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LOW VISIBILITY OPERATIONS (LVO)

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HONG KONG

CIVIL AVIATION DEPARTMENT

TERMINOLOGY

Terms used in this publication have the following meaning:

(1) "Low Visibility Procedures (LVP)". Procedures applied at an aerodrome for the purpose of ensuring safe operation during Lower than Standard Category 1, Other than Standard Category II, Category II and III approaches and Low Visibility Take-Offs.

(2) "Low Visibility Take-Off (LVTO)". A take-off where the runway visual range (RVR) is less than 400 m.

(3) "Decision Height (DH)". Decision height is the wheel height above the runway elevation by which a go-around must be initiated unless adequate visual reference has been established and the aeroplane position and approach path have been assessed as satisfactory to continue the approach and landing in safety. In this manual, it refers to Height Above Threshold (HAT) which is defined as the theoretical height above the runway threshold elevation.

(4) "Precision approach runway, category II". An instrument runway served by ILS and/or GPS and visual aids intended for operations with a decision height lower than 200 ft but not lower than 100 ft and a runway visual range not less than 300 m.

(5) "Precision approach runway, category III". An instrument runway served by ILS and/or GPS to and along the surface of the runway and:

A - intended for operations with a decision height lower than 100 ft, minimum decision height of 50 ft and a runway visual range not less than 175 m.

B - intended for operations with a decision height lower than 50 ft, minimum decision height of 15 ft, and a runway visual range not less than 125 m or no decision height and a runway visual range less than 125 m but not less than 50 m.

C - intended for operations with no decision height and no runway visual range.

(6) "Alert Height (AH)". The alert height is a specified radio height, based on the characteristics of the aeroplane and its fail-operational landing system.

(7) "Flight control system". A system which includes an automatic landing system and/or a hybrid landing system.

(8) "Fail-Passive flight control system". A flight control system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition or deviation of flight path or attitude but the landing is not completed automatically. For a fail-passive automatic flight control system the pilot assumes control of the aeroplane after a failure.

(9) "Fail-Operational flight control system". A flight control system is fail-operational if, in the event of a failure below alert height, the approach, flare and landing, can be completed automatically. In the event of a failure, the automatic landing system will operate as a fail-passive system.

(10) "Fail-Operational hybrid landing system". A system which consists of a primary fail-passive automatic landing system and a secondary independent guidance system enabling the pilot to complete a landing manually after failure of the primary system.

(11) "Stabilised approach (SAP)". An approach which is flown in a controlled and appropriate manner in terms of configuration, energy and control of the flight path from a pre-determined point or altitude/height down to a point 50 feet above the threshold or the point where the flare manoeuvre is initiated if higher.

(12) "Head-up display (HUD)". A display system which presents flight information into the pilot's forward external field of view and which does not significantly restrict the external view.

(13) "Head-up guidance landing system (HUDLS)". The total airborne system which provides head-up guidance to the pilot during the approach and landing and/or go-around. It includes all sensors, computers, power supplies, indications and controls. A HUDLS is typically used for primary approach guidance to decision heights of 50 ft.

(14) "Hybrid head-up display landing system (hybrid HUDLS)". A system which consists of a primary fail-passive automatic landing system and a secondary independent HUD/HUDLS enabling the pilot to complete a landing manually after failure of the primary system.

Note: Typically, the secondary independent HUD/HUDLS provides guidance which normally takes the form of command information, but it may alternatively be situation (or deviation) information.

(15) "Enhanced vision system (EVS)". An electronic means of displaying a real time image of the external scene through the use of imaging sensors.

(16) "Converted meteorological visibility (CMV)". A value (equivalent to an RVR) which is derived from the reported meteorological visibility, as converted in accordance with the requirements in Chapter 7.

(17) "Lower than Standard Category I Operation". A Category I Instrument Approach and Landing Operation using Category I DH, with an RVR lower than would normally be associated with the applicable DH.

(18) "Other than Standard Category II Operation". A Category II Instrument Approach and Landing Operation to a runway where some or all of the elements of the ICAO Annex 14 Precision Approach Category II lighting system are not available.

(19) “GNSS landing system (GLS)”. An approach operation using augmented GNSS information to provide guidance to the aircraft based on its lateral and vertical GNSS position. (It uses geometric altitude reference for its final approach slope).

(20) “Obstacle free zone (OFZ)”. A volume of airspace extending upwards and outwards from an inner portion of the runway strip to specified upper limits which is kept clear of all obstacles except for minor specified items.

(21) “ILS sensitive area” (LSA). An area extending beyond the critical area where the parking and/or movement of vehicle, including aeroplanes, is controlled to prevent the possibility of unacceptable interference to the ILS signal during ILS operations. The sensitive area is protected to provide protection against interference caused by large moving objects outside the critical area but still normally within the aerodrome boundary.

REFERENCE

Low Visibility Procedures (LVP)

Bibliography

EASA	=	European Aviation Safety Agency	AC	=	Advisory Circular
			CS-AWO	=	Certification Specifications All Weather Operations
			FAR	=	Federal Aviation Regulations
CAP	=	Civil Aviation Publications	FAA	=	Federal Aviation Administration

All-Weather Operations – areas in which rules are required	United Kingdom/Europe	United States
The operations:		
a) Airworthiness requirements		
Category II Category III	EASA CS-25 CS-AWO	AC 120-29A, 120-28D, FAR-25 Category II and Category III
b) Flight crew qualifications and training	EUOPS 1 Subpart (E) and TGL 44	FAR 121 Subparts N and O and qualifications and Appendices E and F
c) Operating procedures and in-service proving of procedures.	EU OPS 1 Subpart (E) and TGL 44	AC 120-28D, AC 120-29A, FAA Order 8200.97
d) Aerodrome operating minima	ICAO Doc 8186 (PAN-OPS)	FAR 97 and Standard Instrument Approach Procedures FAA Order 8260.3B (TERPS)
The aerodrome:		
a) Adequacy of runways and taxiways	CAP 168, Chapter 3	AC 150-5325-2C, 150-5335-2, 150-5335-5
b) Visual and non-visual		
1) Visual	CAP 168, Chapters 5 and 7	FAA Order 8200.1, 8260.3B (TERPS), 8260.19A, 6700.11, 6750.16A, 6750.24A

All-Weather Operations – areas in which rules are required	United Kingdom/Europe	United States
2) Non-visual	ICAO Doc 9365 (Manual of All Weather Operations)	AC 150-5340-24, 150-5340-4C, 150-5340-19
c) Obstacle clearance criteria	CAP 168, Chapter 4	FAA Order 8260.3B (TERPS)
d) Meteorological service and the assessment and dissemination of RVR	UK Air Pilot (MET) Manual of Air Traffic Services ICAO PANS-RAC	AC 97-1A, 00-6A, 00-45C
e) Air traffic service, including ground movement control	Manual of Air Traffic Services UK Air Pilot (RAC) ICAO Doc 4444 (Rules of Air Traffic Services)	FAA Order 7110.65C, 7930.1A
Certification and authorization:		
a) The aircraft	EASA CS-25	AC 120-28D, 120-29A
b) The aerodrome	CAP 168	FAR 139
c) The aircraft operator	ICAO Doc 9365 (Manual of All Weather Operations)	FAA Order 8430.6C, 8320.12, 8900.1

CHAPTER 1 – APPLICABILITY

1.1 Low Visibility Operations – Introduction

The purpose of this handbook is to indicate the nature of the Hong Kong Civil Aviation Department's (CAD) requirements for lower than Standard Category I, other than Standard Category II, Category II, IIIA, IIIB and IIIC operations and for take-offs in low visibilities.

1.2 Low Visibility Operations – Co-ordination Requirements

In establishing the aerodrome operating minima an operator must take full account of:

(a) the type, performance and handling characteristics of the aeroplane;

(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 and/or control of the flight path, as appropriate, during the take-off, the approach, the flare, the landing, roll-out and the missed approach;

(f) the obstacles in the approach, missed approach and the climb-out areas required for the execution of contingency procedures and necessary clearance;

(g) the obstacle clearance altitude/height for the instrument approach procedures;

(h) the means to determine and report meteorological conditions; and

(i) the flight technique to be used during the final approach.

1.3 Low Visibility Operations – Flight Crew Training

An operator shall ensure that, prior to conducting Low Visibility Take-Off, Lower than Standard Category I, Other than Standard Category II, Category II and III operations or approaches utilising EVS:-

1.3.1 Each flight crew member:

(a) Completes the training and checking requirements prescribed in Chapter 3 including Flight simulator training in operating to the limiting values of RVR/CMV and Decision Height appropriate to the operator's approval; and

(b) Is qualified in accordance with Chapter 3.

1.3.2 The training and checking is conducted in accordance with a detailed syllabus approved by the CAD and included in the Operations Manual; and

1.3.3 The flight crew qualification is specific to the operation and the aeroplane type.

1.4 **Low Visibility Operations – Operating procedures**

1.4.1 An operator must establish procedures and instructions to be used for Low Visibility Take-Off, approaches utilising EVS, Lower than Standard Category I, Other than Standard Category II, Category II and III, operations. These procedures must be included in the Operations Manual and contain the duties of flight crew members during taxiing, take-off, approach, flare, landing, roll-out and missed approach as appropriate.

