted by an independent examiner outside the operator's organisation; in such cases the Department should be notified. The Department will then assess the suitability of the nominated independent examiner and, if acceptable, make arrangements for the issue of the appropriate LoA. Once the identity of the independent examiner has been agreed upon, the operator must send a letter of agreement to the Department covering the arrangement made.

7 PART TIME AND 'FREELANCE' CREW MEMBERS

7.1 Operators should ensure the competence of any part-time or 'free-lance' pilots they employ. Schedule 11 tests carried out to establish the competence of an operator's pilots, must be conducted either by the operator himself or by another operator, under arrangements detailed in the company's training manual and agreed by the Department, which ensure that the pilot is competent to perform all the duties and responsibilities laid upon him by the operator.

7.2 Additionally, the operator must satisfy himself that the flight crew member is fully conversant with the company's operations manual and flight procedures. In the case of Captains, route competency must also be established and certified. In all cases, flight and cabin crew must be tested as to their knowledge of emergency/survival drills and equipment. Operators must obtain certified copies of duty and rest period records for the 28 day period prior to the rostering of the crew members concerned, and appropriate flying duty records must be maintained for the period that the operator employs such crews.

8 OPERATION ON MORE THAN ONE TYPE OR VARIANT

(See Appendix B to Chapter 5)

8.1 **Aeroplanes**

(a) An operator shall ensure that a flight crew member does not operate on more than one type or variant, unless the flight crew member is competent to do so.

(b) When considering operations of more than one type or variant, an operator shall ensure that the differences and/or similarities of the aeroplanes concerned justify such operations, taking account of the following:

(i) The level of technology;

(ii) Operational procedures;

(iii) Handling characteristics.

(c) An operator shall ensure that a flight crew member operating more than one type or variant complies with all of the requirements prescribed in Schedules 9 and 11 for each type or variant unless the Department has approved the use of credit(s) related to the training, checking and recency requirements.

(d) An operator shall specify appropriate procedures and/or operational restrictions, approved by the Department, in the operations manual, for any operation on more than one type or variant covering:

(i) The flight crew members' minimum experience level;

(ii) The minimum experience level on one type or variant before beginning training for and operation of another type or variant;

(iii) The process whereby flight crew qualified on one type or variant will be trained and qualified on another type or variant; and

(iv) All applicable recency requirements for each type or variant.

8.2 **Helicopters and Aeroplanes**

(a) When a flight crew member operates both helicopters and aeroplanes:

(i) An operator shall ensure that operations of helicopter and aeroplane are limited to one type of each.

(ii) The operator shall specify appropriate procedures and/or operational restrictions, approved by the Department, in the operations manual.

8.3 **Cross Crew Qualified**

If a flight crew member is to qualify on a type which is similar to a type on which he is currently qualified, his conversion training to the second type may be suitably abbreviated, subject to agreement with the Department. The crew member is then 'Cross Crew Qualified (CCQ)'. Details of the agreed abbreviated training course, and subsequent recurrent training, are to be specified in the operations manual.

8.4 **Mixed Fleet Flying**

A flight crew member who is Cross Crew Qualified may be allowed to operate both types ('Mixed Fleet Flying' or 'MFF') subject to agreement with the Department. Details of the agreed recency and recurrent training and testing requirements to enable the crew member to operate both types are to be specified in the operations manual.

9 RECURRENT TRAINING AND CHECKING

9.1 General

9.1.1 Line checks, route and aerodrome competency and recent experience requirements are intended to ensure the crew member's ability to operate efficiently under normal conditions, whereas other checks and Safety and Emergency Procedures (SEP) training are primarily intended to prepare the crew member for abnormal/emergency procedures.

9.1.2 The line check is normally performed in the aircraft. All other training and checking should be performed in the aircraft or an approved flight simulator or, in the case of the SEP training, in a representative training device. The type of equipment used for training and checking should be representative of the instrumentation, equipment and layout of the aircraft type operated by the flight crew member.

9.1.3 The line check is considered a particularly important factor in the development, maintenance and refinement of high operating standards, and can provide the operator with a valuable indication of the usefulness of his training policy and methods. Line checks are a test of a flight crew member's ability to perform a complete line operation satisfactorily, including pre-flight, taxi operations and active runway identification, and post- flight procedures and use of the equipment provided, and an opportunity for an overall assessment of his ability to perform the duties required as specified in the operations manual. The route chosen should be such as to give adequate representation of the scope of a pilot's normal operations. When weather conditions preclude a manual landing, an automatic landing is acceptable. The line check is not intended to determine competence on any particular route.

9.1.4 In addition to the above duties, flight crew members should be assessed on their crew resource management skills. The Captain, or co-pilot acting as the Captain, should also demonstrate his ability to "manage" the operation and take appropriate command decisions. When assessing crew resource management skills, the examiner should occupy an observer's seat.

9.1.5 When a flight simulator is used for proficiency training and checking, the opportunity should be taken, where possible, to use Line Orientated Flight Training (LOFT).

9.1.6 The SEP training should, as far as is practicable, take place in conjunction with cabin crew undergoing similar training, with emphasis on co-ordinated procedures and two-way communication between the flight deck and the cabin.

9.2 Periodic Competency Tests

9.2.1 The following is a full list of periodic competency training and tests which cover all Schedule 9 and 11 requirements, the results of which must be recorded on operators' forms:

(a) proficiency check (includes the aircraft Rating and Instrument Rating);

(b) line check;

(c) instrument approach-to-land proficiency check, including low visibility operations procedures where applicable;

(d) Captain's route and aerodrome competence;

(e) handling recency;

(f) Safety and Emergency Procedures (SEP);

(g) Crew Resource Management (CRM) training.

9.3 **Proficiency Check (PC)**

9.3.1 Although the PC is a test, it provides an opportunity for exercising emergency drills which rarely arise in normal operations. The statutory Schedule 9 requirement is that pilots are tested and their competence be verified and certified. The PC is undertaken in an approved flight simulator and shall include testing of the Aircraft Rating (AR) and Instrument Rating (IR) (Schedule 9) together with relevant Schedule 11 items including the Instrument Approach to Land (IAL). Both Certificates of Test for the aforementioned Schedule 9 items shall be signed on satisfactory completion of the PC. When a simulator is not available, the operator should propose to CAD a system for completing the PC. However, it is CAD policy that in this event, a flight simulator should be used for each alternating PC. An example PC form is included in Appendix E.

9.3.2 **PC – Initial.** Prior to commencing public transport Line Flying Under Supervision (LFUS), the operator must be assured that a pilot is competent and has reached the required standards during his conversion course. Therefore, there must be a valid PC form included within the pilots training file. The senior management signed competency statement on the PC form is the culmination of a pilot's conversion training and is verification that the type technical ground phase, simulator phase and the aircraft Base Training if applicable have been completed satisfactorily and tested accordingly. It is confirmation that training has been undertaken during the conversion for all Schedule 11 items as listed below in 9.3.5 (b) and that the pilot has demonstrated competence in the use of all IAL systems that could be encountered either at destination or alternate airports. In particular, if circling approach procedures are approved for use, then these must be covered and competence demonstrated during the conversion. In the case of pilots who are required to be qualified in both control seats, they must demonstrate competence in both seats (Form DCA528 boxed items).

9.3.3 **PC – Recurrent.** The recurrent PC is required for the testing of Schedule 9 and Schedule 11 items within the relevant period. Because the items listed in paragraph (b) below may be undertaken over a three year period, operators should structure the PC with a defined program of six PCs over a three year period. The "structured" PC can result in more efficient use of simulator time. For example, with agreement with the assigned Inspector, practice of LVO failures and reversions may be spread over the three year period. The Aircraft Rating Renewal (ARR) is normally a manually flown exercise however, in one or two of the six PCs it should be undertaken making maximum use of the aircraft automation in accordance with company SOP. The AN(HK)O requires that a pilot is tested for the types of instrument approaches to be used at destination or alternate airfields. The IAL tests for VOR/DME, LOC only, ILS BB, ADF, GPS and circling approaches can be covered over the three year period. However, if an operator's route structure involves operations to airfields where it is likely that circling approaches will be required, it is CAD policy that they shall be tested on at least three occasions during the three year PC cycle. On satisfactory completion of the PC, senior management must sign the competency certificate accordingly.

9.3.4 The avoidance of Controlled Flight into Terrain (CFIT) must be briefed and considered throughout each PC. The crew's situational awareness and recognition of their responsibility for terrain clearance despite conflicting ATC instructions must be emphasized during both the departure and arrival phases of the flight. The additional threats imposed by non-precision approaches must be covered.

9.3.5 The scope of the practice and check may be divided into three categories, as follows:

(a) Emergency manoeuvres in Instrument Meteorological Conditions (IMC) which must be carried out on each bi-annual check:

(i) a take-off with engine failure between V_1 and V_2 or as soon as safety considerations permit. When the check is carried out in an aircraft, instrument flight conditions should be simulated as soon as possible after becoming airborne;

(ii) a precision instrument approach to minima with one engine inoperative, followed by a missed approach;

(iii) landing with one engine inoperative. For single-engined aeroplanes a practice forced landing is required;

(iv) where the emergency drills require action by the non-handling pilot, the check must also cover knowledge of such drills.

Note: When engine out manoeuvres are carried out in an aeroplane, the engine failure must be simulated.

(b) Selected items from the following list should be covered on each PC, ensuring that all items are covered and recorded at least once within a three year period:

(i) A rejected take-off (initiated at a speed no greater than 50% of V_1 when conducted in an aircraft);

(ii) engine fire;

(iii) engine or propeller overspeed;

(iv) fuselage fire (pilot operated extinguishing system);

(v) emergency operation of landing gear and flap;

(vi) pressurisation failure;

(vii) fuel jettison;

(viii) low fuel contents;

(ix) engine relight/restart;

(x) hydraulic failures;

(xi) electrical failures;

(xii) engine and engine control malfunction;

(xiii) action following E/GPWS and TCAS warnings;

(xiv) action following predictive and windshear warnings;

(xv) pilot incapacitation - to be carried out annually;

(xvi) approach and landing with flying control or flight director system inoperative;

(xvii) circling approaches;

(xviii) wrong runway scenario; and

(xix) upset prevention and recovery. Further guidance and requirements can be found in Appendix G of this Chapter.

Note 1: Some of the above items will need to be carried out by 'touch drills' and, if the check is carried out in an aircraft (rather than a simulator), they are normally best attended to on the ground.

Note 2: ACAS training for flight crew shall be established in accordance with ICAO Doc 8168 Part III Section 3 Chapter 3 and Attachment A.

Note 3: Subject to CAD acceptance, the above practice and check items may be modified if considered more compatible with the operator's operational and training needs as assessed via an Evidence-based Training (EBT) or Competency-based Training and Assessment (CBTA) programme (refer to para. 9.3.6 of this Chapter).

(c) A supplementary questionnaire on technical matters and operating procedures which, although not falling within the category of emergencies, are matters on which pilots should be tested at regular intervals. Typical items to be covered include:

(i) recognition and diagnosis of aircraft system faults for which there are no set drills;

(ii) radio failure procedures;

(iii) use of operations manuals, including Aerad/Jeppesen route guides;

(iv) familiarity with latest operations manual amendments, information circulars and aircrew instructions;

(v) loading instructions;

(vi) knowledge of internal and external checklists;

(vii) aircraft equipment such as Flight Management System (FMS), navigation systems, E/GPWS, flight directors, weather radar etc;

(viii) noise abatement procedures;

(ix) precautions for winter operations, anti-icing procedures and operations from contaminated runways;

(x) engine failure during stages of flight other than on take-off, especially critical phases such as noise abatement, a Standard Instrument Departure (SID) or over high ground or on approach;

(xi) wind shear recognition and avoidance.

NOTE: On most of the larger modern aircraft the list of items that might usefully be discussed is likely to be extensive and operators may prefer to deal with only a selection of items on a particular PC. In this event, a plan of items to be covered should be drawn up to ensure that all are dealt with over a three year period and records should be maintained accordingly. Some items may

equally well be covered in the course of the line check. Advantage should also be taken of the opportunity to give pilots experience in the simulator of such rare occurrences as windshear, flapless landings and all engines out landings.

9.3.6 **Evidence-based Training (EBT) / Competency-based Training and Assessment (CBTA)**

9.3.6.1 ICAO Doc 9995 (Manual of Evidence-based Training) provides guidelines for baseline and enhanced EBT implementation, whereas ICAO Doc 9868 (Training) provides guidance on applying CBTA. Operators who wish to apply for EBT or CBTA implementation approval should contact the assigned Inspector with a programme proposal and assessment commensurate to operational and training needs. CAD may consider the approval on a case by case basis.

9.3.7 **Training Records**

9.3.7.1 An operator must ensure that flight crew are properly trained and tested in accordance with Schedules 9 and 11 of the AN(HK)O 1995. It is therefore essential that proper, accurate and relevant records are kept of a pilot's initial training and testing.

9.3.7.2 The training records must be kept in the pilot's training file and securely retained in the operator's training department.

9.3.7.3 Prior to operating a public transport flight, and commencement of LFUS, the records must show that a pilot has satisfactorily completed the appropriate approved ground and flight simulator course and if applicable aircraft base training. It therefore follows that a valid PC form shall be part of the training records. They must show that the pilot is properly licensed with a Group 1 or P2X endorsement on his Hong Kong License and that all Schedule 9 and 11 and CAD 360 requirements have been met including evidence of competence in AEP/SEPT, RVSM, LVO, GPS approaches, RNP and any special airspace qualification, CRM, route and airfield qualification.

9.3.7.4 Once a pilot commences LFUS, appropriate line sector records and the Final Line Check form must be in the training file.

9.3.7.5 After a pilot has completed his first recurrent PC, his conversion training records may be archived. However, the training file must always include a valid PC, Line Check and certificates to confirm qualification in accordance with Schedule 9 and 11 requirements.

9.3.7.6 It is acceptable to maintain all training records in an electronic format provided it is secure, with a satisfactory backup system and it has been agreed with CAD.

9.4 **Proficiency Check – Cruise Only Co-Pilots (P2X)**

9.4.1 P2X pilots must complete all Schedule 11 items for their respective aircraft types during the relevant period. In addition the Schedule 9 items namely the "boxed" items of the Form DCA528 (AR) and the Instrument Rating (IR) must be completed to ensure that a P2X pilot is properly rated for his respective aircraft type(s). Both the AR and IR certificates are to be signed on satisfactory completion of the PC.

9.4.2 P2X pilots will not normally be exposed to aircraft handling below cruise altitude, therefore it is important that simulator training and refresher details cover all aspects of the normal and emergency operation of the aircraft.

9.4.3 Where an examiner judges the quality of any exercise to be only just acceptable, the operator should expose the subject to more frequent PCs and training. This is particularly true of young inexperienced pilots who may need reassurance that such training and checks are a normal part of operating life.

9.5 **Line Checks - All Pilots**

9.5.1 The annual line check is not intended to determine competence on any particular route. The requirement is for a test of ability to perform satisfactorily a complete line operation from start to finish, including pre-flight and post-flight procedures and use of the equipment provided. The route chosen should be such as to give adequate representation of the scope of a pilot's normal operations. The line check is considered a particularly important factor in the development, maintenance and refinement of high operating standards and can provide the operator with a valuable indication of the efficacy of his training policy and methods.

9.5.2 The operator has a statutory obligation to check that his pilots are competent to perform their duties. If it is company policy that both pilots may carry out either the handling or the non-handling duties, both Captains and co-pilots should be checked in both roles. Captains who also operate as co-pilots must be checked in both left and right hand seats.

9.5.3 In addition to the above duties, the flight crew should be assessed in CRM techniques, including command decision making. This is most readily achieved if the examiner occupies the jump seat.

9.5.4 When line checks are carried out on sectors which terminate away from base, the operator should allow for the possibility that on subsequent sectors the examiner may have to act as substitute for either the Captain or co-pilot. The examiner should therefore be fully qualified to operate at any crew station over which he acts in an examining capacity.

9.5.5 Line checks fall into two categories as follows:

(a) FINAL line check: Following completion of route flying 'under supervision', a two sector line check, one handling and one non-handling (one combined sector for holders of P2X ratings) will be flown with a training captain at the controls. If successful, the 'under supervision' restriction is removed and re-certified as such on the candidate's records.

(b) ANNUAL line check: This will normally take the form of a two sector line check, one handling and one non-handling check (one combined sector for holders of P2X ratings) and may be accomplished in one of two ways. Firstly, the training captain may occupy a seat at the controls and fly as Captain; secondly, he may occupy the jump seat and run a concurrent check on the operating crew (but see paragraph 9.5.6 below). He could not in this case be PIC. It should be noted that a Training Captain's Line Check must consist of a minimum of four sectors – in addition to a 2 sector check in the left hand seat, Training Captains must complete a 2 sector check in the right hand seat, both

comprising of a sector Pilot Flying and a sector Pilot Monitoring.