1.4.2 The Pilot-in-Command (PIC) shall satisfy himself/herself that:

(a) The status of the visual and non-visual facilities is sufficient prior to commencing a Low Visibility Take-Off, an approach utilising EVS, a Lower than Standard Category I, an Other than Standard Category II, or a Category II or III approach;

(b) Appropriate LVPs are in force according to information received from Air Traffic Services, before commencing a Low Visibility Take-Off, a Lower than Standard Category I, an Other than Standard Category II, or a Category II or III approach; and

(c) The flight crew members are properly qualified prior to commencing a Low Visibility Take-Off in an RVR of less than 400 m, an approach utilising EVS, a Lower than Standard Category I, an Other than Standard Category II or a Category II or III approach.

1.5 Low visibility operations – Aerodrome considerations

1.5.1 An operator shall not use an aerodrome for Category II or III operations unless the aerodrome is approved for such operations by the State in which the aerodrome is located.

1.5.2 An operator shall verify that LVPs have been established, and will be enforced, at those aerodromes where low visibility operations are to be conducted.

1.6 Low visibility operations – Certification and Authorization

1.6.1 An operator shall not conduct Category II, Other than Standard Category II, or Category III operations unless:

(a) each aeroplane concerned is certificated for operations with decision heights below 200 ft, or no decision height, and equipped in accordance with Chapter 2 on low visibility operations or an equivalent accepted by the CAD;

(b) a suitable system for recording approach and/or automatic landing success and failure is established and maintained to monitor the overall safety of the operations;

(c) the operations are approved by the CAD;

Note: In the conduct of Other than Standard Category II operations, allowable on special authorization runways, it is mandatory for an operator to utilise the aircraft autoland or HUD certified to touchdown, under FAA Order 8400.13D, as amended, to comply with CAD requirement.

(d) the flight crew consists of at least two pilots; and

(e) decision height is determined by means of a radio altimeter.

1.6.2 An operator shall not conduct Low Visibility Take-Offs in less than 400 m RVR unless approved by the CAD.

1.6.3 An operator shall not conduct Lower than Standard Category I operations unless approved by the CAD. In general the evaluation and approval process as detailed in Section 6.3, where applicable, applies.

1.7 **Low visibility operations – Minimum equipment**

1.7.1 An operator must include in the Operations Manual, where applicable, the minimum equipment that has to be serviceable at the commencement of a Low Visibility Take-Off, a Lower than Standard Category I approach, an Other than Standard Category II approach, an approach utilising EVS, or a Category II or III approach in accordance with the Aircraft Flight Manual (AFM) or other approved document.

1.7.2 The PIC shall satisfy himself/herself that the status of the aeroplane and of the relevant airborne systems is appropriate for the specific operation to be conducted.

CHAPTER 2 – THE AEROPLANE

2.1 The Aeroplane

2.1.1 The requirements to be met for the certification of Hong Kong registered aeroplanes for Category II and III operations are specified in FAR-25 or EASA CS-25/CS-AWO.

2.1.2 Aeroplanes not registered in Hong Kong will be accepted for Category II and III operations provided that the certification by the State of Registry is based on FAR-25 or EASA CS-25/CS-AWO or an equivalent standard.

2.2 In Service Proving

2.2.1 The operator should carry out a proving programme to demonstrate that during line service, the performance and reliability of the aeroplane and its systems meet the criteria on which the airworthiness certification was based. For aeroplanes registered in Hong Kong, this programme should be agreed in detail with the Airworthiness Division of the CAD before it commences. For aeroplanes not registered in Hong Kong, the operator should provide evidence that a suitable programme has been satisfactorily completed. Further information is available from CAD Airworthiness Division.

2.3 Airborne Equipment

The following items of equipment will be required for operations to the decision heights specified unless it is shown that the intended level of safety is achieved with alternative equipment or the deletion of some items.

2.3.1 *Category II*

(a) Autopilot with ILS coupling mode.

NOTE: A flight director system (head up or down) with an ILS coupling mode may be approved for use following failure or disconnect of the autopilot.

(b) Autothrust, unless it can be shown that speed control does not add excessively to the crew work load.

(c) Radio altimeter.

(d) Excess ILS deviation warnings.

2.3.2 *Category IIIA*

(a) Equipment required in 2.3.1 above.

(b) Autopilot with an automatic landing mode.

2.3.3 *Category IIIB*

(a) Equipment required in 2.3.1 (a) (c) and (d).

(b) Autothrust.

(c) Autopilot with a fail-operational automatic landing system and an automatic missed approach mode.

2.3.4 *Category IIIC*

(a) Equipment required in 2.3.1 (a) (c) and (d).

(b) Equipment required in 2.3.3 (b) and (c).

(c) Autopilot with a fail-operational ground roll mode.

(d) Anti-skid braking system, as required by the aircraft certification.

2.3.5 *Aeroplane categories – All weather operations*

(a) Classification of aeroplanes

The criteria taken into consideration for the classification of aeroplanes by categories is the indicated airspeed at threshold (V_{AT}) which is equal to the stalling speed (V_{SO}) multiplied by 1.3 or 1G stall speed (V_{S1G}) multiplied by 1.23 in the landing configuration at the maximum certificated landing mass. If both V_{SO} and V_{S1G} are available, the higher resulting V_{AT} shall be used. The aeroplane categories corresponding to V_{AT} values are in the Table below:

Aeroplane Category	V_{AT}
A	Less than 91 kt
B	From 91 to 120 kt
C	From 121 to 140 kt
D	From 141 to 165 kt
E	From 166 to 210 kt

The landing configuration which is to be taken into consideration shall be defined by the operator or by the aeroplane manufacturer.

(b) Permanent change of category (maximum certificated landing mass)

(i) An operator may impose a permanent, lower, landing mass, and use this mass for determining the V_{AT} if approved by the CAD.

(ii) The category defined for a given aeroplane shall be a permanent value and thus independent of the changing conditions of day-to-day operations.

CHAPTER 3 – FLIGHT CREW TRAINING

3.1 General

An operator must ensure that flight crew member training programmes for low visibility operations include structured courses of ground, flight simulator and/or flight training. The operator may abbreviate the course content as prescribed by subparagraphs 3.1.2 and 3.1.3 below provided the content of the abbreviated course is acceptable to the CAD.

3.1.1 Flight crew members with no Category II or Category III experience must complete the full training programme prescribed in subparagraphs 3.2, 3.3 and 3.4 below.

3.1.2 Flight crew members with Category II or Category III experience with a similar type of operation (auto-coupled/auto-land, HUDLS/Hybrid HUDLS or EVS) or Category II with manual land if appropriate with another public transport operator may undertake an:

(a) abbreviated ground training course if operating a different type/class from that on which the previous Category II or Category III experience was gained;

(b) abbreviated ground, flight simulator and/or flight training course if operating the same type class and variant of the same type or class on which the previous Category II or Category III experience was gained. The abbreviated course is to include at least the requirements of subparagraphs 3.4.1, 3.4.2(a) or 3.4.2(b) as appropriate and 3.4.3(a). With the approval of the CAD, the operator may reduce the number of approaches/landings required by sub-paragraph 3.4.2(a) if the type/class or the variant of the type or class has the same or similar:

(i) level of technology – flight control/guidance system (FGS); and

(ii) operator procedures;

(iii) handling characteristics (See paragraph 3.1.4 below);

(iv) use of HUDLS/hybrid HUDLS;

(v) use of EVS;

as the previously operated type or class, otherwise the requirement of 3.4.2(a) has to be met in full.

3.1.3 Flight crew members with Category II or Category III experience with the operator may undertake an abbreviated ground, flight simulator and/or flight training course.

The abbreviated course when changing:

(a) aeroplane type/class is to include at least the requirements of subparagraphs 3.4.1, 3.4.2(a) or 3.4.2(b) as appropriate and 3.4.3(a);

(b) to a different variant of aeroplane within the same type or class rating that has the same or similar:

(i) level of technology – flight control/guidance system (FGS);

(ii) operational procedures – integrity; and

(iii) handling characteristics (See paragraph 3.1.4 below);

(iv) use of HUDLS/hybrid HUDLS;

(v) use of EVS;

as the previously operated type or class, then a difference course or familiarisation appropriate to the change of variant fulfils the abbreviated course requirements;

(c) to a different variation of aeroplane within the same type or class rating that has a significantly different:

(i) level of technology – flight control/guidance system (FGS);

(ii) operational procedures – integrity; and

(iii) handling characteristics (See paragraph 3.1.4 below);

(iv) use of HUDLS/hybrid HUDLS;

(v) use of EVS;

then the requirements of subparagraphs 3.4.1, 3.4.2 (a), 3.4.2(b) as appropriate and 3.4.3(a) shall be fulfilled. With the approval of the CAD the operator may reduce the number of approaches/landings required by subparagraph 3.4.2(a).