9.5.6 Should a pilot run out of check or fail a line check, he may not operate on a public transport flight except 'under supervision' until he is again fully qualified. All such supervised flying, and the line check required for requalification, requires a training captain to be at the controls.

9.6 Captains and Co-Pilots - Instrument Approach Proficiency

9.6.1 A further separate requirement to be met in respect of the Captain and copilot is that they must have been tested as to their proficiency in using instrument approach systems of the type in use at the aerodrome of intended landing and any alternate aerodrome; this will also include Low Visibility Operations (LVO) procedures, where applicable. The tests may be carried out in a flight simulator approved for the purpose. The instrument approach to land tests (non-LVO) may also be carried out in flight in actual or simulated IMC.

9.6.2 To comply with this requirement, operators may find it convenient to ensure that Captains and co-pilots are tested on their proficiency to carry out instrument approach procedures using all the pilot interpreted aids provided in the aircraft they operate. A separate test or record to cover the requirement may not be necessary, as it is possible to meet the regulation in the course of the bi-annual Proficiency Check by the inclusion of an NDB, VOR, GPS, LOC only or ILS Back Beam approach.

9.6.3 On suitable aircraft types where electronic instrumentation allows portrayal of both the NDB and the VOR angular deviation as either a needle or a beam bar presentation, the requirement for VOR and NDB can be combined and satisfied on conversion, provided the pilot has been tested performing one non-precision approach using a beam bar, and another using the needle.

9.6.4 The Constant Descent Final Approach (CDFA) is the preferred method for conducting a non-precision instrument approach. This technique should be utilised whenever possible in high performance transport aircraft as it is conducive to a stabilised approach and landing.

9.7 Captains - Route and Aerodrome Competence

9.7.1 An operator must ensure that the pilot designated as Captain of an aircraft has demonstrated to the operator's satisfaction adequate knowledge of the route to be flown and of the aerodromes (including alternates), facilities and procedures to be used. The period of validity of the route and aerodrome competence qualification is 13 months. However, the qualification may be re-validated during that period by operating on the route or to the aerodrome concerned.

9.7.2 Route competence training should include knowledge of:

(a) terrain and minimum safe altitudes;

(b) seasonal meteorological conditions;

(c) meteorological, communication and air traffic control facilities, services and procedures;

(d) navigational facilities associated with the intended route of flight;

(e) search and rescue procedures.

9.7.3 Depending on the complexity of the route, as assessed by the operator, the following methods of familiarisation may be used:

(a) for the less complex routes, familiarisation by self briefing with route documentation or by means of programmed instruction; and

(b) for the more complex routes, in addition to (a) above, in flight familiarisation as a co-pilot, observer or Captain under supervision, or familiarisation in an approved flight simulator using a data base appropriate to the proposed route.

9.7.4 The operations manual should specify a method of categorisation of aerodromes and specify the qualification requirements for each of these categories. If the least demanding aerodromes are Category A, Category B and C should be applied to progressively more demanding aerodromes. The operations manual should specify the parameters which qualify an aerodrome to be considered as Category A and then provide a list of those aerodromes categorised as B and C.

9.7.5 All aerodromes an operator intends to use should be categorised in one of those three categories. Such categorisation must be acceptable to the Department and based on the following guide lines.

9.7.6 *Category A.* An aerodrome which satisfies all of the following requirements:

(a) an approved instrument approach procedure;

(b) at least one runway with no performance limited procedure for take-off and/or landing;

(c) published circling minima not higher than 1000 feet above aerodrome level; and

(d) Night operations capability.

9.7.7 *Category B.* An aerodrome which does not satisfy the Category A requirements or which requires extra considerations such as:

(a) non-standard approach aids and/or approach patterns; or

(b) unusual local weather conditions; or

(c) unusual characteristics or performance limitations; or

(d) any other relevant considerations such as obstructions, physical layout, lighting etc.

9.7.8 *Category C.* An aerodrome which requires additional considerations to a Category B aerodrome.

9.7.9 Prior to operating to a Category B aerodrome, a Captain should be briefed, or self briefed by means of programmed instruction, on the Category B aerodrome(s) concerned and should certify that he has carried out these instructions.

9.7.10 Prior to operating to a Category C aerodrome, a Captain should be briefed and visit the aerodrome as an observer and/or undertake instruction in a flight simulator approved by the Department for the purpose. The instruction should be certified by the operator.

9.8 Recent Type Experience (Handling Recency)

9.8.1 A pilot whose Hong Kong Licence includes a valid and appropriate aircraft rating Certificate of Test for the aircraft type, and who has been certified by the said pilot's Hong Kong AOC operator as being competent to perform duties as commander or co-pilot shall have maintained take off and landing recency if within the 3 months, which immediately precedes the commencement of the public transport flight, the said pilot has completed a minimum of 3 take offs and 3 manual landings, in the aircraft of the type to be used on the flight. For revalidation of the 3-month take-off and landing recency, operators shall refer to Appendix F of this Chapter.

9.8.2 A Captain shall also have made, in the preceding 35 days, at least one complete flight involving one take-off and landing in an aircraft of the type to be used on the flight. In some cases, approved flight simulators may be used, but operators should consult their assigned Inspector before using flight simulators for this purpose. A Captain may revalidate his 35 day recency by carrying out a take-off and landing during a public transport flight provided he is not operating as Captain on that flight.

9.8.3 **Helicopter** pilots require 2 hours simulated or actual instrument flight in the preceding 60 days to achieve instrument recency; this may be extended to 90 days if the pilot has undergone, during the preceding 30 days, at least one hour in a simulator approved for the purpose of instrument rating renewal. Four approaches, appropriate to company operations, which may include flight simulator approaches in a simulator approved for instrument rating renewals, must be flown during the preceding 90 days.

9.8.4 Instrument rated helicopter pilots who are predominantly used on VMC operations require 2 hours simulated or actual instrument flight during the preceding 60 days; 2 instrument approaches during the preceding 60 days, which should include at least 1 instrument approach during the preceding 30 days.

9.9 Pilot Qualification for Operations in Either Seat

9.9.1 Pilot Flying (PF) duties including take offs and landings, may only be completed from the seat in which the PC was completed. Any Captain required to complete PF duties from the right-hand seat must complete additional training and testing as specified in CAD 360 and in the operator's training manual, concurrent with the operator's competency checks prescribed in Schedule 11. This additional training which normally will be conducted during the PC must include at least the following:

(a) an engine failure during take-off;

(b) a one engine inoperative approach and go-around; and

(c) a one engine inoperative landing.

(d) any additional significant differences in operating from either seat, must be included in both the initial and recurrent training programme.

Note: The designated Captain for the flight will operate from the left-hand seat

except when as a Training Captain he/she is required to conduct LFUS sectors from the right-hand seat. When operating in the right-hand seat, the checks required by Schedule 11 for operating in the left-hand seat must, in addition, be valid and current.

9.9.2 For Initial Qualification for the Captains to fly from the Right Seat after completion of the PC which includes the supplementary Training and Checking for Right Seat flying, a minimum of 2 Sectors LFUS must be provided as PF, prior to a 2 Sector Line Check from the Right Seat (1 Pilot Flying and 1 Pilot Monitoring).

9.9.3 For Right Seat qualified Captains, an additional 2 Sector Line Check will be required (1 Pilot Flying and 1 Pilot Monitoring) annually.

9.9.4 A pilot relieving the Captain must demonstrate practice of drills and procedures, concurrent with the operator's competency checks prescribed in Schedule 11, which would otherwise have been the Captain's responsibility. Where the differences between left and right seats are not significant (for example because of use of autopilot) then practice may be conducted in either seat.

10 USE AND APPROVAL OF FLIGHT SIMULATORS AND TRAINERS

10.1 Provision is made in the AN(HK)O for use of apparatus such as flight simulators, flight trainers and fuselage 'mock-ups' for certain periodical tests. These devices must be individually approved by the Department and may be used only under the supervision of a person approved for the purpose. Approvals normally restrict the use of such devices to the particular company's own flight crews. Examiners' simulator authority extends only to the device(s) for which the company named on this authority holds a specific written approval.

10.2 All training staff should be instructed that training and checking exercises conducted in simulators and flight trainers should be treated from a flight safety aspect as if they were being carried out on an actual aircraft. Therefore, close adherence to established operating procedures and practices, particularly crew monitoring, call-outs and incapacitation procedures should be emphasised. Practising or continuing unsafe manoeuvres should be strongly discouraged.

10.3 Prior to each simulator session, examiners should check the serviceability in the technical log and the level to which the simulator is cleared, as it may change from time to time and at short notice. Additionally, the examiner should carefully check the the "Flight Simulator Approval" document to confirm the simulator's validity for checks and tests.

11 GENERAL CONSIDERATIONS FOR TESTS

11.1 Any method of simulating instrument flight conditions for the purpose of testing pilots must be approved by the assigned Inspector and, in the case of screens attached to the structure of the aircraft, approval must also be obtained from the Airworthiness Office of the CAD.

11.2 Instrument flight conditions may not be simulated on any flight for the purpose of public transport of passengers, nor may any emergency manoeuvres be simulated on such a flight.

11.3 Stopping of engines in flight should be subject to the recommendations and advice issued by the Department. Guidance can be obtained from the assigned inspector.

12 SAFETY AND EMERGENCY PROCEDURES (SEP)

12.1 The purpose of emergency and survival training and testing is to provide flight deck crews with the necessary skills and knowledge to deal with different types of emergency and survival situations. A successful aircraft evacuation depends heavily on effective communications between the flight crew and the cabin crew.

12.2 Operators are to ensure that they have an established procedure for all flight deck crew to receive instruction on any new emergency and survival equipment that is introduced.

12.3 Operators may use either an aircraft or a 'mock-up' for emergency training and testing. Details regarding the approval of training apparatus and the approval of personnel responsible for conducting the training and testing on the equipment are contained in Chapter 6 'Emergency and Survival Training Practice and Testing Requirements for Flight Crew and Cabin Crew'.

12.4 Suitable training aids will facilitate the presentation of both classroom and practical sessions. Inspectors may wish to observe the training, practice and tests in progress.

12.5 Before flying training commences on an actual aircraft, flight crew are to complete successfully the training, tests and practice described in Chapter 6 which must have been certified in the trainee's records.

13 RECORDS OF TRAINING AND TESTS

13.1 Records showing a trainee's progress through each stage of training must be maintained. These should indicate the number of times each exercise in base and line training was covered and should include information about the results of tests. Records must incorporate certificates indicating the competence of examinees to perform the duties in respect of which they have been tested. Inspectors will advise operators on the form of records and certificates.

13.2 Operators must keep records for all aircraft flight crew members showing the dates on which tests, ratings, medical certificates, licences etc are all due for renewal. There should also be an effective system to guard against aircraft flight crews being rostered for duty, when checks etc are overdue, and for verifying that licences etc have been renewed at the appropriate time.

13.3 Where Schedule 9 and Schedule 11 tests are integrated as described in paragraph 4.2.2, the operator may use combined report forms subject to agreement of the format by the Department.

13.4 Records of all conversion courses and recurrent training and testing must be made available, on request, to the flight crew member concerned.

13.5 A person must be nominated as responsible for the maintenance of training records and be identified as such in the operations manual.

NOTE: A full list of Schedule 9 & 11 tests, their sources and periods of validity is at Appendix A to this Chapter.

14 RETRAINING AND RETESTING

14.1 Operators must ensure that training staff are adequately instructed on the action to be taken when unsatisfactory performance by a crew member, either during training or line operations, leads to retesting or further training. For example, following an unsatisfactory base check, a crew member should not be immediately subjected to a series of retests in the item(s) concerned until an acceptable standard is achieved. If the failure points to a fundamental weakness in ability or technique, adequate remedial training should be given before further testing.

14.2 If a crew member is found to be unsatisfactory during the course of line operations, the Captain should report the circumstances without delay and the crew member should be withdrawn from further duty until retraining and/or retesting has been carried out. A record should be kept of any action taken.

15 FLIGHT CREW CONVERSION TRAINING

15.1 Syllabi

All type conversion training should be conducted in accordance with detailed syllabi included in the training manual. The syllabi should be designed to reflect the experience level of the trainee. This could be low and therefore provision should be made to give sufficient training by allowing extra time, when necessary, to reach and maintain a safe operating standard. When considering programmes and syllabi for newly acquired aircraft types, operators are strongly urged to consult the assigned Inspector at the outset. Early consultation will help to prevent difficulties and inconvenience to the operator.

NOTE: Amendments or additions to the training manual relating to training experience, practice and periodical tests on a newly acquired aircraft type must be submitted to the Department **before** the aircraft may fly for the purpose of public transport.

15.2 Minimum Experience Requirements

The minimum standards of qualifications and experience required of flight crews before being rostered for conversion training should be specified in the training manual.

15.3 **Ground Training**

15.3.1 Great importance is attached to technical training and there should be a properly organised programme of ground instruction by competent tutors with adequate facilities, including any necessary audio, mechanical and visual aids. If the aircraft concerned is relatively simple, private study may be adequate, if the operator provides suitable manuals and/or study notes. Inspectors will wish to examine premises and equipment to be used for ground training. They are also authorised to be present while tuition and lectures are in progress.

15.3.2 Courses of ground instruction for flight crews should incorporate written progress tests at the end of each distinct phase. Pilots, for example, should be examined on such matters as engines, airframes, flight director systems, radio and electrics, performance and flight planning, as each phase of ground training is completed.

15.3.3 For all flight crews, the ground course should include comprehensive instruction on the location and use of all emergency equipment carried in the aircraft and practice in the procedures for emergency evacuation, and procedures on taxi operations and active runway identification.

15.3.4 The annual 'emergency/survival' test detailed in Chapter 6 should be undertaken before any flying training is started.

15.3.5 Once an operator's conversion course has been commenced, a flight crew member should not undertake flying duties on another type or class of aircraft until the course is completed or terminated.

15.4 **Aircraft/Flight Simulator Training**

15.4.1 Flying training should be structured and sufficiently comprehensive to familiarise the flight crew member thoroughly with all aspects of limitations and normal/abnormal and emergency procedures associated with the aircraft, and should be carried out by suitably qualified TRIs and/or TREs. For specialised operations such as ETOPS, LVO or steep approaches, additional training should be carried out.

15.4.2 In planning training on aircraft types with a flight crew of two or more, particular emphasis should be placed on the practice of LOFT with emphasis on CRM.

15.4.3 Normally, the same training and practice in the flying of the aircraft should be given to co-pilots as well as Captains. The 'flight handling' sections of the syllabus for Captains and co-pilots alike should include all the requirements of the appropriate type rating tests together with the following items, if appropriate to the aircraft type. For co-pilots holding a P2X type rating whose duties are to be limited to 'cruise only', ie above FL 200, training is to be limited to an approved flight simulator.

(a) aeroplanes:

(i) visual circuits and landings by day and by night, including approaches without glideslope guidance and correction of displacement in azimuth and elevation on final approach;

(ii) visual 'go around' from not more than 200 ft agl;

(iii) engine failure before V_1;

(iv) take-off with engine failure between V_1 and V_2, or as soon as safety considerations permit;

(v) in instrument flight conditions with an outboard engine inoperative, a full manual ILS procedure, including a holding pattern, to decision height followed by a go-around;

(vi) landing with one engine inoperative;

(vii) landing with asymmetric reverse thrust;

(viii) failures of flight director system, including ILS approach without flight director;

(ix) a typical noise abatement procedure;

(x) approach to the stall and recovery, including operation of any stall warning devices and/or stick pusher;

(xi) emergency descent with and without use of autopilot;

(xii) automatic approach/landing training including disconnects at critical stages of approach and landing;

(xiii) use of autothrottle in manually controlled flight; and

(xiv) taxi operations and active runway identification.

(b) helicopters:

(i) practice of appropriate type rating test items under instrument flight conditions, including failure of flight instruments and flight directors;

(ii) recovery from unusual attitudes under instrument flight conditions.

15.4.4 Each exercise should be practised until a satisfactory standard is achieved. The various take-off, 'go-around' and landing exercises should be performed at least twice. Records kept by the operator should show the number of times that each exercise was covered. Unless the type rating training programme has been carried out in an appropriate flight simulator approved for zero flight time conversion, the training must include at least 3 take-offs and landings in the aircraft.

15.4.5 Particular emphasis should be placed on the practice of correct flight crew procedures for take-off, approach, landing and 'go-around' plus, for helicopter pilots, the procedures for IMC descent en-route in conditions of low cloud and poor visibility.

15.4.6 Pilots undergoing conversion training should at some stage be given an exercise in coping with incapacitation of another flight crew member.

15.5 Additional Requirements for Captains

15.5.1 Without prejudice to any of the requirements of a particular type rating test, the conversion training of Captains should include the following items insofar as they may be appropriate to the aircraft type:

(a) landing with two engines inoperative;

(b) landing without flap/slat or with restricted flap;

(c) landing with flying control system malfunction;

(d) instrument approach and 'go-around' with flight director malfunction;

(e) landing at night with one engine inoperative;

(f) crosswind take-off and landing.

15.5.2 Captains must also be given practice in the stopping and starting of engines in flight and in any emergency drills that might fall to them while the co-pilot is handling the aircraft.

15.6 **Additional Requirements for Co-Pilots**

It is essential that co-pilots (in addition to the handling practice already referred to) should be given adequate training, during the simulator conversion course, in the execution of all emergency drills that might fall to them while the Captain is flying the aircraft. Co-pilots should also be given practice in the operation of aircraft systems and radio equipment normally managed by the co-pilot, while the Captain is handling the aircraft.

15.7 **Tests After Flying Training**

15.7.1 Before they are assigned to line duty (whether under supervision or not) all flight crew must be certified as competent by the operator in accordance with the requirements of Schedule 11 Part B of the AN(HK)O. Testing in these functions and duties **must not** be conducted in the course of normal operations. All conversion flying training must therefore incorporate a PC and an instrument approach-to-land PC before a flight crew member is assigned to line duty.

15.7.2 Before they are assigned to line duty all flight crew must complete LFUS and a line check on the new type. It is accepted, however, that this check could begin and end at the same aerodrome, may be of relatively short duration and may be made as part of the conversion training. It is essential, nevertheless, that pilots should demonstrate proficiency in the flight planning procedures for the new type, ability to operate in accordance with an IFR air traffic clearance whilst performing normal functions on the flight deck, as well as proficiency in the use of the installed radio and radar aids. Furthermore, all flight crew members must demonstrate their proficiency in operating the aircraft as both PF and PNF from the control seat in which they completed their PC. However, a Line Training Captain, need complete only one PNF sector. Following a satisfactory line check the operator must certify the pilot's competence, to operate as Captain or co-pilot.

15.8 **Line Flying Under Supervision (LFUS)**

15.8.1 For all aircraft conversion courses (non ZFT), the first LFUS flight must be within three months of the completion of the simulator course. Each flight crew member should operate a minimum number of sectors and/or flying hours under the supervision of a flight crew member nominated by the operator and acceptable to the Department.

15.8.2 The minimum sectors/hours should be specified in the operations manual and should be determined by the following:

(a) previous experience of the flight crew member;

(b) complexity of the aircraft; and

(c) the type and area of operation.

15.8.3 The 'under supervision' period should not be used for the completion of the basic conversion syllabus. Its purpose is twofold. Firstly, it will enable the newly converted crew member to settle down to his duties on the new type in the company of an experienced and suitably qualified crew member specially designated for the purpose and to turn to him for advice, if necessary. Secondly, it will enable the training staff to assess and verify the adequacy of the conversion training and to ensure that proper operating standards are achieved at the outset, in the course of normal and varied operations.

15.8.4 'Under supervision' means:

(a) for a Captain flying with an experienced pilot, qualified to act as the aircraft Captain and specially designated by the operator to act as a supervising pilot, who should occupy the seat and perform the duties of co-pilot. Some operators may wish the newly converted Captain to operate a few sectors in the co-pilot's seat; this is acceptable, if the supervising Captain is in the Captain's seat and the new Captain carries out the additional requirements detailed in paragraph 9.9 of this Chapter;

(b) for a co-pilot: flying in the co-pilot's seat with a qualified Captain, specially designated for the purpose, occupying the Captain's seat.

15.8.5 In some types of aircraft it may be necessary, while a co-pilot is flying his sectors under supervision, to carry a fully qualified co-pilot in addition. It must be clearly understood, however, that to meet the statutory requirements relating to the minimum flight crew to be carried, a pilot occupying the co-pilot's seat must be qualified for all the duties to be performed in that seat. As in the case of line checks, supervisory staff should be qualified to take over in any crew role over which they exercise supervision.

15.8.6 On completion of the sectors under supervision a further line check is to be administered. If no flying 'under observation' is required (see paragraph 15.8.7), successful completion of the line check and acceptance by the operator of such a check will release a pilot to the line. The subsequent rostering together of two newly qualified pilots should be avoided wherever possible.

15.8.7 The 'under supervision' sectors carried out by a newly qualified Captain will have been completed with an experienced supervisory Captain acting as co-pilot. Some operators may therefore wish to carry out a further period of flying under observation after the final line check, teaming the new Captain with a standard crew and with a suitably qualified pilot, specially designated for the purpose, occupying the jump seat and acting only in an advisory capacity. It should be made clear that in this situation the newly qualified Captain is the Captain of the aircraft and will be certified as having passed a final line check. Similarly, operators may wish to consolidate a co-pilot's training subsequent to his final line check, by using a qualified supervisory co-pilot or

Captain in the jump seat and a Captain who has passed his final line check as the Captain of the aircraft, in the left hand seat. To avoid confusion, all such flying should be called 'sectors under observation'. Before being released to the line, a post-observation check shall have been passed, and accepted by the operator.

15.8.8 Where the operator wishes to deviate from any of the minimum requirements in his training manual (perhaps because of a pilot's previous experience on type with another operator), this must not be authorised by the operator before consulting the Department In any such case, training documentation should be annotated accordingly.

15.9 **Cruise Relief Co-pilots (P2X - rated)**

15.9.1 Co-pilots trained only for relief duties in the cruise may occupy a control seat above FL200. Minimum training and checking requirements are as follows:

(a) conversion training and checking should follow the syllabus for a co-pilot, but excluding take-offs and landings in an aircraft. The Form DCA528 test items for a P2X aircraft type rating should be completed.

(b) recurrent training and checking should be as prescribed in Schedule 11. The items for a P2X Certificate of Test should be completed.

(c) Take-off and landing recency as prescribed in Schedule 11 is not required. The pilot must, however, carry out flight simulator recency and refresher flying skill training at intervals not exceeding 90 days. This refresher training may be combined with recurrent training if desired.

15.10 **Use of a Flight Simulator for Conversion Training**

15.10.1 The extent to which a flight simulator may be used for conversion training will be considered according to individual circumstances.

15.10.2 It is essential that there is commonality of instrumentation and controls between the aircraft and the flight simulator used for conversion and recurrent training and testing. Where differences exist they will be subject to an agreement between the operator and the Department.

15.11 **Variants of the Same Aircraft Type**

A company may operate a number of aircraft which, though of the same type, are not identical. They may differ in engines, systems, equipment, flight deck lay-out, operating procedures, performance or in other respects. In such circumstances the operator must conduct a 'differences course' for his crews to ensure they are adequately trained on each variant. Operators should consult their assigned Inspector for advice on the form and content of such a course.

16 UPGRADE TO CAPTAIN

16.1 An operator shall ensure that for upgrade from co-pilot to Captain and for pilots joining as direct entry Captains:

(a) a minimum level of experience acceptable to the Department is specified in the operations manual;

(b) for multi-crew operations, the pilot completes an appropriate command course.

16.2 The content of the command course must be specified in the operations manual and should include at least the following:

(a) flight simulator and/or flying training, including LOFT;

(b) CRM training and Captain's responsibilities;

(c) completion of an operator's PC acting as Captain;

(d) line training in command under supervision. A minimum of 10 sectors is required for pilots already qualified on aircraft type;

(e) completion of a Captain's line check and route and aerodrome competence qualifications.

17 BASE TRAINING REQUIREMENTS

17.1 Pilots undergoing CCQ conversion courses do not require ABT.

17.2 For conversion courses leading to the grant of an aircraft rating, the pilot will require ABT unless all the requirements outlined in Appendix C of this chapter are fulfilled.

17.3 For CCQ conversion courses, Zero Flight Time Training (ZFTT) and/or Simulator Base Training (SBT), the Operators shall refer to Appendix C and "Important Notes for the Completion of Form DCA528 (Aeroplanes)" for detailed information and requirements on simulator conversion courses.

17.4 By achieving 3 take-offs and 3 landings in the aircraft, either during base training (as required by paragraph 17.2 above) or during LFUS, the 3-month take-off and landing recency described in paragraph 9.8.1 of this Chapter is deemed to be established.

18 CREW RESOURCE MANAGEMENT (CRM) TRAINING

18.1 General

18.1.1 CRM is the effective utilisation of all available resources (e.g. crew members, aircraft systems and supporting facilities) to achieve safe and efficient operation. The objective of CRM is to enhance the communication and management skills of the crew member concerned. The emphasis is placed on the non-technical aspects of crew performance.

18.1.2 CRM training should include the following elements:

(a) statistics and examples of human factor related accidents;

(b) human perception, learning process, situational awareness;

(c) management of workload, tiredness or fatigue, and vigilance;

(d) management of stress;

(e) personality type, delegation, leadership, effective communication skills;

(f) the CRM loop (notion of synergy):

inquiry - advocacy - conflict resolution - decision making - critique - feedback;

(g) operator's standard operating procedures;

(h) effective communication and co-ordination within the crew, and between crew members and other operational personnel (air traffic controllers, maintenance personnel etc.);

(i) error chain and actions to break the error chain;

(j) implications of automation on CRM.

18.1.3 CRM training should also address the nature of the company's operations as well as the associated crew operating procedures. This will include areas of operations which present particular difficulties, adverse climatological conditions and any unusual hazards.

18.1.4 CRM training should include both classroom training and practical exercises including group discussions and accident reviews to analyse communication problems and instances of a lack of information or crew management.

18.1.5 Ideally, a CRM training course should last a minimum of 3 days, but, providing the whole syllabus is covered, a 2 day course is acceptable. An operator may use a course provided by another operator if that course is acceptable to the Department.

18.2 **Initial Conversion Training**

Operators should ensure that all flight crew complete a CRM course with a full length syllabus within 12 months of commencing airline operations. If a flight crew member undergoes a subsequent conversion course with the same or a change of operator he should complete the appropriate elements of the CRM course. The flight crew member should not be assessed either during or on completion of such a course.

18.3 **Recurrent Training**

18.3.1 Where an operator utilises LOFT in the recurrent training programme the flight crew member should complete elements of CRM training. Where an operator does not utilise LOFT, the flight crew member should complete elements of CRM training every year. The flight crew member should not be assessed.

18.3.2 An operator should ensure that flight crew members complete the major elements of the full length CRM course over a four year recurrent training cycle. This refresher training should not be assessed.

18.3.3 When a flight crew member undergoes an operator's competency check, line check or command course, then CRM skills should be included in the overall assessment.

18.4 **Combined Training**

18.4.1 Operators should, as far as is practicable, provide combined training for flight crew and cabin crew. There should be effective liaison between flight crew and cabin crew training departments, and provision should be made for flight and cabin crew instructors to observe and comment on each other's training.

18.4.2 The successful resolution of aircraft emergencies requires interaction between flight crew and cabin crew, and emphasis should be placed on the importance of effective co-ordination and two-way communication between all crew members in various emergency situations. Initial and recurrent CRM training should include joint practice in aircraft evacuation, so that all who are involved are aware of the duties other crew members should perform. When such practice is not possible, combined training should include joint discussion of emergency scenarios.

19 HELICOPTER PILOTS' PERIODIC TESTS

Cancelled – refers to CAD 360 Helicopter Supplement

20 FLIGHT OPERATIONS OFFICER / FLIGHT DISPATCHER

20.1 A flight operations officer / flight dispatcher should not be assigned to duty unless that officer has:

(a) made within the preceding 12 months, at least a one-way qualification flight on the flight deck of an aeroplane over any area in which that individual is authorised to exercise flight supervision. The flight should include landings at as many aerodromes as practicable;

(b) demonstrated to the operator a knowledge of:

(i) the contents of the operations manual of the operator;

(ii) the radio equipment in the aeroplanes used; and

(iii) the navigation equipment in the aeroplanes used;

(c) demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorised to exercise flight supervision:

(i) the seasonal meteorological conditions and the sources of meteorological information;

(ii) the effects of meteorological conditions on radio reception in the aeroplanes used;

(iii) the peculiarities and limitations of each navigation system which is used by the operation; and

(iv) the aeroplane loading instructions;

(d) demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties; and

(e) demonstrated to the operator the ability to perform the duties specified in ICAO Annex 6 Part I Para. 4.6.

20.2 A flight operations officer / flight dispatcher assigned to duty should maintain complete familiarization with all features of the operation which are pertinent to such duties, including knowledge and skills related to human performance.

20.3 A flight operations officer / flight dispatcher should not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of para. 20.1 are met.

CHAPTER 5 - APPENDIX A

SUMMARY OF TEST REQUIREMENTS

AN(HK)O - SCHEDULE 9
(LICENCES & RATINGS)

ITEM	REFERENCE	VALIDITY	NOTES
Instrument Rating Certificate of Test (Renewal)	PART C para 3 & 4	13 Months	May be type specific. Valid from date final item completed. Refer CAD if expired more than 5 years.
Aircraft Type Rating Certificate of Test (Initial Grant)	PART C para 3 & 4	6 Months	All test items on Form DCA528 within 6 month period. Valid from date final C of T item complete.
Aircraft Type Rating Certificate of Test (Renewal)	PART C para 3 & 4	*# 6 Months	The "Boxed items" on Form DCA528 only. Valid from date final item completed. Refer CAD if expired more than 5 years.
Certificate of Experience	PART C para 5 & 6	6 Months (Aerial Work)	Signed by "Authorised Person" Validity for PPL - 13 Months

AN(HK)O - SCHEDULE 11
(PUBLIC TRANSPORT)

ITEM	REFERENCE	VALIDITY	NOTES
Proficiency Check (Pilots)	PART B 1(2)(a)(ii)	*# 6 Months	Valid from date first item completed.
Line Check (Pilots)	PART B 1(2)(a)(i)	*13 Months	Initial check reqd before line flying. Handling & Non-handling sectors.
Instrument Approach to Land	PART B 1(2)(c)(i)	# 6 Months	May be combined with IR renewal test. LVO procedures may also be required.
Commander's Route Competence	PART B 1(5)(a) & (b)	13 Months	Briefing, simulator or visit. No formal test requirement.
Handling Recency	PART B 1(2)(c)(ii)	3 Months	3 Take-offs & 3 Landings. In Approved Simulator by Exemption.
Safety and Emergency Procedures (SEP)	PART B 1(1)(a) & (b)	13 Months	Must be completed and certified prior to any flying training.

Notes # Valid 13 months from date of first test, if 2 tests, separated by not less than 4 months, are conducted in the period.
* Tests alternate where Mixed Fleet Flying is approved on similar types.

CHAPTER 5 - APPENDIX B

OPERATION ON MORE THAN ONE TYPE OR VARIANT

1. **Single Pilot**

1.1 When a flight crew member operates more than one aeroplane class, type or variant, but not within a single licence endorsement, an operator must comply with the following:

A flight crew member shall not operate more than:

(a) Three piston engined aeroplane types or variants; or

(b) Three turbo-propellor aeroplane types or variants; or

(c) One turbo-propellor aeroplane type or variant and one piston engined aeroplane type or variant; or

(d) One turbo-propellor aeroplane type or variant and any aeroplane within a particular class.

1.2 All Schedule 9 and 11 requirements for each type or variant operated unless the operator has demonstrated specific procedures and/or operational restrictions which are acceptable to the Authority.

2. **Multi Pilot**

2.1 When a flight crew member operates more than one aeroplane type or variant within one or more licence endorsements, an operator shall ensure that:

(a) The minimum flight crew complement specified in the operations manual is the same for each type or variant to be operated;

(b) A flight crew member does not operate more than two aeroplane types or variants for which a separate licence endorsement is required; and

(c) Only aeroplanes within one licence endorsement are flown in any one flight duty period unless the operator has established procedures to ensure adequate time for preparation.

(d) Notwithstanding the above, for operations on multi crew turbine-jet aeroplanes having a maximum total weight authorised exceeding 40,000 KG, which are operated by an air transport undertaking under a Certificate of Airworthiness in the Transport Category, prior approval will need to be sought from the Civil Aviation Department. Any approval will be subject to satisfactory submission with justification and on a case by case basis.

Note: In cases where more than one licence endorsement is involved, see sub-paragraphs 2.2 and 3.1 below.

2.2 When a flight crew member operates more than one aeroplane type or variant, but not within a single licence endorsement, an operator must comply with the following

2.2.1 Subparagraphs 2.1(a),(b) and (c) above;

2.2.2 Before exercising the privileges of two licence endorsements:

(a) Flight crew members must have completed two consecutive operator proficiency checks and must have 500 hours in the relevant crew position in commercial air transport operations with the same operator;

(b) In the case of a pilot having experience with an operator and exercising the privileges of two licence endorsements, and then being promoted to command with the same operator on one of those types, the required minimum experience as commander is six months and 300 hours, and the pilot must have completed two consecutive operator proficiency checks before again being eligible to exercise two licence endorsements.