3.1.4 An operator must ensure when undertaking Category II or Category III operations with different variant(s) of aeroplane within the same type or class rating that the differences and/or similarities of the aeroplanes concerned justify such operations, taking account at least the following:

(a) the level of technology, including the:

(i) FGS and associated displays and controls;

(ii) the Flight Management System and its integration or not with the FGS;

(iii) use of HUD/HUDLS with hybrid systems and/or EVS;

(b) operational procedures, including:

(i) fail-passive/fail-operational, alert height;

(ii) manual landing/automatic landing;

(iii) no decision height operations;

(iv) use of HUD/HUDLS with hybrid systems;

(c) handling characteristics, including:

(i) manual landing from automatic HUDLS and/or EVS guided approach;

(ii) manual go-around from automatic approach;

(iii) automatic / manual roll out.

3.2 **Ground training**

An operator must ensure (unless otherwise covered in its training syllabus) that the initial ground training course for low visibility operations covers at least:

(a) the characteristics and limitations of the ILS;

(b) the characteristics of the visual aids;

(c) the characteristics of fog;

(d) the operational capabilities and limitations of the particular airborne system to include HUD symbology and EVS characteristics, if appropriate;

(e) the effects of precipitation, ice accretion, low level wind shear and turbulence;

(f) the effect of specific aeroplane/system malfunctions;

(g) the use and limitations of RVR assessment systems;

(h) the principles of obstacle clearance requirements;

(i) recognition of the effect on minima caused by changes in the status of ground installations and action to be taken;

(j) the procedures and precautions to be followed with regard to surface movement during operations when the RVR is 400 m or less;

(k) Emphasis should be placed on possible Runway Incursion during LVP taxiing. Details of LVP taxi procedures and knowledge of aerodrome lightings and stop-bar lightings etc. must be covered;

(l) the significance of decision heights based upon radio altimeters and the effect of terrain profile in the approach area on radio altimeter readings and on the automatic approach/landing system;

(m) the importance and significant of alert height, if applicable, and the action in the event of any failure above and below the alert height;

(n) the qualification requirements for pilots to obtain and retain approval to conduct Low Visibility Take-Offs and Category II or III operations; and

(o) the importance of correct seating and eye position.

3.3 **Flight simulator training and/or flight training**

3.3.1 An operator must ensure that flight simulator and/or flight training for low visibility operations includes:

(a) checks of satisfactory function of equipment, both on the ground and in flight;

(b) (i) monitoring of automatic flight control systems and auto land status annunciators with emphasis on the action to be taken in the event of failures of such system; and

(ii) HUD/HUDLS/EVS guidance status and annunciators as appropriate; to include head down displays;

(c) actions to taken in the event of failures such as engines, electrical systems, hydraulics or flight control systems;

(d) the effect of known unserviceabilities and use of minimum equipment lists;

(e) guidance on the visual cues required at decision height together with information on maximum deviation allowed from glide path or localiser; and

(f) the importance and significance of alert height if applicable and the action in the event of any failure above and below the alert height.

3.3.2 An operator must ensure that each flight crew member is trained to carry out his/her duties and instructed on the coordination required with other crew members. Maximum use should be made of flight simulators.

3.3.3 Training must be divided into phases covering normal operation with no aeroplane or equipment failures but including all weather conditions which may be encountered and detailed scenarios of aeroplane and equipment failure which could affect Category II or III operations. If the aeroplane system involves the use of hybrid or other special systems (such as HUD/HUDLS or enhanced vision equipment) then flight crew members must practise the use of these systems in normal and abnormal modes during the flight simulator phase of training.

3.3.4 Incapacitation procedures appropriate to Low Visibility Take-Offs and Category II and III operations shall be practised.

3.3.5 For aeroplanes with no flight simulator available to represent that specific aeroplane operators must ensure that the flight training phase specific to the visual scenarios of Category II operations is conducted in a specifically approved flight simulator. Such training must include a minimum of four approaches. The training and procedures that are type specific shall be practised in the aeroplane.

3.3.6 Initial Category II and III training shall include at least the following exercises:

(a) approach using the appropriate flight guidance, autopilots and control systems installed in the aeroplane, to the appropriate decision height and to include transition to visual flight and landing;

(b) approach with all engines operating using the appropriate flight guidance systems, autopilots, HUDLS and/or EVS and control systems installed in the aeroplane down to the appropriate decision height followed by missed approach; all without external visual reference;

(c) where appropriate, approaches utilising automatic flight systems to provide automatic flare, landing and roll-out; and

(d) normal operation of the applicable system both with and without acquisition of visual cues at decision height.

3.3.7 Subsequent phases of training must include at least:

(a) approaches with engine failure at various stages on the approach;

(b) approaches with critical equipment failures (e.g. electrical systems, auto flight systems, ground and/or airborne ILS/MLS systems and status monitors);

(c) Approaches where failures of auto flight equipment and/or HUD/HUDLS/EVS at low level require either;

(i) reversion to manual flight to control flare, landing and roll out or missed approach; or

(ii) revision to manual flight or a downgraded automatic mode to control missed approaches from, at or below decision height including those which may result in a touchdown on the runway;

(d) failures of the systems which will result in excessive localiser and/or glide slope deviation, both above and below decision height, in the minimum visual conditions authorised for the operation; in addition, a continuation to a manual landing must be practised if a head up display forms a downgraded mode of the automatic system or the head up display forms the only flare mode, and

(e) failures and procedures specific to aeroplane type or variant.

3.3.8 The training programme must provide practice in handling faults which require a reversion to higher minima.

3.3.9 The training programme must include the handling of the aeroplane when, during a fail passive Category III approach, the fault causes the autopilot to disconnect at or below decision height when the last reported RVR is 300 m or less.

3.3.10 Where take-offs are conducted in RVRs of 400 m and below, training must be established to cover systems failures and engine failure resulting in continued as well as rejected take-offs.

3.3.11 The training programme must include, where appropriate, approaches where failures of the HUDLS and/or EVS equipment at low level require either:

(a) revision to head down displays to control missed approach; or

(b) revision to flight with no, or downgraded, HUDLS Guidance to control missed approaches from decision height or below, including those which may result in a touchdown on the runway.

3.3.12 An operator shall ensure that when undertaking Low Visibility Take-Off, Lower than Standard Category I, Other than Standard Category II, and Category II and III Operations utilising a HUD/HUDLS or hybrid HUD/HUDLS or an EVS, that the training and checking programme includes, where appropriate, the use of the HUD/HUDLS in normal operations during all phases of flight.

3.4 **Conversion**

Conversion training requirements to conduct Low Visibility Take-Off, Lower than Standard Category I, Other than Standard Category II, approach utilising EVS and Category II and III Operations. An operator shall ensure that each flight crew member completes the following low visibility procedures training if converting to a new type/class or variant of aeroplane in which Low Visibility Take-Off, Lower than Standard Category I, Other than Standard Category II, approach utilising EVS with an RVR of 800 m or less and Category II and III Operations will be conducted. The flight crew member experience requirements to undertake an abbreviated course are prescribed in subparagraphs 3.1.2, 3.1.3 and 3.1.4 above.

3.4.1 Ground Training. The appropriate requirements prescribed in subparagraph 3.2 above, taking into account the flight crew member's Category II and Category III training and experience.

3.4.2 Flight simulator training and/or flight training.

(a) A minimum of six (eight for HUDLS with or without EVS) approaches and/or landings in a flight simulator, including at least one go-around. The requirements for eight HUDLS approaches may be reduced to six when conducting hybrid HUDLS operations. (see sub-paragraph 3.4.4(a) below)

(b) Where no flight simulator is available to represent that specific aeroplane, a minimum of three approaches (five for HUD and /or EVS) including at least one go-around is required on the aeroplane. For hybrid HUDLS operations a minimum of three approaches are required, including at least one go-around.

(c) Appropriate additional training if any special equipment is required such as head up displays or enhanced vision equipment. When approach operations utilising EVS are conducted with an RVR less than 800m, a minimum of five approaches, including at least one go around are required on the aeroplane.

3.4.3 Flight crew qualification. The flight crew qualification requirements are specific to the operator and the type of aeroplane operated.

(a) The operator must ensure that each flight crew member completes a check before conducting Category II or III operations.

(b) The check prescribed in subparagraph (a) above may be replaced by successful completion of the flight simulator and/or flight training prescribed in subparagraph 3.4.2 above.

3.4.4 Line flying under supervision. An operator must ensure that each flight crew member undergoes the following line flying under supervision (LFUS):

(a) For Category II, a minimum of one autoland except that: when a manual landing or HUDLS approach to touchdown is normally required in the Aircraft Flight Manual (AFM), a minimum of three landings from autopilot disconnect; or four landings with HUDLS used to touch down; however, only one manual landing (two using HUDLS to touchdown) is required when the training required in sub-paragraph 3.4.2 above had been carried out in a flight simulator qualified for zero flight time conversion.

(b) For Category III, a minimum of two autolands except that:

(i) only 1 autoland is required when the training required in subparagraph 3.4.2 above has been carried out in a flight simulator qualified for zero flight time conversion;

(ii) no autoland is required during LFUS when the training required in subparagraph 3.4.2 above has been carried out in a flight simulator qualified for zero flight time (ZFT) conversion and the flight crew member successfully completed the ZFT type rating conversion course;

(c) the flight crew member, trained and qualified in accordance with paragraph (a) & (b) above, is qualified to operate during the conduct of LFUS to the lowest approved DA(H) and RVR as stipulated in the Operations Manual except that the first autoland is to be carried out in weather conditions at, or above, Category I minima.