2.2.3 Before commencing training for and operation of another type or variant, flight crew members must have completed three months and 150 hours flying on the base aeroplane which must include at least one proficiency check.

2.2.4 After completion of the initial line check on the new type, 50 hours flying or 20 sectors must be achieved solely on aeroplanes of the new type rating.

2.2.5 Schedule 11 recency requirements for each type operated unless credits have been allowed by the Department in accordance with sub-paragraph 2.2.7 below.

2.2.6 The period within which line flying experience is required on each type must be specified in the operations manual.

2.2.7 Where credits are sought to reduce the training and checking and recent experience requirements between aeroplane types, the operator must demonstrate to the Department which items need not be repeated on each type or variant because of similarities.

(a) Schedule 9 requires two operator proficiency checks every year. When credit is given in accordance with sub-paragraph 2.2.7 above for operator proficiency checks to alternate between the two types, each operator proficiency check revalidates the operator proficiency check for the other type. Provided that the period between Licence proficiency checks does not exceed that prescribed for each type, the above requirements will be satisfied. In addition relevant and approved recurrent training must be specified in the operations manual.

(b) Schedule 11 requires one line check every year. When credit is given in accordance with sub-paragraph 2.2.7 above for line checks to alternate between types or variants, each line check revalidates the line check for the other type or variant.

(c) Annual Safety and Emergency Procedures (SEP) training and checking must cover all requirements for each type.

2.2.8 Schedule 9 for each type or variant operated unless credits have been allowed by the Department in accordance with sub-paragraph 2.2.7 above.

2.3 When a flight crew member operates combinations of aeroplane types or variants (class - single pilot and type - multi pilot), an operator must demonstrate that specific procedures and/or operational restrictions are approved in accordance with Chapter 5 paragraph 8.

3. **Single Pilot and Multi Pilot**

3.1 When a flight crew member operates more than one aeroplane type or variant, but not within a single licence endorsement, an operator must comply with:

(a) Subparagraphs 2.1(a), (b) and (c) above;

(b) Subparagraph 2.2 above.

4. **Helicopters**

When a flight crew member operates more than one helicopter type or variant, an operator shall ensure that appropriate procedures approved by CAD are included in the company operations manual.

5. **Type conversion training**

Once an operator's conversion course has been commenced, a flight crew member shall not undertake flying duties on another type until the course is completed or terminated.

CHAPTER 5 - APPENDIX C

ZERO FLIGHT TIME TRAINING (ZFTT) AND/OR SIMULATOR BASE TRAINING (SBT) REQUIREMENTS

1. **Flight Simulator Requirements:-**

1.1. In order to obtain the approval for an aircraft type rating, any training course that incorporates ZFTT and/or SBT must adhere to the following criteria:

a) The flight simulator to be used shall be approved to level D by CAD. Flight Simulator Approval will only be given if the flight simulator is representative of the aeroplane flown by the operator.

b) The flight simulator shall be serviceable according to the quality system criteria of the FSTD operator during ZFTT and/or SBT.

2. **Pilot Experience Requirements:-**

2.1. In order to qualify for undertaking the ZFTT and/or SBT leading to the grant of an aircraft type rating, the said pilot shall satisfy the following Pilot Licence and Flying Experience requirements:

a) Pilot Licence:

The pilot must hold a valid:

(i) Hong Kong Professional Pilot's Licence; or
(ii) ATPL(A) issued by an ICAO Contracting State; or
(iii) CPL with ATPL(A) ground examination passed, issued by an ICAO Contracting State;

b) Flying Experience:

The pilot must have at least 500 hours of accredited flight time (at least 250 hours of which is as PIC or P1(U/S) or equivalent or the combination of both) or 100 sectors, on a multi-pilot turbine engine aircraft with a maximum certified take-off mass of not less than 10 tonnes or a certificated passenger seating configuration of more than 19 passengers.

3. **ZFTT and/or SBT Requirements:-**

3.1. Simulator Base Training (SBT) will be conducted by an IRE/TRE qualified for SBT or ABT who must meet the qualification and recency requirements in accordance with paragraph 4.8 of this Chapter.

3.2. SBT requires the candidate to complete a minimum of 6 satisfactory take-offs and 6 satisfactory landings in a level D simulator approved for the purpose. The examiner is to occupy the other control seat.

3.3. The SBT shall encompass, but not limited to the following components:

(a) Take-off rotation technique;

(b) Approach to land, the landing flare, thrust reduction/reverse thrust technique and braking technique; and

(c) Cross wind and tail wind techniques for take-off and landing.

3.4. On satisfactory completion of the SBT, the candidate proceeds to LFUS. This LFUS requires a IRE/TRE qualified for SBT or ABT to occupy the other control seat and the candidate must complete a minimum of 4 sectors which include a minimum of 3 satisfactory take-offs and landings and 1 Pilot Monitoring (PM) sector.

3.5. The first take-off and landing must be completed within 14 days of completion of the SBT. The remaining take-off and landing manoeuvres, as stated in paragraph 6 above, shall be completed within 3 months of the completion of the SBT.

3.6. In the event of an unsatisfactory take-off or landing at any time during the LFUS, the candidate must immediately revert to PM duties only. On return to Base the said pilot shall fulfil, as a minimum, the following, or as additionally recommended by the Training Captain:

(a) Either completes a minimum of 6 satisfactory take-offs and landings in a level D simulator approved for SBT, or a minimum of 3 satisfactory take-offs and 3 satisfactory landings in ABT. All the aforementioned take-offs and landings are to be under the supervision of an IRE/TRE qualified for SBT or ABT.

(b) Completes the LFUS requirements as per paragraph 6 of this Appendix, except under the supervision of a IRE/TRE qualified for ABT, and the LFUS sectors shall be completed within 3 months of the completion of the SBT or ABT referred to in sub-paragraph (a) above.

HELICOPTER PILOT'S NIGHT QUALIFICATION CHECK (NQC)

Cancelled – refers to CAD 360 Helicopter Supplement

CHAPTER 5 - APPENDIX E

Sample Form for Proficiency Check

AIRLINE : _____ AIRCRAFT TYPE : _____

CANDIDATE NAME : _____ SIMULATOR CODE / AIRCRAFT REGISTRATION : _____

DATE : _____ AUTHORISED EXAMINER : _____

PROFICIENCY CHECK NUMBER:	1	2	3	4	5	6	3 Year Rotation

ASSESSMENT								
	Satisfactory (SAT)		Unsatisfactory (UNSAT)		Retest (SAT / UNSAT)			
Instrument Rating								
Pre-departure Checks / Use of Checklists:	☐		☐		☐	☐		
Take Off / SID:	☐		☐		☐	☐		
Enroute:	☐		☐		☐	☐		
Hold:	☐		☐		☐	☐		
ILS / MAP:	☐		☐		☐	☐		
Aircraft Rating – LHS / RHS	LHS	RHS	LHS	RHS				
V1 Cut:	☐	☐	☐	☐	☐	☐		
ILS Approach (one engine inop):	☐	☐	☐	☐	☐	☐		
MAP (one engine inop):	☐	☐	☐	☐	☐	☐		
Land (one engine inop):	☐	☐	☐	☐	☐	☐		
Note: When engine out manoeuvres are carried out in an aeroplane, the engine failure must be simulated.								
Non Precision Approach / IAL:	☐		☐		☐	☐		
LVO Procedures:	☐		☐		☐	☐		
General								
Automation Management:	☐		☐		☐	☐		
Normal Procedures:	☐		☐		☐	☐		
Non Normal Procedures:	☐		☐		☐	☐		
PNF Duties:	☐		☐		☐	☐		
TEM / CRM:	☐		☐		☐	☐		
Items in accordance with CAD 360 Part One Chapter 5 Paragraph 9.3.5(b)								
_____	☐		☐		☐	☐		
_____	☐		☐		☐	☐		
_____	☐		☐		☐	☐		
_____	☐		☐		☐	☐		

Remarks:			
Submission Details		**Management Confirmation**	
Examined By:		Confirmed By:	
I certify that _____ _____ has passed the Proficiency Check.		(1) Considering this and previous reports, I certify that _____ is competent to perform the duties of Capt*/FO*/SO*.	
Signed:		Signed:	
ATPL No:		Rank / Post:	
Date:		Date:	

* Delete as appropriate

Notes:

(1) For the initial PC this statement may also apply to Aircraft Base Training.
(2) The above 'signature blocks' are also required for the company Annual Line Check Form.

CHAPTER 5 – APPENDIX F

REVALIDATION OF THE 3-MONTH TAKE OFF AND LANDING RECENCY

1. If the pilot has not maintained **TAKE OFF and LANDING RECENCY for a period of SIX MONTHS OR LESS**, then the said pilot's recency may be re-validated by completing the following:

   (a) Completes a minimum of THREE satisfactory take offs and a minimum of THREE satisfactory landings(1) in a Simulator(2) and (3), or a minimum of THREE satisfactory take offs and a minimum of THREE satisfactory landings in ABT, either being within the period of THREE months which immediately precedes the commencement of the public transport flights.

   (b) The said pilot is accompanied by a Line Training Captain at the flying controls for the purpose of LFUS for the first take off and landing(1) and (5).

   (c) Completes a minimum of THREE take offs and a minimum of THREE landings in the aircraft(4) on Line Flying.

2. If the pilot has not maintained TAKE OFF and LANDING RECENCY for a period EXCEEDING 6 MONTHS BUT LESS THAN 12 MONTHS, then the said pilot's recency may be re-validated by completing the following:

   (a) Minimum one familiarization session in a simulator.

   (b) One Recurrent Training (RT) simulator session.

   (c) PC.

   (d) Completes a minimum of SIX satisfactory take offs and a minimum of SIX satisfactory landings(1) in a simulator(2) and (3), or a minimum of THREE satisfactory take offs and a minimum of THREE satisfactory landings in ABT, either being within the period of THREE months which immediately precedes the commencement of the PTF and under the instruction of a Training Captain authorised to conduct SBT or ABT respectively.

   (e) The said pilot is accompanied by a Line Training Captain at the flying controls for the purpose of LFUS for a minimum of THREE take offs and a minimum of THREE landings(1), (4), (5) and (6).

3. If a pilot has not maintained **TAKE OFF and LANDING RECENCY for a period of 12 MONTHS or More**, then the said pilot's recency may be re-validated by completing the following:

   (a) Sufficient simulator sessions to ensure that the pilot has completed within his 3-year cycle the items as stated in CAD 360 Part One Chapter 5 paragraph 9.3.5(b).

   (b) Items indicated at paragraphs 2(a), (b), (c) and (d) above.

   (c) The said pilot is accompanied by a Training Captain, authorised to conduct

SBT or ABT, at the flying controls for the purpose of LFUS for a minimum of THREE take offs and a minimum of THREE landings(1), (4), (5) and (6).

(d) Sufficient Aircraft LFUS to complete the Annual Line Check.

Notes: (1) A satisfactory take off or satisfactory landing in the simulator or aircraft means the candidate was in full control at all times and without major prompting or physical input to the flying controls or thrust levers by the Training Captain.

(2) Simulator means a 'simulator so approved'.

(3) The minimum specified take offs and landings in the simulator shall be completed in 'real time' between each take off and subsequent landing.

(4) The three take offs and three manual landings in the aircraft are to be completed within THREE MONTHS of the completion of the simulator or ABT sessions.

(5) One unsatisfactory take off or landing in the aircraft shall necessitate the termination of all further take offs and landings and the pilot concerned shall revert to PM duties only. On return to Base the said pilot shall complete as a minimum the requirements as outlined in paragraphs 2(d) and 3(c) above, or as additionally recommended by the Training Captain.

(6) The LFUS shall consist of a minimum of 4 LFUS sectors to include the three take offs and three landings and one Pilot Monitoring (PM) sector.

CHAPTER 5 – APPENDIX G

UPSET PREVENTION AND RECOVERY

1. **Upset Prevention Training**

1.1 Such training should:

(a) consist of ground training and flight training in an FSTD or an aeroplane;

(b) include upset prevention elements from Table 1 below for the conversion training course; and

(c) include upset prevention elements in Table 1 for the recurrent training programme at least every year, such that all the elements are covered over a period not exceeding 3 years.

TABLE 1 Elements and respective components of upset prevention training

Elements and components		**Ground training**	**FSTD/ Aeroplane training**
A.	**Aerodynamics**		
1.	General aerodynamic characteristics	•	
2.	Aeroplane certification and limitations	•	
3.	Aerodynamics (high and low altitudes)	•	•
4.	Aeroplane performance (high and low altitudes)	•	•
5.	Angle of attack (AOA) and stall awareness	•	•
6.	Stick shaker or other stall-warning device activation (as applicable)	•	•
7.	Stick pusher (as applicable)	•	•
8.	Mach effects (if applicable to the aeroplane type)	•	•
9.	Aeroplane stability	•	•
10.	Control surface fundamentals	•	•
11.	Use of trims	•	•
12.	Icing and contamination effects	•	•
13.	Propeller slipstream (as applicable)	•	•
B.	**Causes of and contributing factors to upsets**		
1.	Environmental	•	•
2.	Pilot-induced	•	•
3.	Mechanical (aeroplane systems)	•	•
C.	**Safety review of accidents and incidents relating to aeroplane upsets**		
1.	Safety review of accidents and incidents relating to aeroplane upsets	•	•
D.	**g-load awareness and management**		
1.	Positive/negative/increasing/decreasing g-loads	•	•
2.	Lateral g awareness (sideslip)	•	•
3.	g-load management	•	•
E.	**Energy management**		
1.	Kinetic energy vs potential energy vs chemical energy (power)	•	•

F.	**Flight path management**		
1.	Relationship between pitch, power and performance	•	•
2.	Performance and effects of differing power plants (if applicable)	•	•
3.	Manual and automation inputs for guidance and control	•	•
4.	Type-specific characteristics	•	•
5.	Management of go-arounds from various stages during the approach	•	•
6.	Automation management	•	•
7.	Proper use of rudder	•	•
G.	**Recognition**		
1.	Type-specific examples of physiological, visual and instrument clues during developing and developed upsets	•	•
2.	Pitch/power/roll/yaw	•	•
3.	Effective scanning (effective monitoring)	•	•
4.	Type-specific stall protection systems and cues	•	•
5.	Criteria for identifying stalls and upsets	•	•
H.	**System malfunction** (including immediate handling and subsequent operational considerations, as applicable)		
1.	Flight control defects	•	•
2.	Engine failure (partial or full)	•	•
3.	Instrument failures	•	•
4.	Loss of reliable airspeed	•	•
5.	Automation failures	•	•
6.	Fly-by-wire protection degradations	•	•
7.	Stall protection system failures including icing alerting systems	•	•
I.	**Manual handling skills** (no autopilot, no autothrust/autothrottle and, where possible, without flight directors)		
1.	Flight at different speeds, including slow flight, and altitudes within the full normal flight envelope		•
2.	Procedural instrument flying and manoeuvring including instrument departure and arrival		•
3.	Visual approach		•
4.	Go-arounds from various stages during the approach		•
5.	Steep turns		•

1.2 The recurrent training should prioritise the upset prevention elements and respective components according to the operator's safety risk assessment.

1.3 Upset prevention training should use a combination of manoeuvre-based and scenario-based training. Scenario-based training may be used to introduce flight crew to situations which, if not correctly managed, could lead to an upset condition. Relevant TEM and CRM aspects should be included in scenario-based training and the flight crew should understand the limitations of the FSTD in replicating the physiological and psychological aspects of exposure to upset prevention scenarios .

1.4 In order to avoid negative training and negative transfer of training, operators should ensure that the selected upset prevention scenarios and exercises take into consideration the limitations of the FSTD and the extent to which it represents the handling characteristics of the actual aeroplane. If it is determined that the FSTD is not suitable, the operator should ensure that the required training outcome can be achieved by other means.

1.5 **Go-Arounds from Various Stages during the Approach**

1.5.1 Operators should conduct the go-around exercises from various altitudes during the approach with all engines operating, taking into account the following considerations:

- Un-planned go-arounds expose the crew to the surprise and startle effect;
- Go-arounds with various aeroplane configurations and different weights; and
- Balked landings (between Decision Altitude and touchdown or after touchdown unless thrust reversers have been activated).

1.5.2 In addition to full thrust all engine go-arounds, operators should consider including exercises using the 'limited thrust' go-around procedure, when available. This procedure reduces the risk of the airframe structural limits being exceeded and reduces the risk of crew being exposed to somatogravic illusion and disorientation effects, thereby reducing the risk of aeroplane upsets further.