(d) For Category III approaches using HUDLS to touchdown a minimum of four approaches.

3.5 **Type and command experience**

3.5.1 Before commencing Category II operations, the following additional requirements are applicable to PICs, or pilots to whom conduct of the flight may be delegated, who are new to the aeroplane type/class:-

(a) 50 hours or 20 sectors on the type, including line flying under supervision; and

(b) 100 m must be added to the applicable Category II RVR minima when the operation requires a Category II manual landing or use of HUDLS to touchdown until:

(i) a total of 100 hours or 40 sectors, including LFUS has been achieved on the type; or

(ii) a total of 50 hours or 20 sectors, including LFUS has been achieved on the type where the flight crew member has been previously qualified for Category II manual landing operations with a public transport operator.

(c) For HUDLS operations the sector requirement in paragraph 3.5.1 and 3.5.2 should always be applicable, the hours on type class does not fulfill the requirement.

3.5.2 Before commencing Category III operations, the following additional requirements are applicable to PICs, or pilots to whom conduct of the flight may be delegated, who are new to the aeroplane type:-

(a) 50 hours or 20 sectors on the type, including line flying under supervision; and

(b) 100 m must be added to the applicable Category II or Category III RVR minima unless he has previously qualified for Category II or III operations with a public transport operator, until a total of 100 hours or 40 sectors, including line flying under supervision, has been achieved on the type.

3.5.3 A reduction in the command requirements (mentioned in subparagraphs 3.5.1 and 3.5.2) for flight crew who have previously had Category II or Category III acceptable flight crew experience may be considered.

3.6 **Low Visibility Take-Off with RVR less than 400 m**

3.6.1 All low visibility take-off less than 400 m requires CAD approval.

3.6.2 An operator must ensure that a flight crew member has completed a check before conducting Low Visibility Take-Offs in RVRs of less than 400 m.

3.7 **Low Visibility Take-Off with RVR less than 150/200 m**

3.7.1 An operator must ensure that prior to authorisation to conduct take-offs in RVRs below 150 m (below 200 m for Category D aeroplanes) additional training as below is carried out:-

(a) Normal take-off in minimum authorised RVR conditions;

(b) Take-off in minimum authorised RVR conditions with an engine failure between V1 and V2, or as soon as safety considerations permit; and

(c) Take-off in minimum authorised RVR conditions with an engine failure before V1 resulting in a rejected take-off.

3.7.2 An operator must ensure that the training required by subparagraphs 3.6.1 and 3.7.1 above is carried out in a flight simulator. This training must include the use of any special procedures and equipment.

3.7.3 An operator must ensure that a flight crew member has completed a check before conducting Low Visibility Take-Offs in RVRs of less than 150 m (less than 200 m for Cateogry D aeroplanes). The check may only be replaced by successful completion of the flight simulator and/or flight training prescribed in subparagraph 3.6.1 on conversion to an aeroplane type.

3.7.4 Operator using HUD/EVS equipment wishing to conduct LVTO has to obtain further approval from CAD.

3.8 **Recurrent training and checking – Low visibility operations**

3.8.1 An operator must ensure that, in conjunction with the normal recurrent training and operator proficiency checks, a pilot's knowledge and ability to perform the tasks associated with the particular category of operation, for which he/she is authorised is checked. The required number of approaches to be undertaken in the flight simulator within the validity period of the operators proficiency check (of a six month training cycle) is to be a minimum of two (four when HUDLS and/or EVS is utilised to touchdown), one of which must be a landing at the lowest approved RVR; in addition one (two for HUDLS and/or operations utilised EVS) of these approaches may be substituted by an approach and landing in the aeroplane using approved Category II and III procedures. One missed approach shall be flown during the conduct of the operators proficiency check. If the operator is authorised to conduct take-off with RVR less than 400 m at least one LVTO to the lowest applicable minima shall be flown during the conduct of the operators proficiency check.

3.8.2 For Category III operations an operator must use a flight simulator.

3.8.3 An operator must ensure that, for Category III operations on aeroplanes with a fail passive flight control system, a missed approach is completed at least once over the period of six consecutive operator proficiency checks as the result of an autopilot failure at or below decision height when the last reported RVR was 300 m or less.

3.8.4 The Authority may authorise recurrent training and checking for Category II and LVTO operations in an aeroplane type where no flight simulator to represent that specific aeroplane or an acceptable alternate is available.

Note: Recency for LVTO and Category II/III based upon automatic approaches and/or auto-lands is maintained by the recurrent training and checking as prescribed in this paragraph.

3.9 Additional training requirements for operators conducting Lower than Standard Category I, and Other than Standard Category II Operations.

3.9.1 Operators conducting Lower than Standard Category I operations shall comply with the requirements of Chapter 3 for Flight Crew Training applicable to Category II operations to include the requirements applicable to HUDLS (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be less than that required to complete Category II training utilising a HUD/HUDLS. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met and that at least one approach using Lower than Standard Category I minima is conducted at least once every 18 months.

3.9.2 Operators conducting Other than Standard Category II operations shall comply with the requirements of Chapter 3 for Flight Crew Training applicable to Category II operations to include the requirements applicable to HUDLS (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be less than that required to complete Category II training utilising a HUD/HUDLS. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met and that at least one approach using Other than Standard Category II minima is conducted at least once every 12 months.

3.9.3 Operators conducting approach operations utilising EVS with visibility 800 m (runway visibility 550 m) or less shall comply with the requirements of Chapter 3 for Flight Crew Training applicable to include the requirements applicable to HUD (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be less than that required to complete Category II training utilising a HUD. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met and that at least one approach utilising EVS is conducted at least once every 12 months.

CHAPTER 4 – OPERATING PROCEDURES

4.1 General

Low visibility operations include:

(a) manual take-off (with or without electronic guidance systems) or HUDLS/Hybrid HUD/HUDLS;

(b) auto-coupled approach to below DH, with manual flare, landing and rollout;

(c) approach flown with the use of a HUDLS/Hybrid HUD/HUDLS and/or EVS;

(d) auto-coupled approach followed by auto-flare, auto landing and manual roll-out; and

(e) auto-coupled approach followed by auto-flare, auto landing and auto-roll-out, when the applicable RVR is less than 400 m.

Note 1 : A hybrid system may be used with any of these modes of operations.

Note 2 : Other forms of guidance systems or displays may be certified and approved.

4.2 Procedures and operating instructions

4.2.1 The precise nature and scope of procedures and instructions given depend upon the airborne equipment used and the flight deck procedures followed. An operator must clearly define flight crew member duties during take-off, approach, flare, roll-out and missed approach in the Operations Manual. Particular emphasis must be placed on flight crew responsibilities during transition from non-visual conditions to visual conditions, and on the procedures to be used in deteriorating visibility or when failures occur. Special attention must be paid to the distribution of flight deck duties so as to ensure that the workload of the pilot making the decision to land or execute a missed approach enables him/her to devote himself/herself to supervision and the decision making process.

4.2.2 An operator must specify the detailed operating procedures and instructions in the Operations Manual. The instructions must be compatible with the limitations and mandatory procedures contained in the Aeroplane Flight Manual and cover the following items in particular:

(a) checks for the satisfactory functioning of the aeroplane equipment, both before departure and in flight;

(b) effect on minima caused by changes in the status of the ground installations and airborne equipment;

(c) procedures for the take-off, approach, flare, landing, roll-out and missed approach;

(d) procedures to be followed in the event of failures, warnings and other non-normal situations;

(e) the minimum visual reference required;

(f) the importance of correct seating and eye position;

(g) action which may be necessary arising from a deterioration of the visual reference;

(h) allocation of crew duties in the carrying out of the procedures according to subparagraphs (a) to (d) and (f) above, to allow the PIC to devote himself/herself mainly to supervision and decision making;

(i) Callouts may be accomplished by the flight crew or may be automatic (e.g., using synthetic voice call-outs or a tone system). Typical call-outs acceptable for Category II include the following:

- "1000 ft" [radio altitude (RA)],
- "500 ft" [radio altitude (RA)],
- "approaching minimums,"
- "at minimums," (as applicable),
- any pertinent visual reference(s) observed, and resulting crew action, as applicable (e.g., "runway in sight,... landing",

- key altitudes during flare, (e.g., 50, 30, 10) or AFGS mode transitions (e.g., flare, rollout), and

- as appropriate, auto spoiler, reverse thrust deployment and autobrake disconnect.

(i) Combinations of these calls may also be used as appropriate. In any event, the calls made by the flight crew should not conflict with the automatic systems or auto call-outs of the aircraft, and conversely the configuration selected for the aircraft should not conflict with expected call-outs to be made by the flight crew. Compatibility between the automatic call-outs and the crew call-outs must be ensured.

(ii) Also, call-outs should be specified to address any non-normal configurations, mode switches, failed modes, or other failures that could affect safe flight, continuation of the landing, or the accomplishment of a safe missed approach.