1.5.3 The go-around exercises should always be performed in accordance with the OEM procedures and recommendations.

2. **Upset Recovery Training**

2.1 Such training should:

(a) consist of ground training and flight training in an FFS qualified for the training task;

(b) be completed from each seat in which a pilot's duties require him/her to operate; and

(c) include the recovery exercises in Table 2 below for the recurrent training programme, such that all the exercises are covered over a period not exceeding 3 years.

TABLE 2 Exercises for upset recovery training

Exercises		**Ground training**	**FFS training**
A.	**Recovery from developed upsets**		
1.	Timely and appropriate intervention	•	•
2.	Recovery from stall events, in the following configurations; - take-off configuration, - clean configuration low altitude, - clean configuration near maximum operating altitude, and - landing configuration during the approach phase.	•	•
3.	Recovery from nose high at various bank angles	•	•
4.	Recovery from nose low at various bank angles	•	•
5.	Consolidated summary of aeroplane recovery techniques	•	•

2.2 The upset recovery training exercises should be manoeuvre-based, which enables flight crew to apply their handling skills and recovery strategy whilst leveraging CRM principles to return the aeroplane from an upset condition to a stabilised flight path.

2.3 The flight crew should understand the limitations of the FFS in replicating the physiological and psychological aspects of upset recovery exercises.

2.4 In order to avoid negative training and negative transfer of training, operators should ensure that the selected upset recovery exercises take into consideration the limitations of the FFS. Most current and grandfathered FFS models are deficient in representing the aeroplane in the aerodynamic stall regime, thus practising of 'full stall' in such a device could potentially result in negative training or negative transfer of training.

2.5 Stall event recovery training should emphasise the requirement to reduce the angle of attack (AOA) whilst accepting the resulting altitude loss. High-altitude stall event (i.e. conditions associated with an approach-to-stall or a stall) training should be included so that flight crew appreciate the aeroplane control response, the significant altitude loss during the recovery, and the increased time required. The training should also emphasise the risk of triggering a secondary stall event during the recovery.

2.6 Recovery from a stall event should always be in accordance with the stall event recovery procedures of the OEMs.

3. The operator should ensure that personnel providing FSTD Upset Prevention and Recovery Training (UPRT) are competent and current to deliver the training, and understand the capabilities and limitations of the device used. Please refer to ICAO Doc 10011 – Manual on Aeroplane Upset Prevention and Recovery Training for further details.

4. **Route and Aerodrome Knowledge - Environmental Knowledge Related to the Prevention of Aeroplane Upsets**

4.1 The knowledge should include understanding of:

(a) the relevant environmental hazards, such as:

- Clear Air Turbulence (CAT),
- Intertropical Convergence Zone (ITCZ),
- thunderstorms,
- microbursts,
- wind shear,
- icing,
- mountain waves,
- wake turbulence, and
- temperature changes at high altitude;

(b) the evaluation and management of the associated risks of the relevant hazards in (a); and

(c) the available mitigating procedures for the relevant hazards in (a) related to the specific route, route area, or aerodrome used by the operator.

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CHAPTER 6 - EMERGENCY AND SURVIVAL TRAINING, PRACTICE AND TESTING REQUIREMENTS FOR FLIGHT CREW AND CABIN CREW

1 GENERAL REQUIREMENTS

1.1 Statutory Requirements

Statutory requirements relating to the training and periodical testing of crews are prescribed in the Air Navigation (Hong Kong) Order (AN(HK)O).

The primary purpose of this chapter is to indicate the nature of arrangements considered necessary to secure an adequate standard of compliance with the statutory provisions.

Requirements for cabin crew acting as members of the crew of business jet / general aviation flights are to be found in Appendix B of this chapter.

1.2 Crew Co-ordination and Combined Training

1.2.1 The successful containment of aircraft emergencies depends heavily upon effective co-ordination and two-way communication between flight crew and cabin crew.

1.2.2 Operators are expected to make every effort to provide combined training for flight crew and cabin crew. Much of the training that both must receive prior to operating public transport aircraft covers common ground; paragraphs 3 (Initial Training) and 4 (Aircraft Type Training) of this Chapter specify training that all crew members must be given.

1.2.3 Additional training that cabin crew must receive is listed in paragraphs 6 and 7. Flight crew should be made aware of such additional training as is provided to cabin crew in compliance with this requirement.

1.2.4 Particular emphasis should be placed on the provision of joint practice in aircraft evacuations so that all who are involved learn of the duties other crew members must perform before, during and after the evacuation, thereby appreciating the necessity for effective two-way communications in such an emergency.

1.2.5 When combined training cannot be arranged, an operator's instructor should adopt the role of flight crew or cabin crew, as appropriate.

1.2.6 To facilitate training, it is essential that there is effective liaison between flight crew and cabin crew training departments; to promote consistency of drills and procedures, provision should be made for flight crew instructors to observe and comment on cabin crew training and vice versa.

1.3 Training Syllabus

1.3.1 A detailed emergency and survival training and testing syllabus is to be specified in the training manual. The syllabus should differentiate between initial training, aircraft type training, the annual emergency survival test and three yearly practice. The training programme shall be stated and approved by CAD.

1.3.2 ICAO Doc 10002 - Cabin Crew Safety Training Manual provides guidance related to cabin crew training requirements. This manual is developed based on a competency-based approach with the goal of ensuring the proficiency of the cabin crew members in performing their duties and responsibilities. The content of the manual is adaptable and operators should tailor it to suit their operation. If the operator is not ready for competency-based training, the training syllabus of cabin crew members assigned for duties on public transport operations should still address all relevant "competency elements" and "performance criteria" suggested in ICAO Doc 10002 as well as all other requirements detailed in this Chapter.

1.3.3 Operators should also comply with ICAO Cir 344-AN/202 with regard to education, training and reporting practices related to fume events.

1.4 Training Staff and Examiners

1.4.1 A suitably qualified person should be appointed to manage cabin safety training and testing; additionally instructors and examiners will need to be appointed to provide instruction, supervise practice and conduct tests. The practical training must be under the supervision of an instructor who has the knowledge, ability and experience to conduct such training. Details of all such appointments should be sent to the CAD not more than 14 days after the appointment becomes effective.

1.4.2 A training instructor should have a minimum of one year experience as a crew member or previous experience as safety training instructor. A training examiner should be an instructor who has an in-depth knowledge on the operator's training standards and requirements.

1.4.3 A person without the experience in as stipulated in 1.4.2 may still be considered for appointment provided adequate training and exposure to operational duties are given.

1.4.4 The training personnel conducting the instructor training must have current knowledge, ability and recent experience as an instructor and examiner. The appointment of these training personnel shall be subject to the approval of the Authority.

1.4.5 A safety Instructor / Examiner is required to:

(a) be checked by a inspector or an appointed operator's examiner every 36 months on their competency as instructor and/or examiner;

(b) carry out a minimum of three observation flight sectors on the operator's flight within the last 36 months.

1.4.6 An operator is required to maintain the following records of their instructors and examiners:

(a) training records;
(b) training classes conducted;
(c) examinations conducted;
(d) observation flights;
(e) checks as carried out by inspector or an examiner appointed by CAD.

1.5 Training and Approved Instructors and Examiners

1.5.1 Training programme for cabin crew instructors and examiners should be submitted by operator to the Authority for approval. The application should include the qualifications, experience requirements, and the proposed training programme.

1.5.2 To conduct emergency procedures training, the cabin crew instructor and examiner needs to demonstrate a wide range of skills and knowledge to be able to train cabin crew and to be able to assess their competency regarding regulatory requirements and their airlines approved training course.

1.5.3 Additionally, an instructor and examiner may well be required to train crew in several different teaching environments, including classroom, evacuation trainer, swimming pool, door trainer and aircraft. This will require a high degree of subject knowledge, instructional skills, communication skills and people management skills to be demonstrated.

1.5.4 The competency of an instructor and examiner should ensure sufficient specific competencies that all cabin crew instructors and examiner should possess, regardless of the nature of their operations. This would include a complete assessment of the following:

(a) Instructional Techniques – Classroom instruction and conducting of exams

(b) Instructional Techniques – Practical exercises, demonstration and assessment

(c) Subject knowledge

(d) Leadership / People Skills

(e) Course Administration

1.5.5 The conduct of crew training and of tests carried out by operators' instructor and examiner to be approved by CAD will be observed by appropriately qualified Inspectors to ascertain their competency.

1.5.6 An operator shall ensure that initial training and refresher training at regular interval will be provided for each cabin crew instructor which includes at least the following:

(a) Pedagogy course;

(b) Cabin Crew Induction course; and

(c) Cabin Crew Conversion and Annual Emergency Procedure Course.

1.6 Records of Training and Tests - Emergency and Survival

1.6.1 Records must be maintained to show trainees' progress through each stage of training and include information about the results of tests. Records should incorporate certificates indicating the competence of trainees to perform the duties on which they have been tested. Inspectors will advise operators on the form of records and certificates,

1.6.2 Operators must keep records for all crew members to show when practices and tests are due for renewal. There should also be an effective system to guard against crews being

rostered for duty when practices and tests are overdue. The annual emergency survival test is valid for 13 months.

1.6.3 Records of all initial, conversion and recurrent training and testing must be made available, on request, to the cabin crew member concerned.

1.7 Use and Approval of Aircraft Emergency Training Apparatus

1.7.1 Provision is made in the AN(HK)O for use of 'mock ups' for certain periodical tests. These devices must be individually approved for test purposes and may be used for such purposes only under the supervision of a person approved for that purpose. Approvals normally restrict the use of such devices to the particular operator's crews.

1.7.2 Details regarding the approval of training apparatus and the approval of personnel responsible for conducting the training and testing on this equipment are contained at paragraph 9 of this Chapter.

2 PURPOSE AND PROVISION OF TRAINING

2.1 Applicability

The requirements of this Chapter are applicable to all operating flight crew and cabin crew carried on board an aircraft.

2.2 Purpose

The purpose of emergency and survival training, practice and testing is to provide crews with the knowledge, skills and confidence needed to ensure that they deal efficiently with different types of emergency and survival situations.

2.3 Arrangements

Operators are to ensure that organised courses of instruction are given by designated instructors on the use of all emergency and survival equipment, and on all emergency procedures and drills, including aircraft emergency evacuation.

2.4 Cabin Crew - Service Duties

Cabin crew should also receive instruction in their normal flying duties, including the location and use of all cabin and galley equipment.

2.5 Training Aids

Suitable training aids will enhance the presentations in both classroom and practical instruction sessions.

2.6 First Aid Training

First aid training is to be given only by instructors qualified for the purpose. In case of doubt about the adequacy of an instructor's qualifications, the CAD should be consulted. Training is to be followed by the successful completion of the appropriate first aid test.

2.7 **Before Flying on Aircraft**

Before flying training commences on an actual aircraft, flight crew are to complete successfully the training, practice and tests described in paragraphs 3 and 4 of this Chapter.

2.8 **Supernumerary Flying**

A later stage of aircraft type training will include cabin crew flying in a supernumerary role on a passenger flight. Passengers may not be able to distinguish between such trainees and fully trained cabin crew and in an emergency may expect to receive guidance and assistance from anyone wearing a crew uniform. Operators must therefore ensure that before undertaking supernumerary duties cabin crew have successfully completed the training and testing specified in paragraphs 3, 4, 6 and 7 of this Chapter.

2.9 **Introduction of New Equipment**

Operators are to ensure that they have an established procedure for all crew to receive training and practice on any new emergency and survival equipment that is introduced.

2.10 **Inspectors**

Inspectors may wish to observe the training, practice and tests in progress.

3 INITIAL TRAINING - ALL CREW

3.1 **Introduction**

Crew are to be trained in the following subjects which are of a general nature and not necessarily related to a specific aircraft type.

3.2 **Crew Co-ordination**

Emphasis is to be placed on the importance of effective co-ordination and two-way communication between flight crew and cabin crew in various emergency situations. Cabin crew should be trained to be alert, and to identify unusual situations that might occur inside the passenger compartment, as well as any activity outside the aircraft that could affect the safety of the aircraft or its occupants. The need for effective communication of accurate information between flight crew and cabin crew must be stressed.

3.3 **Aeromedical and First Aid Topics**

3.3.1 Instruction should be given on aeromedical topics such as:

(a) first aid subjects appropriate to the aircraft type, ie its size and the number of flight crew carried;

(b) guidance on the avoidance of food poisoning, with emphasis on the choice of a pre-flight meal and the importance of the commander and co-pilot eating different food at different times during the flight, especially on long sectors;

(c) the possible dangers associated with the contamination of the skin or eyes by aviation fuel and other fluids and their immediate treatment,

(d) the recognition and treatment of hypoxia and hyperventilation; and

(e) first aid associated with survival training, appropriate to the routes operated.

3.3.2 Flight crew who operate on aircraft where cabin crew are not carried should undertake training in basic first aid that is to include the use and contents of first aid kits, and in cardiopulmonary resuscitation.

3.4 Fire and Smoke Training

3.4.1 Practical fire and smoke training must be under the supervision of an instructor who has the knowledge, ability and experience to conduct such training. Operators who have difficulty in providing the necessary facilities in respect of fire training and testing can approach the Inspector for assistance.

3.4.2 Both theoretical and practical training should be given. This is to include:

(a) an appreciation of the chemistry of fire as a preliminary to consideration of the choice of extinguishing agents for particular fire situations, the techniques of applying extinguishing agents, the consequences of misapplication and their use in a confined space;

(b) a demonstration or film of fire extinguishers being used on various types of fires. Fires should be related to typical aircraft interior equipment and include galley fires, fire in toilets, upholstery, passenger service units and electrical installations.

3.5 Water Survival Training

3.5.1 Where flotation equipment is carried, a comprehensive wet drill to cover all ditching procedures must be practised by aircraft crew. This wet drill is to include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or film of the inflation of life-rafts and/or slide-rafts. Crews must board the same (or similar) flotation equipment from the water whilst wearing a life-jacket. Training must include the use of all survival equipment carried on board flotation equipment and any additional survival equipment carried separately on board the aircraft.

3.5.2 Operators conducting intensive offshore helicopter operations will need to repeat wet drills every 2 years. Consideration should be given to the provision of further specialist training such as underwater escape training.

NOTE: Wet drill practice is always to be given in initial training, unless the crew member concerned has received similar training provided by another operator and such an arrangement is acceptable to the current employer.

3.6 Survival Training

Operators are to provide survival training, including the use of any survival equipment carried, appropriate to their areas of operation e.g. polar, desert, jungle or sea.

3.7 Human Factors

Training should address the physiological effects on the human body of flying, the problems associated with pressure change and hypoxia and the need for restrictions on underwater diving. Training should include information on flight time limitations, the effects of operating for extended periods of time and the effects of time zone changes. Operational limitations should include illness, use of alcohol and drugs, blood donations etc. Advice should be given on general health care, especially whilst operating overseas, and the need for preventative medicine such as immunisation, when operating to potentially infected areas. Guidelines for evaluating and handling passengers with suspected communicable diseases by cabin crew should be included.

3.8 Aerodrome Emergency Services

The operational procedures of ground-based emergency services at aerodromes should be discussed.

3.9 Aviation Security

Training is to be given in aspects of aviation security listed in Appendix A to this Chapter.

4 AIRCRAFT TYPE TRAINING - ALL CREW

4.1 General

Operators should ensure that comprehensive training is given on the location and use of all emergency and survival equipment to be carried on the aircraft, and that all training is related to the aircraft type, series and configuration to be operated. Aircraft type training must be given to all newly employed aircraft crew and to those who are converting to a new aircraft type.

4.2 Emergency and Survival Equipment

Training must be given in the location and use of all emergency and survival equipment together with the relevant drills and procedures. The following equipment must, if carried on board, be included:

(a) emergency exits;

(b) escape slides and, where non-self supporting slides are carried, the use of any associated ropes;

(c) life-rafts and slide-rafts, including the equipment attached to and/or carried in the raft;

(d) life-jackets, infant life-jackets and flotation cots;

(e) drop-out oxygen and its manual deployment;

(f) emergency and therapeutic oxygen;

(g) protective breathing equipment and protective clothing;

(h) fire extinguishers;

(i) fire axes;

(j) portable lights, including torches;

(k) emergency lighting systems, including floor proximity lighting systems;

(l) communications equipment, including megaphones;

(m) survival packs, including their contents;

(n) pyrotechnics;

(o) first aid kits and their contents;

(p) toilet compartment smoke detector systems;

(q) evacuation alarm systems; and

(r) non-mandatory or special equipment fitted or carried.

4.3 Fire Training

Training must be given in extinguishing a fire, representative of an interior aircraft fire using the relevant type of fire extinguisher carried on the aircraft. Emphasis is to be placed on the characteristics of different types of extinguishers, including their effective range and duration and the effectiveness of their use on differing types of fires.