(j) The requirement for all height calls below 200 ft to be based on the radio altimeter and for one pilot to continue to monitor the aeroplane instruments until the landing is completed. Any use of crew initiated call-outs at altitudes below 100 ft during flare should ensure that the call-outs do not require undue concentration of the non-flying pilot on reading of the radar altimeter rather than monitoring the overall configuration of the aircraft, mode switching, and annunciations. Automatic altitude call-outs or tones are recommended for altitude awareness, at least at and after passing DA(H).

(k) the requirement for the ILS Sensitive Area (LSA) to be protected;

(l) the use of information relating to wind velocity, wind shear, turbulence, runway contamination and use of multiple RVR assessments;

(m) procedures to be used for:

(i) Lower than Standard Category I;

(ii) Other than Standard Category II;

(iii) approaches utilising EVS; and

(iv) practice approaches and landing on runways at which the full Category II or Category III aerodrome procedures are not in force;

(n) operating limitations resulting from airworthiness certification; and

(o) information on excessive deviation alert and the maximum deviation allowed from the ILS glide path and/or localiser:

(i) ILS localiser and glideslope signals are the primary means currently used for the determination of deviation from the desired path for Category II or III operations;

(ii) operator should be capable to detect excessive deviation of the aircraft laterally and vertically during approach, and laterally during rollout, as applicable;

(iii) any unacceptable deviation (greater than 1 dot down to 300 ft on the PFD) from the final approach course or specified glide path should result in a go-around as a safety procedure.

CHAPTER 5 – AERODROME AND GENERAL OPERATING RULES

5.1 Aerodrome

Before a runway can be regarded as suitable for Category II or III operations the following factors should be considered:

(a) Threshold Crossing Height (TCH);

(b) obstacle clearance including Obstacle Free Zone (OFZ);

(c) glide path angle;

(d) characteristics of the terrain on the approach;

(e) runway profile and dimensions;

(f) ILS installation in terms of conformity with ICAO standards and recommended practices;

(g) visual aids, their standards of performance and reliability;

(h) meteorological service and the assessment and dissemination of runway visual range information; and

(i) Air Traffic Control and Ground Movement Control. [e.g. availability of Advanced Surface Movement Guidance & Control System (A-SMGCS)].

The following criteria and requirements are related to Hong Kong aerodromes; foreign aerodromes at which Hong Kong operators intend to use Category II or III aerodrome operating minima are expected to meet similar standards.

5.2 Glidepath Angle

The normal glidepath angle is three degrees. The runway may be unsuitable for Category II or Category III operations if the glidepath angle is greater than three degrees.

5.3 Visual Aids

(a) Category II and III operations require enhanced aerodrome visual aids (see ICAO Annex 14).

(b) For a precision instrument runway, the runway striping has been modified to make it easier to feel exactly how much runway remains. The stripes are still at 500 feet intervals for the 3,000 feet from the threshold. The HIRL or MIRL turns amber for the 2,000 feet closest to the threshold. The centerline lighting has alternating red and white lights from 3,000 feet to 1,000 feet to go, and has all red lights in the 1,000 feet closest to the threshold

5.4 **Meteorological Requirements**

The aerodrome should be suitably equipped and manned to provide the pilot with meteorological information as laid down in ICAO Annex 3 and ICAO PANS - RAC.

5.5 Runway Visual Range. Runway visual range should be measured by automatic instruments at three positions along the runway covering the Touch Down Zone (TDZ), the Mid Point (MID) and the Roll Out (RO). Automatic displays should be provided to enable RVR to be passed to the pilot within 15 to 30 seconds of any change. The TDZ RVR should always be passed but values for MID and RO positions should normally only be passed either on request or when either or both values are :

(a) less than TDZ and less than 800 m, or

(b) less than 400 m.

5.6 **Control of Air and Ground Traffic**

5.6.1 Special procedures for the control of air and ground traffic in low visibility are required; such procedures are known as ATC Low Visibility Procedures (LVP). They are additional to and dependent on normal ATC procedures and are designed to satisfy the requirements of both Category II and III operations. LVP will normally be implemented when the RVR reduces to less than 550 m or when the cloud ceiling lowers to less than 200 ft. However, in deteriorating conditions an earlier decision to implement LVP may be made. Responsibility for the initiation (and subsequent cancellation) of LVP, will rest with ATC.

5.6.2 Warning to the use of ILS for LVO qualification/practice: There is no guarantee that the LSA is protected and thus the integrity of ILS signals cannot be promised owing to Localizer/Glidepath interference by inherent movements.

5.6.3 There are two basic principles on which LVP are based, first that the Obstacle Free Zone (OFZ) must remain free of obstacles during a Category II or III operation, and second, that the ILS Sensitive Area (LSA) must be protected to ensure the integrity of ILS signals. In practice, the LSA encompasses the OFZ with respect to ground movements and so one set of procedures satisfies both requirements.

5.6.4 When LVP are implemented all relevant aerodrome services are to be informed. When the RVR or cloud ceiling requires the application of LVPs, flight crews may assume that all promulgated aerodrome facilities are available and that safeguarding checks are complete. Any deficiencies will be notified to crews as soon as possible either by Radiotelephony or by arrival / departure terminal broadcasts (ATIS) and, if necessary, NOTAM.

5.6.5 The spacing between aeroplanes on final approach may have to be greater than normal to allow landed aeroplanes to clear the LSA before approaching aeroplanes reach 1 nm from touchdown. The aim will be to give landing clearance by 2 nm. If landing clearance cannot be given by 2 nm, pilots will be warned to expect 'late landing clearance' and the clearance to land or instruction to initiate a missed approach will be given by 1 nm. Landed or crossing traffic should clear the LSA without delay.

5.7 Rules for operational demonstration

The purpose of the operational demonstration is to determine or validate the use and effectiveness of the applicable aircraft flight guidance systems, flight crew procedures, maintenance programme and manuals applicable to the Category II/III programme being approved. Operational demonstration is to be carried out in weather conditions at, or above Category I minima.

5.7.1 At least 50 approaches and landings must be accomplished in operations using the Category II/III systems installed in each aircraft type if the requested DH is 50 ft or higher. If the DH is less than 50 ft, at least 100 approaches and landings will need to be accomplished unless otherwise approved by the CAD.

5.7.2 If an operator has different variants of the same type of aircraft utilizing the same basic flight control and display systems, or different basic flight control and display systems on the same type of aircraft, the operator must show that the various variants have satisfactory performance, but the operator need not conduct a full operational demonstration for each variant. The CAD may also accept a reduction of the number of approach and landings based on credit given for the experience gained by another operator with an AOC using the same aeroplane type or variant and procedures.

5.7.3 If the number of unsuccessful approaches exceeds 5% of the total (e.g. unsatisfactory landings, system disconnects) the evaluation programme must be extended in steps of at least 10 approaches and landings until the overall failure rate does not exceed 5%.

5.8 **Data collection for operational demonstrations**

Each applicant must develop a data collection method (e.g. a form to be used by the flight crew) to record approach and landing performance. The resulting data and a summary of the demonstration data shall be made available to the CAD for evaluation.

5.9 **Data analysis**

Unsatisfactory approaches and/or automatic landings shall be documented and analysed, through the Mandatory Occurrence Reporting (MOR) Scheme.

5.10 **Continuous monitoring**

5.10.1 After obtaining the initial authorisation, the operations must be continuously monitored by the operator to detect any undesirable trends before they become hazardous. Flight crew reports may be used to achieve this.

5.10.2 The following information must be retained for a period of 12 months:

(a) The total number of approaches, by aeroplane type, where the airborne Category II or III equipment was utilized to make satisfactory, actual or practice, approaches to the applicable Category II or III minima; and

(b) Reports of unsatisfactory approaches and/or automatic landings, by aerodrome and aeroplane registration, in the following categories:

(i) airborne equipment faults,

(ii) ground facility difficulties,

(iii) missed approaches because of ATC instructions, or

(iv) other reasons.

5.10.3 An operator must establish a procedure to monitor the performance of the automatic landing system of each aeroplane.

CHAPTER 6 – CERTIFICATION AND AUTHORISATION

6.1 The Aeroplane

6.1.1 Approval of an aeroplane registered in Hong Kong for Category II and III operations is effected by appropriate entries in the Flight Manual. The aeroplane's Certificate of Airworthiness remains valid for Category II and III operations only so long as compliance is established and maintained with all the conditions included in such entries.

6.2 The Aeroplane Operator

6.2.1 The Hong Kong operator's competence to adopt aerodrome operating minima for Category II or III operations is regarded as part of his general competence to secure the safe operation of the aeroplane and therefore subject to the normal Air Operator's Certificate procedure.