4.4 Protective Breathing Equipment and Protective Clothing

On aircraft types in which it is provided, crews must be trained in the use of protective breathing equipment and protective clothing. Donning and wearing of such equipment and clothing should be practised in an enclosed, simulated smoke-filled environment.

5 RECURRENT TRAINING - ALL CREW

5.1 Refresher Training

Operators must ensure that an annual organised course of refresher training is provided for their crews; this training should prepare them for the emergency survival test. Such training will have the additional advantage of allowing crews to discuss recent incidents, difficulties and emergencies which have been experienced. If none have arisen, operators should discuss possible scenarios with emphasis on what actions should be taken. Time must be allocated for this purpose. This discussion is particularly important when cabin crew are assigned to more than one type of aircraft. First aid and aviation security refresher training must also be included (see also Appendix A).

5.2 The Annual Emergency Survival Test

5.2.1 The AN(HK)O requires that all crew shall be tested on aspects of emergency and survival appropriate to the aircraft type to be operated. The maximum period of validity of this test is 13 months. Schedule 11 makes a distinction between tests and practice, and operators should apply a similar distinction in their crew training records.

5.2.2 All crew must pass a test on their knowledge of the location and use of emergency survival equipment, and the appropriate drills and procedures. The test will be related to the aircraft type and cover every series and configuration. Appropriate written tests are required and must include first aid topics.

5.2.3 To demonstrate their proficiency in carrying out emergency duties, crew should practice - insofar as it is practicable and reasonable to do so - the actual movements and operations assigned to them in evacuation and other emergency drills. The donning of life-jackets, oxygen masks and protective breathing equipment and touch drills for opening emergency exits should be included.

5.3 Periodic Practice

Once every 3 years aircraft crew are to carry out the following practice:

(a) the operation and actual opening of all normal and emergency exits used for passenger evacuation;

(b) extinguishing a fire, representative of an aircraft interior fire, with each type of fire extinguisher carried on board the aircraft except that, in the case of Halogen extinguishers, an alternative extinguishing agent may be used; and

(c) the donning and use of protective breathing equipment by each crew member in an enclosed, simulated smoke-filled environment.

6 INITIAL TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

6.1 General

Cabin crew are to be trained in the following subjects which are of a general nature and not necessarily related to a specific aircraft type.

6.2 Discipline and Responsibilities

Operators must ensure that during cabin crew initial training, the following items are included in the cabin crew training syllabus:

(a) the importance of performing their duties in accordance with the operations manual;

(b) maintaining competence and fitness to operate as a cabin crew member with special regard to flight and duty time limitations and rest requirements;

(c) aviation regulations relating to cabin crew and the role of the CAD;

(d) the effects on the aircraft's flight path resulting from a significant redistribution of passengers in flight;

(e) basic aircraft icing, types of icing, the effects of icing on ground and in-flight operations and how to identify aircraft icing when viewed from the cabin;

(f) pre-flight briefing of cabin crew and the provision of necessary safety information with regard to their specific duties;

(g) the importance of ensuring that relevant documents and manuals are kept up to date with amendments provided by the operator;

(h) the importance of identifying when cabin crew members have the authority and responsibility to initiate an evacuation and other emergency procedures; and

(i) the importance of safety duties and responsibilities, and the need to respond promptly and effectively to emergency situations.

6.3 First Aid

Instruction should be given on first aid and the use of first aid kits, together with the application of any drugs. The following subjects should be covered:

(a) haemorrhage;

(b) wounds;

(c) fractures, including dislocation and sprains;

(d) burns;

(e) care of the unconscious;

(f) shock;

(g) heart attacks;

(h) stroke, epilepsy, diabetes;

(i) artificial respiration and cardiopulmonary resuscitation;

(j) use of therapeutic oxygen and oxygen sets;

(k) poisoning;

(l) emergency childbirth;

(m) choking;

(n) stress reactions and allergic reactions;

(o) air sickness; and

(p) asthma.

NOTE: In order to complete satisfactory practical training in artificial respiration and cardiopulmonary resuscitation, cabin crew must use a dummy specifically designed for the purpose.

6.4 Fire and Smoke Training

It is particularly important that cabin crew should be given theoretical and practical training in dealing with emergency situations involving fire and smoke in the cabin. The training is to include:

(a) the responsibility of cabin crew to deal promptly with emergencies involving fire and smoke. Emphasis should be placed on the importance of identifying the actual source of the fire;

(b) the importance of informing the flight crew immediately fire or smoke is discovered and of keeping them informed as the situation develops. The importance of crew co-ordination and communication is to be emphasised, together with an established procedure for communicating with the flight deck;

(c) the importance of ensuring that passengers are aware of no smoking areas and obey no smoking signs. Emphasis is to be placed on the frequent and systematic checking of toilets (including smoke detectors) and other areas which are not part of the seating accommodation;

(d) a demonstration or film is required of fire extinguishers being used on various types of fires. Fires are to be related to typical aircraft situations including fires in galleys, toilets, upholstery, passenger service units and electrical installations.

6.5 **Abusive Passengers**

Operators are to give advice to cabin crew on the management of passengers who become abusive; this often arises from excessive consumption of alcohol or the effects of medication/drugs, or a combination of both.

6.6 **Seat Allocation**

Cabin crew are to be given training on the importance of correct seat allocation with particular emphasis on the seating of disabled passengers and the necessity of seating able-bodied passengers adjacent to unsupervised exits.

6.7 **Prohibited Items and Dangerous Goods (DG)**

Cabin crew should be given training in aspects of the carriage of prohibited items and DG. DG training must comply with the requirements specified in the current edition of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air.

6.8 **Flight Time Limitations**

Cabin crew must be made familiar with the company flight time limitations scheme and the statutory requirements regarding crew fatigue.

6.9 **Crew Resource Management (CRM) Training**

6.9.1 Operators must provide initial and recurrent CRM training for all cabin crew. Cabin crew training should be combined, as far as practible, with flight crew training, to promote awareness of flight crew management of various emergency situations and the consequential effects on aircraft operation.

6.9.2 Combined training should include practice in aircraft evacuation and joint discussion of emergency scenarios. Wherever practible, SCCMs should participate in flight simulator Line Orientated Flying Training (LOFT) exercises.

6.9.3 Emphasis should be placed on the importance of effective co-ordination and two-way communication between flight and cabin crew in various abnormal and emergency situations. Emphasis should also be placed on co-ordination and communication within the crew in normal operational situations including the use of correct terminology, common language and effective use of communications equipment.

6.9.4 Cabin crew should be trained to identify unusual situations that might occur inside the passenger compartment, as well as any activity outside the aircraft that could affect the safety of the aircraft and/or passengers.

6.9.5 There should be effective liaison between flight and cabin crew training departments, and provision should be made for flight and cabin crew instructors to observe and comment on each others' training.

6.10 **Senior Cabin Crew Member (SCCM) Training**

Senior Cabin Crew Members should be given additional training on the following topics:

(a) items to be covered at pre-flight briefing of the operating cabin crew including:

(i) allocation of cabin crew stations and responsibilities;

(ii) aircraft type and equipment fit;

(iii) area, route and type of operation e.g. ETOPS; and

(iv) any special category passengers such as infants, disabled or stretcher cases etc.

(b) co-operation within the crew:

(i) discipline, responsibilities and chain of command;

(ii) importance of co-ordination and communication; and

(iii) action in the event of pilot incapacitation.

(c) review of legal and operator's requirements:

(i) passenger safety briefing , safety cards;

(ii) securing of galleys;

(iii) stowage of Cabin baggage;

(iv) restrictions on use of portable electronic equipment;

(v) procedure during turbulence;

(vi) procedures when fueling with passengers on board; and

(vii) documentation.

(d) Human Factors and Crew Resource Management, including participation in flight simulator LOFT exercises if practicable;

(e) accident and incident reporting; and

(f) flight and duty times limitations and rest requirements.

7 AIRCRAFT TYPE TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

7.1 Practical training

7.1.1 The following is the minimum level of training necessary to satisfy the relevant requirements for cabin crew aircraft type training:

(a) during ditching and evacuation drills, each trainee operates and actually opens all normal and emergency exits; removes and positions for use at least one escape rope; attaches escape slide fittings in their proper places; descends an escape slide from a height representative of the aircraft main deck sill height (not required for subsequent type training unless sill height is significantly higher); locates and operates the megaphone; and removes life-rafts from stowages and positions in the launching area. Additionally, the trainee must demonstrate the ability to locate and remove from stowage the aircraft first aid kits and hand fire extinguishers;

(b) each trainee observes a practical demonstration of an escape rope being used as a means of emergency evacuation; the inflation or release, as applicable, of an escape slide; inflation of a life-raft; the survival equipment contained in the life-raft; the contents of the first aid kits; administering supplemental crew and passenger oxygen by portable equipment;

(c) each trainee observes demonstrations of the use of the type of fire extinguishers carried on the aircraft on various types of fire including simulated galley, electrical and cabin furnishing fires. The demonstration should also show the effect of misapplication of agents;

(d) each trainee handles and uses each type of fire extinguisher carried on the aircraft;

(e) each trainee observes the inflation of an infant flotation cot;

(f) each trainee practices the donning of oxygen masks carried in the aircraft; and

(g) each trainee is familiarised with the use of the aircraft PA and interphone system.

7.2 Evacuation Procedures and Emergency Situations

7.2.1 Emergency evacuation training is to include the recognition of particular types of emergency situations. Cabin crew will also need to recognise when exits are unusable or when evacuation equipment is unserviceable and to act accordingly to overcome these problems. Circumstances might arise, such as the incapacitation of the flight crew, where these drills might need to be initiated by cabin crew.

7.2.2 Cabin crew are to be trained to deal with the following specific emergency situations:

(a) an unpremeditated emergency on take-off or landing, including a ditching;

(b) a pre-warned emergency landing or ditching;

(c) an in-flight fire, with particular emphasis on establishing the fire source;

(d) sudden decompression, including the donning of portable oxygen equipment; and

(e) severe turbulence.

7.3 **Crowd Control**

7.3.1 Operators are to provide comprehensive training in the practical application of all aspects of crowd control in various emergency evacuation situations. Training is to emphasise the need for cabin crew to be assertive and, at times, aggressive during an emergency evacuation. Scenarios must be as realistic as possible and should include, as a minimum:

(a) communications between flight crew and cabin crew and use of all communications equipment, including the difficulties of co-ordination in a smoke-filled environment;

(b) verbal commands;

(c) the physical contact that may be needed to encourage people out of an exit and on to a slide;

(d) the re-direction of passengers away from unusable exits;

(e) the marshalling of passengers away from an aircraft;

(f) the evacuation of disabled passengers; and

(g) authority and leadership.

7.3.2 The executive order to initiate an emergency evacuation is to be given by the Senior Cabin Staff Member in English ('Evacuate, Evacuate') and in Cantonese ('Saw Sarn, Saw Sarn'). Other cabin crew should repeat the order in their native language where passenger demography so requires.

7.4 **Pilot Incapacitation**

Where the flight crew consists of only 2 pilots, cabin crew are to be given training in recognising the signs of subtle incapacitation and practice the ways in which they can be of help in the event of pilot incapacitation. This should include:

(a) use of the pilot's oxygen equipment;

(b) familiarity with the location and method of use of pilot checklists;

(c) fastening and unfastening pilots' seat harness and, in the case of inertia reel harness, locking and unlocking the inertia device; and

(d) using pilots' sliding seat mechanism; training is to be given with the seat occupant simulating physical collapse. Emphasis is to be placed on 'locking' the pilot in his seat rather than on removing him from the seat, which may not in the event be possible.

7.5 Passenger Briefings

7.5.1 Training and practice is to be given in the pre-flight briefing of passengers in normal and emergency situations, including emergency landings, ditching and turbulence. Training is also to include the in-flight briefing for the pre-warned emergency landing and ditching, demonstrating the brace position and the briefing of able-bodied passengers on how to operate exits.

7.5.2 Briefings are to be given in English and Chinese (the language of Chinese can be either Cantonese or Mandarin, as justified by the operator and with the concurrence from CAD) and may include another language where passenger demography so requires. Where audio-video presentation is utilised, the audio text is to be in English and Chinese (promulgated as aforesaid) with each text accompanied by synchronised Chinese (traditional) characters and English sub-titles respectively.

7.6 Cabin Baggage and Cabin Clutter

Cabin crew are to be instructed that cabin baggage, service items and other objects are only to be stowed in approved areas such that they are restrained against forward, lateral and vertical movement. They must not be stowed in such a way as to obstruct or damage emergency equipment or exits. Training is to include the areas of the cabin that are approved for the stowage of cabin baggage or other items and the areas where it would be unsafe to do so.

7.7 Brace Positions

Training and practice is to be given in the correct brace positions for both cabin crew and passengers. Such training must take into account different seating configurations and orientation.

7.8 Supernumerary Sectors

On completion of emergency and survival training and prior to operating as a required crew member, cabin crew must operate a minimum number of supernumerary or "under supervision" sectors on each aircraft type. The minimum number must be agreed with the CAD. The supernumerary cabin crew is required to be in addition to the normal crew complement.

8 RECURRENT TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

8.1 The Annual Emergency Survival Test

Cabin crew should show a satisfactory knowledge of crowd control techniques, if applicable, and of their role in the event of pilot incapacitation. Cabin crew should also undertake first aid refresher training and pass an appropriate written test.

8.2 Periodic Practice

Cabin crew are to carry out the following practice once every three years:

(a) pilot incapacitation drills, as specified at paragraph 7.4 of this Chapter; and

(b) practical training in artificial respiration and cardiopulmonary resuscitation using a dummy specifically designed for the purpose.

9 APPROVAL OF AIRCRAFT EMERGENCY TRAINING APPARATUS AND OF PERSONNEL CONDUCTING TRAINING AND TESTING WITH SUCH APPARATUS

9.1 Operators may wish to conduct some of their emergency training and testing on training apparatus rather than on an actual aircraft, in accordance with Schedule 11, Part B 1. (1)(b) of the AN(HK)O. Where this is the case, the apparatus and the persons controlling the apparatus must be formally approved by the CAD.

9.2 Operators wishing to obtain approval for their apparatus and personnel should apply through their assigned Inspector to arrange an inspection. Upon satisfactory conclusion of the inspection, an approval will be issued. Renewal of the approval will be by similar inspection.

9.3 If it is proposed to use the apparatus for all practical emergency survival training and testing, it will need to meet all the items in paragraph 9.4. However, approval may be sought and given for limited use of apparatus, in which case only the relevant items need be met.

9.4 Subject to the proviso in paragraph 9.3, the apparatus should accurately represent the aircraft in the following particulars:

(a) layout of the cabin in relation to exits, emergency exits, galley areas and safety equipment stowage; dimensions should be an accurate representation typical of aircraft in the fleet;

(b) both cabin crew and passenger seat positioning - with particular accuracy where these are immediately adjacent to exits;

(c) seat dimensions and seat pitch;

(d) operation of exits and emergency exits in all modes of operation particularly in relation to method of operation and weight and balance;

(e) extent of movement and associated forces of all controls for all equipment and services;

(f) provision of emergency equipment of the type provided in the aircraft;

(g) all cabin markings;

(h) all cabin lighting;

(i) cabin crew communications equipment and associated control panels;

(j) evacuation slides, including normal and standby methods of operation; and

(k) height and angle of inflated evacuation slides.

9.5 Operators should nominate training personnel to be approved by the CAD for the control of training apparatus. Operators must satisfy themselves that nominated personnel have the qualifications and experience to conduct such training and that they have undergone a period of training which the assigned Inspector may wish to observe. All approved training personnel should be so nominated in the company training manual.

9.6 An operator may arrange to use the apparatus and/or personnel of another operator. A separate approval will be required in such cases. The training given must comply with the training manual and operating procedures of the operator whose crews are being trained and items covered in the apparatus may be restricted, if significant differences of cabin layout and equipment exist.

CHAPTER 6 APPENDIX A - AVIATION SECURITY TRAINING PROGRAMME - ALL CREW

1. Training Programmes

1.1 Operators of Hong Kong registered aeroplanes shall establish and maintain an approved security training programme which ensures crew members act in the most appropriate manner to minimize the consequences of acts of unlawful interference. As a minimum, this programme shall include the following elements:

a) determination of the seriousness of any occurrence;

b) crew communication and coordination;

c) appropriate self-defense responses;

d) understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;

e) live situational training exercises regarding various threat conditions;

f) flight deck procedures to protect the aeroplane;

g) aeroplane search procedures and guidance on least-risk bomb locations where practicable; and

h) post-incident concerns for crew.