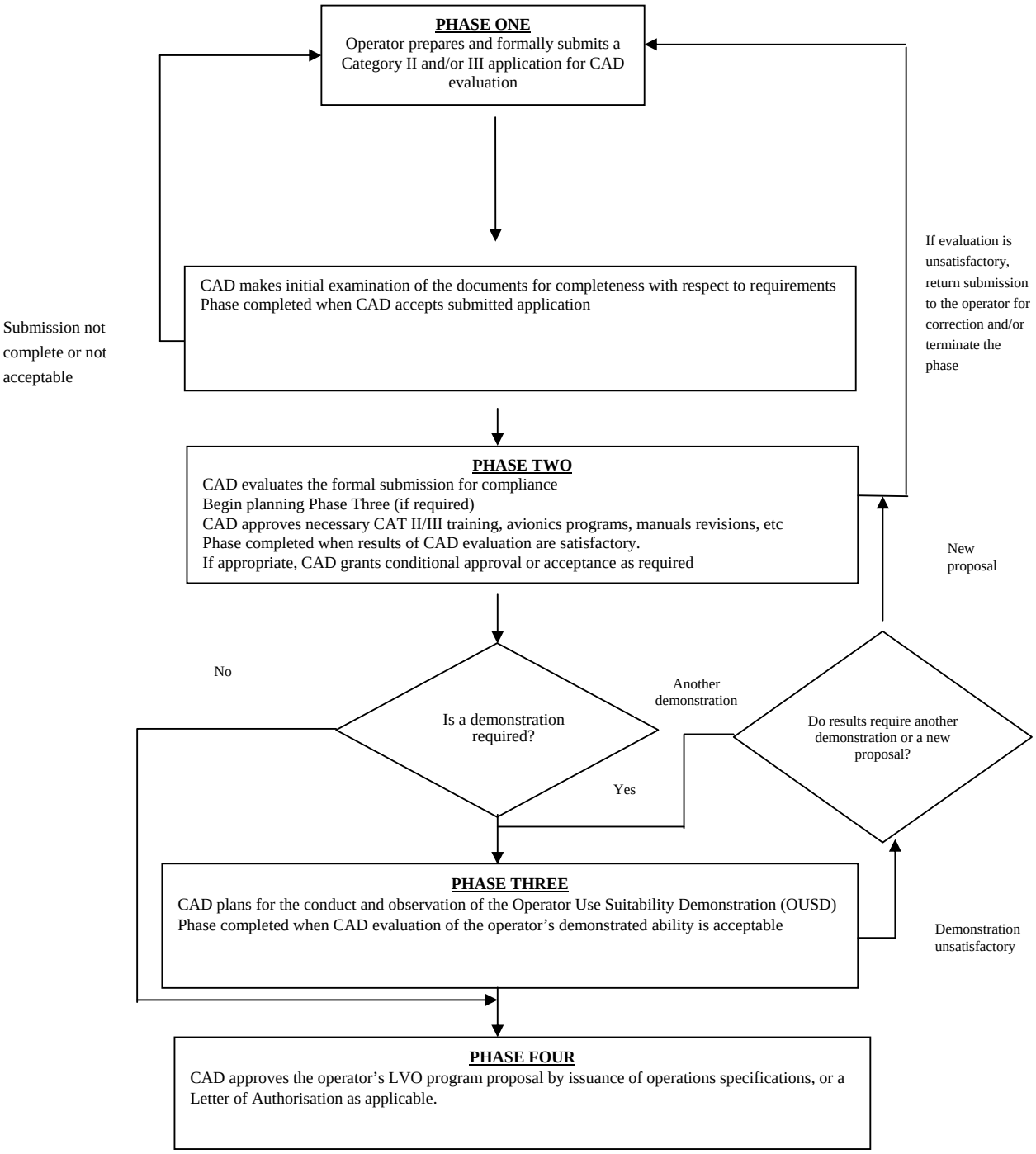
6.2.2 Category II or III operations at Hong Kong aerodromes by operators of aeroplanes not registered in Hong Kong will be considered under the requirements of the Air Navigation (Hong Kong) Order for the time being in force. Proposals should be addressed to the CAD.

6.2.3 Before carrying out Category II or III operations at a foreign aerodrome, a Hong Kong operator must have established that the ground installation and environment at the aerodrome, together with its airborne equipment and operating technique, comprise a system capable of supporting operations down to the proposed minima.

6.3 Approval Procedures

The general process of approval or acceptance of certain operations or procedure is an orderly method by CAD inspectors to ensure that such items meet regulatory standards and provide for safe operating practises. It is a modular process to approve CAT II/III programmes that are provided by operators to CAD. The process consists of four distinct phases and can result in approving or not approving an operator's CAT II and/or CAT III application. A flow diagram of the process is found below in Figure 6.4.

6.4 CAT II/III Evaluation and Approval Process Flow Diagram



6.5 **Phase One**

Phase One begins when the operator formally submits a CAT II and/or CAT III application for CAD evaluation. The onus is on the operator to produce these documents.

Note: This procedure is also applicable to Lower than CAT I application.

(a) The CAD inspector's first action in Phase One is to evaluate the operator's submission to ensure that the proposal is clearly defined, and the documentation specified in phase one has been provided. This examination should be accomplished in conjunction with Airworthiness Office. The required information must be complete and detailed enough to permit a thorough evaluation of the operator's capability and competence to fully satisfy the applicable regulations, and safe operating practices required to conduct CAT II/III operations.

(b) In complex cases, a meeting with the operator and its key personnel may be necessary to resolve issues and agree on a mutually acceptable solution. If mutual agreements cannot be reached, the CAD inspector will terminate the meeting, inform the operator that the submission is unacceptable, and return the submission.

(c) Phase One of the process is illustrated as follows:

- Operator submits application;
- CAD makes initial examination of the documents for completeness with respect to requirements;

OR

- CAD accepts submitted application.

6.6 **Phase Two**

Phase Two is the CAD detailed analysis, review, and evaluation of the operator's proposal.

(a) In Phase Two the CAD evaluation is focused on the form, content, and technical quality of the submitted application to determine that the information in the proposal meets the following criteria:

- Is not contrary to the direction provided in this document or other safety-related documents; and
- Provides for safe operating practices.

(b) Criteria for evaluating the formal application is found in Chapter 3, and follows the general guidance contained in the CAT II/III Job Aid. The CAD inspector will ensure that the documents adequately establish the operator's capability and competence to safely conduct CAT II/III operations in accordance with the submitted application.

(c) During Phase Two the CAD inspector will, address any deficiencies in the submitted material before proceeding to subsequent phases. Discussion with the operator may be sufficient to resolve certain discrepancies or questions or to obtain additional information. It may be necessary to return certain sections of the submission to the operator for specific changes. The evaluation of the applicant package is made easier by following the Job Aid below:

		CAT II/III APPROVAL JOB AID	**Seeking Authorization for:** CAT II ☐ CAT IIIA ☐ CAT IIIB ☐ CAT IIIC ☐
		OPERATOR NAME:	
			Date:
		Previous CAT II: Yes ☐ No ☐ CAT III: Yes ☐ No ☐	
4		FLIGHT OPERATIONS	Operator's Reference Document
	1	**OPERATOR PROCEDURES**	
	1.A	Type of Operation	
	1.B	CAT II and CAT III Instrument Approach Procedures	
	1.C	AFM/FOM/QRH Provisions, as applicable	
	1.D	Crew Coordination and Monitoring Procedures	
	1.E	Callouts	
	1.F	Use of DA (H) and MDA (H)[Fail Passive])	
	1.G	Use of Alert Height (AH)[Fail Active]	
	1.H	Crew Briefings	
	1.I	Configurations	
	1.J	Non-Normal Operations and Procedures	
	1.K	Special Environmental Considerations (as applicable)	
	1.L	Continuing CAT II/III Approaches in deteriorating Weather	
	1.M	Dispatch Planning and MEL/CDL Requirements	
	1.N	Aircraft System Suitability Demonstration (as required)	
	1.O	Operator Use Suitability Demonstration	
	1.P	Data Collection/Analysis for Airborne System Demonstrations	
	1.Q	Operational Procedure for Return to Service	
	2.	**CREW TRAINING AND CREW QUALIFICATION**	
	2.A	Initial Training	
	2.B	Recurrent Training/Qualification	
	2.C	Upgrade Training	
	2.D	Requalification Training	
	2.E	Recency of Experience	
	2.F	Differences Training	
	2.G	Simultaneous Training and Qualification for Cat II and III	
	2.H	Ground Training Curriculum Segment	
	2.I	Training of Surface Movement Guidance & Control	
	2.J	Flight Training Curriculum Segment	

	2.K	Maneuvers and procedures Document	
	2.L	Initial Qualification	
	2.M	Low Visibility Takeoff Qualification	
	2.N	Multiple Aircraft Type or Variant Qualification (as applicable)	
	2.O	Special Qualification Airports (as applicable)	
	2.P	High Limit Captain Procedures	
	2.Q	Line Checks	
	2.R	Crew Records and Notification System	
	2.S	Advanced Qualification Program	
	3.	**AIRPLANE AND EQUIPMENT**	
	3.A	Airborne Systems for Cat II	
	3.B	Airborne Systems for Cat III	
	3.C	Automatic Flight control and Landing Systems	
	3.D	Flight Director Systems	
	3.E	Head up Display Systems (as applicable)	
	3.F	Enhanced/Synthetic Vision Systems (as applicable)	
	3.G	Hybrid Displays (as applicable)	
	3.H	Required Navigation Performance (RNP)	
	4	**OPERATIONS SPECIFICATIONS**	
	4.A	Approval of CAT II/III Minima and Issuance of Operations Specifications	
	4.B	Operations Specifications Amendments	
	5	**OPERATOR'S DOCUMENT APPLICATION PACKAGE**	
	5.A	Aircraft Operations Manual (Pertinent parts)	
	5.B	Flight Operations Manual (Pertinent parts)	
	5.C	Compliance Documents	
	5.D	Flight Operations Training Manual	
	5.E	Requested Operations Specifications	
	5.F	Implementation Timetable	
	5.G	Minimum Equipment List (MEL)	
	5.H	Operator Use Suitability Demonstration (OUSD) Plan	
	5.I	Application Letter	

NOTE:

(a) Most of the submitted materials evaluated during Phase Two (Training Programs, Manuals, etc) shall be evaluated in accordance with the policy and requirement contained in the applicable sections of this handbook.

(b) Elements for Maintenance Requirements are included in Chapter 8.

(d) An important aspect of Phase Two is for CAD inspectors to begin planning the conduct of Phase Three. While evaluating the operator's formal submission, inspectors will begin to formulate plans to observe and evaluate the operator's ability to demonstrate their ability to conduct CAT II/II operations. These plans must be finalized before the actual demonstrations. Phase Two shall require that the CAD approve certain programs before conducting actual line operations in Phase Three. For example, in Phase Two the operator initiates CAD approved CAT II/III training and must have the avionics and airworthiness programs approved before conducting actual line operations.

(e) Phase Two is illustrated as follows:

- CAD evaluates the formal submission for compliance with the direction provided in this document, other safety-related documents and safe operating practices;

- When results of CAD evaluation are unsatisfactory, return submission to the operator for correction and/or terminate the phase;

- Begin planning Phase Three;

- CAD approves necessary CAT II/III training, avionics programs, manual revisions, etc;

- When results of CAD evaluation are satisfactory, proceed with Phase Three and if appropriate, grant conditional approval or acceptance as required.

6.7 **Phase Three**

Phase Three is referred to as the Operator Use Suitability Demonstration (OUSD) and is the line with operational evaluation of the operator's ability to conduct CAT II/III operations in accordance with the application evaluated in Phase Two.

(a) The CAD inspector responsible for overseeing the demonstration will evaluate any discrepancies in terms of its overall impact on the operator's ability and competency to conduct the proposed operation. The CAD inspector will stop the demonstration in Phase Three when gross deficiencies or unacceptable levels of performance are observed. The CAD Inspector will identify the phase of the general process for approval or acceptance to which the applicant must return, or decide to terminate the process entirely when it is clear that continuation would not result in approval or acceptance.

(b) The purpose of the Operator Use Suitability Demonstration (OUSD) is to demonstrate and validate the reliability and performance of Low Visibility Operations (LVO) in line operations consistent with the operational concepts specified in this publication. Demonstration requirements are established considering any applicability of previous operator service experience, experience with specific aircraft type by other operators, experience of crews of that operator and other such factors. The demonstration period should be at least six months long for each phase (CAT II and CAT III) to permit the CAD to evaluate the ability of the operator to maintain and operate its proposed LVO operation. During the demonstration period at least 10 percent of the required number of landings should be observed by an appropriately qualified CAD inspector.

(c) For CAT II/III at least 50 landings should be accomplished, at least a 95 percent success rate, in line operations using the CAT II or CAT III system installed in each aircraft type, if the requested DH is 50 ft or higher. The demonstration period should not be less than 6 months for operators seeking CAT II authorization. Experienced CAT II operators may operate new or upgraded aircraft types/systems, or derivative types, using reduced length demonstration periods (e.g. less than 6 months/ 50 landings) when concurrence is received from the CAD inspector.

(d) For CAT III, with the DH less than 50 ft, at least 100 successful landings should be accomplished, unless otherwise approved by the CAD, in line operations using the low visibility landing system installed in each aircraft type applicable to the CAT III authorization. Demonstrations may be conducted in line operations, during training flights, or during aircraft type or route proving runs. The demonstration period should run for six months. Therefore, if an operator seeks CAT II initially and then CAT III subsequently, the total demonstration period will be 12 months.

(e) If an excessive number of failures that exceeds 5% of the total (e.g., unsatisfactory landings, system disconnects) occur during the landing demonstration program, a determination should be made for the need for additional demonstration landings (at least 10 approaches and landings) or for consideration of other remedial action (e.g., procedures adjustment, wind constraints, or system modifications).

(f) During the period, the operator must successfully complete a suitable operations demonstration and data collection program in line service for each type aircraft, as the final part of the approval process.

(g) An Autoland Discrepancy Form will be used, during the Demonstration Phase Three (OUSD) for the initial approval, by flight crew to record all unsatisfactory autoland approaches. An unsuccessful autoland is defined as follows:

- Aircraft fails to maintain runway track satisfactorily;
- Drift rate is excessive;
- Aircraft does not touch down within the touchdown zone;
- Auto Flight system does not maintain the aircraft within required performance parameters when within the Decision Region;
- Any other performance abnormality, e.g., early Auto disconnect, failure to ALIGN, failure to FLARE, failure to RETARD auto-throttles, or failure to ROLLOUT properly.

(h) Apart from making a logbook entry, all unsatisfactory autoland should be reported as a ASR to CAD for analysis/monitoring.

(i) A sample Autoland Discrepancy Form is as follows:

AUTOLAND DISCREPANCY FORM

This form will be completed whenever an approach is attempted using the airborne low approach system, regardless of whether the approach is abandoned or concluded successfully.

CAT II/III APPROACH EVALUATION

Other than CAT II ☐ CAT II ☐ CAT III ☐ Autoland Yes ☐ No ☐

Pilot-in-Command (PIC) _____

Co-pilot _____

Date _____ Registration No._____ Airport ICAO Code _____

Rwy _____ Wx _____ Wind _____

APPROACH EVALUATION:

Was the approach successful? Yes_____ No _____

Flight control guidance system used:

Auto-coupler _____

Flight director_____

Airspeed at middle marker± at _____100' ±_____ from programmed speed?

If unable to initiate_____ or complete_____ approach (indicate which), indicate the cause:

Airborne equipment_____ Identify and describe nature of deficiency. _____

_____

_____

Ground equipment _____ Identify and describe nature of deficiency._____

_____

_____

ATC _____

Other _____ State reason:

Criteria of this form
AUTOLAND CRITERIA

An unsuccessful autoland is defined as follows:

1. Aircraft fails to maintain runway track within +/- 22 feet of centerline;
2. Drift rate exceeds 2 feet per second;
3. Aircraft does not touch down within the touchdown zone;
4. Auto Flight system does not maintain the aircraft within required performance parameters when within the Decision Region;
5. Any other performance abnormality, e.g., early Auto Flight disconnect, failure to ALIGN, failure to FLARE, failure to RETARD autothrottles, or failure to ROLLOUT properly.

A logbook entry is required for any unsatisfactory autoland.

(j) If the CAD evaluation of the operator's demonstrated ability is acceptable, the process continues. Phase Three of the process is illustrated as follows:

- CAD plans for the conduct and observation of the demonstration
- Operator demonstrates ability
- Demonstration unsatisfactory
- OR
- Demonstration satisfactory

NOTE: An operator shall not, under any circumstances, be authorised or otherwise approved to conduct any particular operation until all airworthiness and operations requirements are met and the operator is clearly capable of conducting a safe operation in compliance with CAD regulations and safe operating practices.

6.8 **Phase Four**

In Phase Four CAD approves the operator's LVO program proposal. If the proposal is not approved or accepted, the operator is notified in Phase Two or Three. Approval is granted by issuance of operations specifications (to be incorporated together with the AOC "Ops Specs") and an Approval for LVO as applicable.

CHAPTER 7 – AERODROME OPERATING MINIMA

7.1 Take-off minima

7.1.1 General.

(a) Take-off minima established by the operator must be expressed as visibility or RVR limits, taking into account all relevant factors for each aerodrome planned to be used and the aeroplane characteristics. Where there is a specific need to see and avoid obstacles on departure and/or for a forced landing, additional conditions (e.g. ceiling) must be specified.

(b) The PIC shall not commence take-off unless the weather conditions at the aerodrome of departure are equal to or better than applicable minima for landing at that aerodrome unless a suitable take-off alternate aerodrome is available.

(c) When the reported meteorological visibility is below that required for take-off and RVR is not reported, a take-off may only be commenced if the PIC can determine that the RVR/visibility along the take-off runway is equal to or better than the required minimum.

(d) When no reported meteorological visibility or RVR is available, a take-off may only be commenced if the PIC can determine that the RVR/visibility along the take-off runway is equal to or better than the required minimum.

7.1.2 Visual reference. The take-off minima must be selected to ensure sufficient guidance to control the aeroplane in the event of both a discontinued take-off in adverse circumstances and a continued take-off after failure of the critical power unit.