1.2 Operators conducting helicopter operations shall establish and maintain a training programme to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on a helicopter so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

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CHAPTER 6 – APPENDIX B – BUSINESS JET / GENERAL AVIATION – CABIN CREW TRAINING

1 GENERAL

1.1 Under current legislation, aircraft registered in Hong Kong having 35 seats or less and carrying less than 20 passengers, flying for the purpose of public transport, are not required to have on board cabin crew for the purposes of performing duties in the interests of the safety of passengers. However, it is CAD policy that where cabin crew are boarded as members of the crew of such aircraft, operators are to ensure that these cabin crew receive training, both initial and recurrent, in the use of safety and medical equipment specific to their aircraft.

1.2 Crew Co-ordination

As with aircraft carrying a greater number of passengers/seats, business jets and those of a similar category depend heavily upon well-integrated communication between the whole crew to effectively contain an aircraft emergency. Cabin crew are to be aware of the role that they can play in the bringing such an event to a successful conclusion. Aircraft safety training sessions should include, where possible, the whole crew.

1.3 Health and Safety

The dangers inherent in many training situations should be well recognised by training staff and should be taken into account in the formulation and execution of training.

1.4 Training Syllabus

A syllabus which covers familiarity with, and the use of, the equipment to be found on board the specific aircraft, along with those topics generally applicable to an aviation environment, should be specified in the appropriate manual. The syllabus should cover induction and new-to-type training, as well as annual recurrent training.

1.5 Training Staff

Appropriately qualified staff should be chosen to act as training facilitators. Each should be a qualified crewmember on the aircraft type upon which they are instructing. On appointment an inspector will observe a training session in order to approve that appointment.

1.6 Records of Training and Tests

Records of all training and tests for each individual crewmember must be maintained and available for periodic inspection by CAD staff. Initial and new-to-aircraft training must be successfully completed prior to the first flight for the purpose of public transport in the aircraft. Recurrent training should be undertaken within 13 months of the previous qualification.

1.7 Use of Training Aids

The impracticability for companies in this category to provide aircraft-type 'mock-ups' is acknowledged by the CAD. Recognised aids which adequately fulfil the training requirement, would be acceptable to the CAD. This could include, but not be limited to, video and multimedia presentations and instructor briefing. Companies are encouraged, however, to utilise a dedicated training department where possible.

2 PURPOSE AND PROVISION OF TRAINING

2.1 Purpose

The purpose of emergency and survival training, practice and testing is to provide crews with the knowledge, experience and confidence to deal effectively with emergency and survival situations that could possibly be encountered.

2.2 First Aid Training

First aid training is to be given only by instructors qualified for the purpose.

3 INITIAL TRAINING – ALL CREW

3.1 Introduction

Crews should be acquainted with those physiological conditions which could possibly be encountered in the course of a flight. In addition, they should be experienced in use of the safety equipment to be found on their aircraft and the uses and limitations of such equipment.

3.2 Aeromedical and First Aid Topics

Cabin crew should have an awareness of basic aeromedical situations, including such aspects as the symptoms and treatment of hypoxia, hyperventilation, cardiac arrest, etc. In addition, they should have training in simple first aid techniques. Practical training, including the use and the limitations of both portable and fixed oxygen systems in the aircraft must be experienced, as well as familiarity with the contents and use of the aircraft first aid kit.

3.3 Fire Fighting Training

Recognition of the type of fire, choice and use of fire fighting equipment should be taught, including the inappropriate nature of certain types of fire extinguisher with certain types of fire, in addition to the knowledge of the isolation of equipment in the case of an electrical fire. The absolute need for continual liaison with cockpit crew in the situation of a cabin fire must be emphasised.

3.4 Aircraft Evacuation and Survival Equipment

Cabin crew must be conversant with the means by which passengers may be evacuated from the aircraft, both via emergency exits and through aircraft entry doors, and with all equipment related to evacuation. Where possible, removal of emergency exits should be experienced on initial training. Where liferafts are carried as permanent aircraft equipment, cabin crew should have instruction upon from where, and how, they are launched and the purposes and use of the safety equipment carried on board the rafts.

3.5 Pilot Incapacitation

Training in the identification of pilot incapacitation and the actions to be taken in such a situation must be given. This should include use of related equipment in the cockpit and the ability to secure the incapacitated pilot and the function of the pilot's seat controls. Practice in reading the cockpit checklist and its facilitation should be given.

4 RECURRENT TRAINING

4.1 All flight crew, including cabin crew, should undergo Aircraft Emergency Procedures training (AEP) on a recurrent basis. This should be done at not more than 13 month intervals and, as in the case of initial and new-to-type training, culminate in an examination. Records of such training and the results of examinations should be kept for the perusal of the CAD.

4.2 Activities such as the opening and removal of an emergency exit and the hands-on use of fire extinguishers should be carried out every three years.

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CHAPTER 7 - CABIN SAFETY

1 CABIN CREW

1.1 Age/Medical Requirements

1.1.1 A cabin crew member should be at least 18 years of age and have passed an initial medical examination or assessment and been found medically fit to discharge the duties specified in the operations manual. An operator must ensure that cabin crew members remain medically fit to discharge such duties.

1.1.2 The initial medical examination or assessment, and any re-assessment, of cabin crew members should be conducted by a medical practitioner registered in Hong Kong. However, when necessary, the final authority rests with a Hong Kong AMA.

1.1.3 The following medical requirements are applicable to cabin crew members:

(a) good general health;

(b) freedom from any physical or mental illness which might lead to incapacitation or inability to perform cabin crew duties;

(c) normal cardiorespiratory function;

(d) normal central nervous system;

(e) adequate visual acuity - 6/9 with or without glasses;

(f) adequate hearing; and

(g) normal function of ear nose and throat.

1.2 Senior Cabin Crew members

1.2.1 Whenever more than one cabin crew member is carried on a flight, the operator must nominate a senior cabin crew member. The senior cabin crew member will be responsible to the commander for the conduct and co-ordination of the cabin safety and emergency procedures specified in the operations manual.

1.2.2 An operator shall not appoint a person to the post of senior cabin crew member unless that person has at least one year's experience as an operating cabin crew member and has completed an appropriate course of training.

1.2.3 An operator shall establish procedures to select the next most suitably qualified cabin crew member to operate as senior cabin crew member in the event of the nominated senior cabin crew member becoming unable to operate. Such procedures must be acceptable to the CAD and take into account the cabin crew member's operational experience.

1.3 Cabin Crew Complement

1.3.1 It is incumbent on operators to ensure that passenger-carrying public transport aircraft do not fly with lesser numbers of cabin crew than the law prescribes. Furthermore, minimum numbers specified in operations manuals should take full account of all the factors detailed below.

1.3.2 Required Complement

The complement specified will be that calculated in accordance with Article 18(7)(c) of the Air Navigation (Hong Kong) Order 1995, or for wide bodied aircraft one Cabin Crew member per door that is designated an Emergency Exit, whichever is the higher. In exceptional circumstances the complement may be reduced and will become that specified in a Permission granted in accordance with the provision to Article 18(7).

1.3.3 Minimum Complement

The minimum complement specified in the operations manual will be not less than the required complement but may be greater. Factors that should be taken into account when calculating the minimum complement will include:

(a) the number of exits;

(b) the type of exits and their associated slides;

(c) the location of exits in relation to cabin crew seats and cabin layout;

(d) the location of cabin crew seats taking into account cabin crew duties in an emergency evacuation including:

  (i) opening floor level exits and initiating stair or slide deployment;

  (ii) assisting passengers to pass through exits; and

  (iii) directing passengers away from inoperative exits, crowd control and passenger flow management.

(e) actions required to be performed by cabin crew in ditching emergencies, including the deployment of slide-rafts and the launching of life-rafts; and

(f) the number of crew who actively participated in the cabin during the emergency evacuation demonstration for aircraft certification.

NOTE: Having regard to all the considerations listed above, the minimum acceptable complement of cabin crew will, in most circumstances, be not less than one cabin crew to serve every floor level exit. This number might not always be appropriate, for example, where the position of floor level exits in a cabin is such that it enhances the importance of non floor level exits e.g. overwing exits, when consideration should be given to seating cabin crew adjacent to the latter. Also, this number could even be excessive; for example when, as on some narrow-body aircraft, two floor level exits are very close together it is reasonable to expect one cabin crew to open both exits and initiate stair or slide deployment in turn before assisting evacuation from both simultaneously.

1.3.4 Normal Complement

The normal complement will be not less than the required complement and may be greater than the minimum complement. Its use would be to guide rostering staff to crew the cabin to a level required to provide a service to passengers that could not be achieved with lesser numbers.

1.3.5 When scheduling cabin crew for flights, rostering procedures should take account of the experience of each cabin crew member such that the required cabin crew includes some cabin crew members who have at least three months operating experience as a cabin crew member.

1.3.6 If operators should seek alternative solutions, it will be for them to satisfy the CAD that such lesser numbers of cabin crew as they wish to specify are so positioned throughout the aircraft and have such drills specified that they can reasonably be expected to manage any cabin emergency that might arise. In circumstances such as these, operators should pay particular attention to ensuring that cabin crew who have least experience of working in the aircraft or with the operator are paired with those who are well experienced.

1.4 Operation on more than One Type or Variant

1.4.1 Cabin crew may not normally operate on more than three aircraft types except that, with the agreement of the CAD, they may operate on four types provided that safety equipment and emergency procedures for at least two of the types are similar.

1.4.2 For the purposes of paragraph 1.4.1, variants of a particular aircraft type are considered to be different types if they are not similar in all of the following aspects:

(a) emergency exit operation;

(b) location and type of safety equipment; and

(c) emergency procedures.

1.5 **Recency**

1.5.1 An operator shall ensure that any cabin crew member who has been absent from all flying duties for more than six months completes refresher training as specified in the operations manual. The training shall include at least the requirements listed in paragraph 1.6.

1.5.2 An operator shall ensure that any cabin crew member who has not, during the preceding six months, operated on a type or variant, before undertaking duties on that type either:

(a) completes refresher training on the type; or
(b) operates two sectors under supervision.

1.6 **Training**

An operator shall ensure that initial training (and refresher training at regular intervals) will be provided for each cabin crew member which includes at least the following:

(a) emergency procedures including pilot incapacitation;
(b) evacuation procedures including crowd control techniques;
(c) the operation and actual opening of all normal and emergency exits for passenger evacuation in an aircraft or approved training device;
(d) demonstration of the operation of all other exits;
(e) the evaluation and handling of passengers with suspected communicable diseases; and
(f) the location and handling of emergency and life-saving equipment, including oxygen systems, portable oxygen, protective breathing equipment, the donning of life-jackets, the use of first aid and, if carried onboard, universal precaution kit in case of suspected communicable disease.

NOTE: Requirements on the types, number, location and contents of the medical supplies (including first-aid kits, universal precaution kits and a medical kit) are available in Hong Kong Airworthiness Notice No. 101E (http://www.cad.gov.hk/english/HKAN.html).

1.7 **Uniforms**

1.7.1 Operators should provide crew uniforms which readily distinguish the wearer as a member of cabin crew. Uniforms should, whenever practicable, be manufactured from non-thermoplastic material, such as wool; particular attention should be paid to uniform linings and melt factors.

1.7.2 Protective clothing for at least two crew members, such as a quick donning jump suit manufactured from a non-thermoplastic material, should be provided for aircraft being operated in a combined passenger and cargo role, i.e., Class 'B' compartments.

1.7.3 Care should be exercised in the provision of cabin crew's footwear. Appropriate shoes should be worn during take-off and landing, to cater for possible emergency situations etc., so as to avoid damage to slides.

1.7.4 All chains worn around the neck and unconcealed by clothing have the potential to snag and so hamper movement. At worst they can be a cause of injury to the wearer. Both the restriction of movement and the risk of injury that may occur when neck chains are worn have the potential to inhibit crews from carrying out their duties. Operators must therefore instruct crews to remove unconcealed neck chains when on board aircraft. If there is a requirement that ID cards must be displayed, other forms of attachment must be used, care being taken to ensure that this does not result in loose chains continuing to present a risk of snagging.

2 CABIN SAFETY MANAGEMENT

2.1 Pre-departure Procedures

2.1.1 Operators should establish check-in and boarding gate procedures and, where applicable, training for their traffic staff and handling agents. Emphasis should be placed on the need for these personnel to identify and resolve potential difficulties in seat allocation (see also paragraphs 2.2 and 2.3), excess cabin baggage, the carriage of dangerous goods, drunken or unruly passengers, including boarding refusal, before passenger embarkation begins. This is of particular importance at overseas departure points.

2.1.2 Similar instructions and training should also be given to cabin crew to deal with problems which may have been missed at check-in.

2.2 Seat Allocation

2.2.1 No persons shall be seated where they could obstruct emergency exits, impede the crew in their duties, obstruct access to emergency equipment or hinder aircraft evacuation.

2.2.2 Operator shall conduct risk assessment under its Safety Management System in order to establish and incorporate associated policies and procedures into its Operations Manual as described in paragraph 2.2.1 above. Operators are reminded that any corresponding changes to CAD accepted Operations Manual shall be re-submitted, together with the risk assessment, for CAD's consideration.

Note: Guidance on seat allocation for Persons with Reduced Mobility (PRM) in Air Travel is contained in CAD 800.

2.3 Seat Allocation at Self-help (Types III and IV) Exits

2.3.1 Seats which form the access route from the cabin aisle to these exits shall only be allocated to passengers who appear capable of operating and/or assisting with the operation of the exit; check-in staff should identify likely candidates for these seats.

2.3.2 On no account should the types of persons identified by the Operator, as stipulated in paragraph 2.2, be allocated with seats which form the access route from the cabin aisle to these types of exit. Preference should be given, where possible, to seating non operating crew at these locations.

2.4 Drunken Passengers

2.4.1 Article 49 of the AN(HK)O states that "A person shall not enter any aircraft when drunk or be drunk in any aircraft".

2.4.2 Operators are to provide instructions, advice and training to all relevant staff on dealing with passengers who have been drinking excessively. Such advice should include when to deny boarding rights and reiterate the commander's prerogative to exercise the powers, as conferred by the AN(HK)O, to protect the safety of the aircraft and passengers.

2.4.3 Drunken passengers constitute not only a possible source of annoyance to fellow passengers but also a hazard to flight safety. Potentially hazardous incidents should be reported through the MOR scheme.

2.5 Stowage of Cabin Baggage

2.5.1 Cabin baggage may only be stowed in approved locations. Operators should provide clear and unequivocal advice on which areas are approved.

2.5.2 Overhead lockers and other stowages must be clearly placarded with weight limitations and enclosed by latched doors or load bearing nets as appropriate; cabin crew must be made aware of the need to ensure that limitations are not exceeded.

2.5.3 Underseat stowages may only be used if the seat is equipped with a restraint bar and the baggage is of a size to fit under the seat.

2.5.4 Baggage must not be stowed in toilets, immediately forward or aft of bulkheads, or in such a manner that it will impede access to emergency equipment. Particular attention must be paid to maintaining the integrity of all evacuation routes.

2.6 Stowage of Catering Supplies and Crew Effects

2.6.1 All catering supplies, blankets, pillows, newspapers etc. are to be securely stowed in approved areas for take-off and landing.

2.6.2 Similarly, crew effects, including baggage and clothing, must be stowed in approved areas. Particular care must be taken to ensure that doors and exits, including operating handles, are not obstructed nor ready access to emergency equipment precluded.

2.7 Carriage of Aerosols

2.7.1 Advice and instructions should be provided to crew on the carriage of aerosols. In particular, the potential fire hazard posed, and how this may be obviated by careful stowage should be emphasised.

2.7.2 Unless it is unavoidable, aerosols should not be used for dispensing air fresheners, insecticides or other similar agents.

2.8 Portable Electronic Equipment

2.8.1 The CAD has considered evidence that navigation equipment may malfunction as a result of interference from passengers' portable electronic equipment. At the request of the commander, cabin crew may be required to check the cabin for portable electronic equipment being used by passengers.

2.9 Spillage of Drinks

2.9.1 There is an obvious potential for a major incident to occur when such items as conductive liquids in open containers, cutlery etc are mishandled on aircraft flight decks. All operators are requested to review their procedures for handling drinks and other items in and around the flight deck, as appropriate. Clear advice should be given to all crew on how best to route drinks when passing them about, so as to avoid any risk of accidental spillage on to electrical equipment

2.10 Security of Flight Crew Compartment

2.10.1 Operational procedures must be in place to prevent unauthorized persons from entering the flight crew compartment. Particular attention must be paid to entering and exit procedures, monitoring of door area, and procedures for crew leaving the flight crew compartment.

2.10.2 In all aeroplanes which are equipped with an approved flight crew compartment door that is designed to resist penetration by small arms fire and grenade shrapnel, and to resist forcible intrusions by unauthorised persons and is capable of being locked and unlocked from either pilot's station, this door shall be closed and locked from the time all external doors are closed following embarkation until any such door is opened for disembarkation, except when necessary to permit access and egress by authorised persons. Operators shall provide clear definition of "authorised persons" in the operations manual.

2.10.3 Operators shall also establish a policy and procedures with regard to cabin crew notification to flight crew in the event of suspicious activity or security breaches in the cabin.

3 SAFETY BRIEFING

3.1 Passenger Briefing

3.1.1 Passengers are to be given a pre-departure briefing, without distraction by other cabin activities. The briefing should cover all relevant points appropriate to the aircraft type and operation being undertaken. The following points must be pointed out by demonstration or video:

(a) seat belt operation;

(b) location of emergency exits, including any unserviceabilities;

(c) life-jacket operation, where required; and

(d) operation of drop-out oxygen, where required.

Passengers' attention must be drawn to smoking restrictions; when appropriate, the availability of infant life-jackets and flotation cots; the need for children's and babies oxygen masks to be fitted after those of their accompanying elders; and advice on wearing seat belts at all times.

3.1.2 The location of floor lighting systems must be included in the briefing and, where possible, the system should be activated for a few seconds.

3.1.3 Passengers' attention should be drawn to the safety card and mention made of the instructions for operating types III and IV exits, if appropriate.

3.1.4 Attention should also be drawn to restrictions on the use of personal electronic equipment, including mobile telephones; this is to be repeated prior to landing.

3.1.5 Where briefings are given by the use of a video presentation, cabin crew must monitor screens to ensure that each passenger receives a full briefing and, particularly with larger aircraft, physically indicate the nearest available exit. Where passengers have not, or cannot (because of location), received a full briefing by video, individual briefings must be given.

3.1.6 Operators should ensure that their crew drills include a procedure for passengers to be warned of impact so that they can adopt the brace position at the appropriate time before impact.

3.2 Passenger Safety Cards

3.2.1 The passenger safety briefing must be supplemented with a pictorial safety notice relevant to the type of aircraft and its safety equipment (passenger safety card). Information contained in the card must be consistent with the briefing. A copy of each card currently in use must be lodged with the Inspector.

3.2.2 The card is to be designed and produced as an entity separate from any other literature. It should be located so that the seated passenger can readily see and identify it; a distinctive message that it contains safety information should be placed at the top of the card.

3.2.3 Equipment and operating methods should be depicted pictorially, using internationally recognised symbols wherever possible. Any wording, which should be kept to a minimum, is to be in English with equivalent Chinese characters.

3.2.4 Passenger safety cards must provide the following information:

(a) seat belts - instructions for fastening, adjusting and unfastening;

(b) exit location - routes to exits should be indicated;

(c) exit operation - for all types of exit fitted. Illustrations should depict a person operating the exit with the direction of the movement of handles clearly indicated;

(d) use of evacuation slides - depicting the correct method of use, the manual inflation handle and discarding high heeled shoes;

(e) brace positions - for all types of seat orientation and pitch in use on the aircraft;

(f) oxygen masks - instructions on locating, donning and adjusting the mask; initiating oxygen flow. Instructions should be given that masks should be fitted to children only after their guardians have fitted their own;

(g) life-jackets - removal from stowage, removed from container and inflation. The card must show that, excepting children, the life-jacket must not be inflated within the cabin; and

(h) life-rafts - location, removal, preparation for use. inflation and launching. Launching locations should be indicated.

Additionally, operators may wish to include the following:

(i) Smoking - restrictions;

(j) Seatbacks and trays - upright and stowed for take-off and landing; and

(k) Emergency floor path lighting systems.

4 CABIN CREW DUTIES

4.1 Pre-flight Briefings

Cabin crew should be given a safety briefing prior to the commencement of any flight and, in a series of consecutive flights, after each full rest period. Consideration should be given to the following:

(a) areas dedicated to pre-flight briefing usage that afford privacy should be provided;

(b) copies of the relevant cabin safety manual and current safety notices must be available;

(c) all cabin crew present should be required to answer satisfactorily at least one question on aircraft safety (emergency drills, safety equipment location and usage) or one on first aid;

(d) the allocation of cabin crew to specific seats in the passenger compartment, where applicable, should take due account of the need to ensure that no area is devoid of persons who have experience in the conduct of safety-related duties;

(e) safety 'reminders' that address any recent changes to safety-related issues or any perennial problems should be given; and

(f) action to be taken by the Senior Cabin Crew Member (SCCM), if it becomes apparent that any crewmember displays inadequate knowledge of safety-related issues.

4.2 Allocation of Cabin Crew Stations

4.2.1 General

Arrangements should be made, preferably during rostering, to ensure an even spread of experienced cabin crew through the aircraft. SCCMs should allocate duties and positions on the day with this in mind. The SCCM must occupy an approved crew seat for all take-offs and landings.

4.2.2 Senior Cabin Crew Member Seating

When the assigned crew station of the SCCM does not allow immediate access to the flight deck, operators must specify drills which reflect the following:

(a) the cabin crew seated closest to the flight deck should be responsible for communicating with the flight deck crew in the event of any emergency on take-off or landing; and

(b) emergency evacuation procedures should require the SCCM to remain at his or her station and to control and operate the emergency exits.

4.3 **Embarkation and Disembarkation of passengers**

Instructions should be available to crews for marshalling of passengers at stations where ground handling staff are unavailable.

4.4 **Arming and Disarming Slides**

Slides should be armed as soon as obstructions to their deployment (steps, jetties etc) are removed and clear. Slides should remain armed after landing until arrival 'on stand'. Crews should be aware of the dangers of accidental deployment.

4.5 **Duties Prior to Take-off and Landing**

4.5.1 Cabin crew carried in accordance with AN(HK)O requirements should remain at their stations with harnesses fastened, except when performing duties related to the safety of the aircraft and its passengers.

4.5.2 All catering and other equipment is to be stowed prior to take-off.

4.5.3 All items of galley electrical equipment should be switched off.

4.5.4 Operators must ensure that at any time the aircraft is on the ground, provision for the safe and rapid evacuation of passengers in an emergency is maintained.

4.6 **Cabin Lights for Take-off and Landing**

The dimming of interior cabin lights, particularly when taking-off and landing at night, is recommended.

4.7 **Refuelling Operations with Passengers on Board**

An aeroplane shall not be refuelled when passengers are embarking, on board or disembarking unless it is properly attended by qualified personnel ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available. When operators wish to refuel aircraft with passengers embarking, on board, or disembarking, two-way communication shall be maintained by the aeroplane's inter-communication system or other suitable means between the ground crew supervising the refuelling and the qualified personnel on board the aeroplane. Instructions should also be issued to crews at least the following points:

(a) aircraft steps and jetties, and cabin crew positions;

(b) smoking prohibition;

(c) restriction on use of electrical equipment and switch gear; and

(d) slide arming and clearance area.

Operators should discuss such proposals with their assigned Inspectors.

Note 1: The deployment of integral aeroplane stairs or the opening of emergency exits is not necessarily required as a prerequisite to refuelling.

Note 2: Provisions concerning aircraft refuelling are contained in Annex 14, Volume I, and guidance on safe refuelling practices is contained in the Airport Services manual, (Doc 9137), Parts 1 and 8.

Note 3: Additional precautions are required when refuelling with fuels other than aviation kerosene or when refuelling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.

4.8 Flight Crew and Cabin Crew Liaison

4.8.1 Operators' instructions should be clear on the need for good liaison to exist between flight crew and cabin crew.

4.8.2 A means must be established for the conduct of liaison. Such liaison should extend until after the aircraft has arrived at its final destination where, for instance, cabin safety equipment defects may need to be attended to.

5 SAFETY, EMERGENCY AND SURVIVAL EQUIPMENT

5.1 Provision of Oxygen Equipment

5.1.1 The amount of oxygen to be carried and the number of passengers for whom suitable masks must be made available vary with operating altitude, attainable rate of descent and Minimum Safe Altitude (MSA).

5.1.2 Information and instructions must be provided by the operator to his operating staff to ensure that flights may be conducted in accordance with the relevant legislation. Any aircraft which is not correctly equipped must be appropriately restricted in its use, e.g. by imposition of operating altitude or route restrictions, until such time as an appropriate scale of oxygen and equipment is fitted or repairs effected.

NOTE: Information on the dangers of explosion caused by the proximity of any oxygen equipment, including therapeutic oxygen, to any naked flame or incipient fire must be stressed.

5.2 Re-stowage of Oxygen Masks

It is recommended that cabin crew do not attempt to re-stow oxygen masks after deployment. Damage to the equipment and possibly cabin crew injury may result. Re-stowage of such equipment should be undertaken by maintenance personnel only.

5.3 Portable Protective Breathing equipment

5.3.1 Portable Protective Breathing Equipment (PPBE) must be approved by the CAD. Advice on which equipment has been approved may be obtained from the CAD's Airworthiness Office.

5.3.2 PPBE units are to be stowed as close to the crew station as practicable and must be readily accessible. Pre-flight serviceability checks must be capable of being readily achieved.

5.3.3 Operators should ensure that transportation security or any other seals are removed prior to installation on the aircraft.

5.3.4 Failures or any problems associated with PPBE must be reported via the Mandatory Occurrence Reporting scheme (MOR) to the Airworthiness Office.

5.4 Carriage of Tropical and Polar Survival Equipment

5.4.1 The AN(HK)O specifies the type and quantity of equipment which is required to be carried on flights over areas where, in the event of an emergency landing, tropical or polar conditions are likely to be met. Such areas are defined as follows:

(a) Tropical Areas

(i) those parts of Asia south of latitude 40°N;

(ii) Africa;

(iii) Central and South America; and

(iv) New Guinea and the remote central areas of Australia.

(b) Polar areas

(i) areas north of latitude 66°33'N and south of latitude 66°33'S;

(ii) that area of North America north of 60°N and between longitude 60°W and 175°W (Seasonal);

(iii) that part of Asia north of latitude 40°N and east of longitude 45°E, but excluding mainland Japan (Seasonal); and

(iv) that part of Europe, including the UK, north of latitude 56°N (Seasonal).

5.4.2 Carriage of such equipment is not required if an aircraft flies within the areas detailed at paragraph 5.4.1 of this section and an emergency landing can be made where polar and tropical conditions are not likely to be encountered, provided the same range and performance criteria detailed in the 'circumstances of flight' column of paragraph 4 of Schedule 5 to the AN(HK)O, to establish whether sea survival equipment (scale K) needs to be carried, are not exceeded.

5.4.3 Polar survival equipment will usually be required to be carried during the period November to April inclusive. Flights conducted north of the Arctic Circle are unlikely to be affected by seasonal variations in climate thus requiring the carriage of such equipment at all times of the year.

5.4.4 Some States call for the carriage of particular survival equipment on flights over their territory. Operators should familiarise themselves with these requirements.

5.4.5 Special consideration should be given to the carriage of durable water containers to take advantage of fresh water supplies on board the aircraft.

5.4.6 For operations by helicopters and small aeroplanes in desert areas, where Search and Rescue (SAR) facilities are known to be limited and climatic conditions are particularly inhospitable, tropical equipment will be considered necessary. Similarly for operations in wintry conditions, particularly by helicopters, consideration should be given to the carriage of polar equipment.

5.5 Search and Rescue

5.5.1 The operations manual shall include the ground-air visual signal code for use by survivors, as contained in ICAO Annex 12.

5.6 Carriage of Life-jackets and Flotation Cots for Children and Infants

5.6.1 Arrangements must be made to ensure that appropriate survival equipment is available for children and infants prior to the despatch of an aircraft.

5.6.2 On flights where life-jackets are to be carried, the following equipment is required to be provided for each child and infant:

(a) children of 3 years and over:

an adult life-jacket which has been approved for use by children;

(b) infants between 18 months and 3 years:

an approved infant life-jacket;

(c) infants under the age of 18 months:

an approved flotation cot.

NOTE: Infant flotation devices are approved solely for the purpose of protection and flotation on water and not as restraint devices prior to impact. 'Approved' in the above context refers to the approval obtained by the equipment's manufacturer.

5.6.3 Operators should establish procedures for the provision and re-provision of such equipment, when standard aircraft installations are supplemented by uplifts at route stations.

5.7 Waste Containment

5.7.1 All receptacles for towels, paper and other waste are to be constructed of materials resistant to fire as required by the relevant airworthiness requirements. Their fire containment is to be demonstrated by test.

5.7.2 Waste bags are not approved by the CAD. It is, however, the responsibility of the operator to control the quality of their waste bags in order that resistance to fire is maintained; the fire containment must be demonstrated by the test. For further information contact the Airworthiness Office.

5.7.3 Waste bags may only be stowed in toilet compartments during the final phases of flight, provided that they contain only low density waste such as paper and plastic cups.

6 ABNORMAL AND EMERGENCY PROCEDURES

6.1 Turbulence

6.1.1 If turbulence is forecast, the aircraft commander should brief the SCCM prior to departure.

6.1.2 When turbulence is encountered, the commander should direct appropriate action via the SCCM.

6.1.3 If in-flight service is to be discontinued, all trolleys, galleys and cabin equipment are to be secured and checks undertaken to ensure that passengers are seated with their seatbelts fastened.

6.1.4 Cabin crew should take their seats and fasten harnesses as soon as is reasonably practicable.

6.1.5 Operators should have in place procedures regarding the avoidance and handling of in-flight turbulence. Regular review should be carried out with respect to the following:

(a) Preflight briefing by flight crew to the cabin crew and the passengers of the forecasted turbulence;

(b) Proper and effective weather assessment before and during flight by all available means;

(c) Commitment to SOP with regard to seat-belt usage, turbulence and weather avoidance techniques and effective communication during the flight;

(d) CRM training for crew members;

(e) Effective training to prevent or mitigate injuries to cabin crew caused by turbulence;

(f) Establishment of policy and procedures as to when cabin crew should be seated taking into account the potential risk of turbulence in flight.

6.2 Cabin Fires

6.2.1 Cabin crew must continually survey the aircraft cabin and galley areas for potential and existing fires.

6.2.2 Additionally, a frequent check of toilet areas must be undertaken, noting in particular that smoke sensors remain unblocked.

6.2.3 On detecting a fire and/or smoke, the flight crew must be informed immediately of its location, source and severity and be kept informed as the situation develops.

6.2.4 After a fire has been extinguished, the area around it must be monitored for potential re-ignition.

6.3 Oven Fires

6.3.1 Oven fires can be caused by a variety of factors the dangers of which would be minimised by thorough inspections of ovens both for cleanliness and for the presence of foreign objects.

6.3.2 The primary hazard from an oven fire occurs when the door of a heated oven is opened. The introduction of outside oxygen can cause a flash fire. In dealing with an oven fire or oven overheat, the following procedure is recommended:

(a) isolate the electrics and keep the door closed. In most incidents the fire will self-extinguish;

(b) monitor the situation. Have a fire extinguisher, fire gloves and protective breathing equipment (PPBE) to hand; and

(c) if the situation worsens, or it is thought that fire still exists in the oven, open the oven door just enough to insert the nozzle of the fire extinguisher. Insert the nozzle of the fire extinguisher and discharge a small amount of the extinguishant; consideration should be given to donning PPBE and fire gloves prior to opening the oven door. Close the oven door and monitor the oven. Repeat this procedure if necessary.

6.4 Ban on the use of Therapeutic Oxygen whilst Fire Fighting

The use of therapeutic oxygen whilst fire-fighting is extremely hazardous since therapeutic oxygen may itself feed the fire, thus resulting in severe injuries to the crew member wearing the equipment. Additionally, therapeutic oxygen equipment only provides a low supplemental oxygen flow which will afford little relief in a smoke-laden atmosphere.

6.5 Bomb Warning Procedures

On receipt of a bomb-on-board warning, the SCCM is to implement the procedures detailed in the Operations Manual and associated aircraft checklists, as directed by the aircraft commander.

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CHAPTER 8 - CARGO COMPARTMENT SAFETY

1 TRANSPORT OF ITEMS IN THE CARGO COMPARTMENT

1.1 An operator shall establish policy and procedures for the transport of items in the cargo compartment, which include the conduct of a specific safety risk assessment. The risk assessment shall include at least the following:

a) hazards associated with the properties of the items to be transported;

b) capabilities of the operator;

c) operational considerations (e.g. area of operations, diversion time);

d) capabilities of the aeroplane and its systems (e.g. cargo compartment fire suppression capabilities);

e) containment characteristics of unit load devices;

f) packing and packaging;

g) safety of the supply chain for items to be transported; and

h) quantity distribution of dangerous goods items to be transported.

2 FIRE PROTECTION

2.1 An operator shall establish policy and procedures that address the items to be transported in the cargo compartment. When determining the items to be transported in the cargo compartment, an operator shall take into account the elements of the cargo compartment(s) fire protection system as approved by the State of Design, and the documented cargo compartment fire protection standards during aircraft certification.

Note: Reference can be made to ICAO Cargo Compartment Operational Safety Manual (Doc 10102) under development for guidance on policy and procedures that address the items to be transported in the cargo compartment.

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