7.1.3 Required RVR/visibility.

(a) For multi-engine aeroplanes, whose performance is such that, in the event of a critical power unit failure at any point during take-off, the aeroplane can either stop or continue the take-off to a height of 1,500 ft above the aerodrome while clearing obstacles by the required margins, the take-off minima established by an operator must be expressed as RVR/Visibility values not lower than those given in the following Table except as provided in paragraph 7.1.4, below:

RVR/visibility for take-off	
Facilities	RVR/visibility (Note 3)
Nil (day only)	500 m
Runway edge lighting and/or centreline markings	250/300 m (Notes 1 and 2)
Runway edge and centreline lighting	200/250 m (Note 1)
Runway edge and centreline lighting and multiple RVR information	150/200 m (Notes 1 and 4)

Note 1: The higher values apply to Category D aeroplanes, unless paragraph 3.7 is complied with.

Note 2: For night operations at least runway edge and runway end lights are required.

Note 3: The reported RVR/visibility value representative of the initial part of the take-off run can be replaced by pilot assessment.

Note 4: The required RVR value must be achieved for all of the relevant RVR reporting points with the exception given in Note 3 above.

(b) When reported RVR, or meteorological visibility is not available, the PIC shall not commence take-off unless he can determine that the actual conditions satisfy the applicable take-off minima.

7.1.4 Exceptions to subparagraph 7.1.3 (a) above:

The conduct of such operation by the operator using HUD/EVS system has to obtain a separate approval from CAD. Subject to the approval of the CAD, and provided the requirements in paragraphs (a) to (e) below have been satisfied, an operator may reduce the take-off minima to 125 m RVR (Category A, B and C aeroplanes) or 150 m RVR (Category D) aeroplanes when:

(a) low visibility procedures are in force;

(b) high intensity runway centreline lights spaced 15 m or less and high intensity edge lights spaced 60 m or less are in operation;

(c) flight crew members have satisfactorily completed training in a flight simulator;

(d) a 90 m visual segment is available from the cockpit at the start of the take-off run; and

(e) the required RVR value has been achieved for all of the relevant RVR reporting points.

7.2 Precision Approach – Category II Operations

7.2.1 General. A Category II operation is a precision instrument approach and landing using ILS or MLS with:

(a) A decision height below 200 ft but not lower than 100 ft; and

(b) A runway visual range of not less than 300 m.

7.2.2 Decision height. An operator must ensure that the decision height for a Category II operation is not lower than:

(a) The minimum decision height specified in the AFM, if stated;

(b) The minimum height to which the precision approach aid can be used without the required visual reference;

(c) The OCH/OCL for the category of aeroplane;

(d) The decision height to which the flight crew is authorised to operate; or

(e) 100 ft.

7.2.3 Visual Reference. A pilot may not continue an approach below the Category II decision height determined in accordance with subparagraph 7.2.2 above unless visual reference containing a segment of at least THREE consecutive lights being the centre line of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained. This visual reference must include a lateral element of the ground pattern, i.e. an approach lighting crossbar or the landing threshold or a barrette of the touchdown zone lighting.

7.2.4 Required RVR. The lowest minima to be used by an operator for Category II operations are:

RVR for Cat II approach v. DH		
Category II minima		
Decision height	Auto-coupled to below DH (see Note 1)	
	RVR/aeroplane Category A, B and C	RVR/aeroplane Category D
100 ft – 120 ft	300 m	300 m / 350m (see Note 2)
121 ft – 140 ft	400 m	400 m
141 ft and above	450 m	450 m

Note 1 : The reference to "auto-coupled to below DH" in this table means continued use of the automatic flight control system down to a height which is not greater than 80% of the applicable DH. Thus airworthiness requirements may, through minimum engagement height for the automatic flight control system, affect the DH to be applied.

Note 2 : 300 m may be used for a CAT D aeroplane conducting an autoland.

7.3 **Precision Approach – Category III Operations**

7.3.1 General Category III operations are subdivided as follows:

(a) Category III A operations. A precision instrument approach and landing using ILS or GPS with:

(i) A decision height lower than 100 ft; minimum decision height of 50 ft and

(ii) A runway visual range not less than 175 m.

(b) Category III B operations. A precision instrument approach and landing using ILS or GPS with:

(i) A decision height lower than 50 ft, minimum decision height of 15 ft and a runway visual range of not less than 125 m; or

(ii) No decision height and a runway visual range lower than 125 m but not less than 50 m.

(c) Category III C operations

(i) no decision height; and

(ii) no runway visual range.

Note : Where the decision height (DH) and runway visual range (RVR) do not fall within the same category, the RVR will determine in which category the operation is to be considered.

7.3.2 Decision height. For operations in which a decision height is used, an operator must ensure that the decision height is not lower than:

(a) The minimum decision height specified in the AFM, if stated;

(b) The minimum height to which the precision approach aid can be used without the required visual reference; or

(c) The decision height to which the flight crew is authorised to operate.

7.3.3 No decision height operations. Operations with no decision height may only be conducted if:

(a) The operation with no decision height is authorised in the AFM;

(b) The approach aid and the aerodrome facilities can support operations with no decision height; and

(c) The operator has an approval for CAT III B or CAT III C operations, with no decision height.

Note : In the case of a CAT III runway it may be assumed that operations with no decision height can be supported unless specifically restricted as published in the AIP or NOTAM.

7.3.4 Visual reference

(a) For Category IIIA operations, and for Category IIIB operations with fail-passive flight control systems, a pilot may not continue an approach below the decision height determined in accordance with subparagraph 7.3.2, above unless a visual reference containing a segment of at least three consecutive lights being the centreline of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained.

(b) For Category IIIB operations with fail-operational flight control systems using a decision height, a pilot may not continue an approach below the decision height, determined in accordance with subparagraph 7.3.2, above, unless a visual reference containing at least one centreline lights is attained and can be maintained.

(c) For Category IIIC operations with no decision height there is no requirement for visual contact with the runway prior to touchdown.

7.3.5 Required RVR. The lowest minima to be used by an operator for Category III operations are:

RVR for Cat III A & B approach v. DH and roll-out control/guidance system

Category III minima			
Approach Category	Decision height (ft) (Note 1)	Roll-out control/guidance system	RVR (m)
III A	Less than 100 ft	Not required	175 m
III B	Less than 100 ft	Fail-passive	150 m
III B	Less than 50 ft	Fail-passive	125 m
III B	no decision height	Fail-operational (Note 2)	50 m
Note 1: Flight control system redundancy is determined under CS-AWO on all weather operations by the minimum certificated decision height. Note 2: The fail operational system referred to, may consist of a fail operational hybrid system.			

7.4 **Conversion of reported meteorological visibility to RVR/CMV**

7.4.1 An operator must ensure that a meteorological visibility to RVR/CMV conversion is not used for calculating takeoff minima, Category II or III minima or when a reported RVR is available. If the RVR is reported as being above the maximum value assessed by the aerodrome operator, e.g. "RVR more than 1,500 m", it is not considered to be a reported RVR in this context and the Conversion Table may be used.

7.4.2 When converting meteorological visibility to RVR in all other circumstances than those in subparagraph 7.4.1 above, an operator must ensure that the following Table is used:

Conversion of Meteorological (Met) visibility to RVR/CMV		
Lighting elements in operation	RVR/CMV = Reported Met Visibility (multiply by a factor of:)	
	Day	Night
HI approach and runway lighting	1.5	2.0
Any type of lighting installation other than above	1.0	1.5
No lighting	1.0	Not applicable

7.5 **Failed or downgraded equipment – effect on landing minima**

<table>
<tr><td rowspan="2">Failed or downgraded equipment (Note 1)</td><td colspan="3">Effect on landing minima</td></tr>
<tr><td>CAT IIIB (Note 2)</td><td>CAT IIIA</td><td>CAT II</td></tr>
<tr><td>ILS stand-by transmitter</td><td colspan="2">Not allowed</td><td>No effect</td></tr>
<tr><td>Outer Marker</td><td colspan="3">(No effect if replaced by published equivalent position)</td></tr>
<tr><td>Middle marker</td><td colspan="3">No effect</td></tr>
<tr><td>Touchdown zone RVR assessment system</td><td colspan="3">May be temporarily replaced with midpoint RVR if approved by the State of the aerodrome. RVR may be reported by human observation</td></tr>
<tr><td>Midpoint or stop end RVR</td><td colspan="3">No effect</td></tr>
<tr><td>Anemometer for runway in use</td><td colspan="3">No effect if other ground source available</td></tr>
<tr><td>Ceilometer</td><td colspan="3">No effect</td></tr>
<tr><td>Approach lights</td><td colspan="2">Not allowed for operations with DH > 50 ft</td><td>Not allowed</td></tr>
<tr><td>Approach lights except the last 210 m</td><td colspan="2">No effect</td><td>Not allowed</td></tr>
<tr><td>Approach lights except the last 420 m</td><td colspan="3">No effect</td></tr>
<tr><td>Standby power for approach lights</td><td colspan="3">No effect</td></tr>
<tr><td>Whole runway light system</td><td colspan="3">Not allowed</td></tr>
<tr><td>Edge lights</td><td colspan="3">Day only; Night – not allowed</td></tr>
<tr><td>Centreline lights</td><td colspan="2">Day – RVR 300 m
Night – not allowed</td><td>Day – RVR 300 m
Night – 550 m</td></tr>
<tr><td>Centreline lights spacing increased to 30 m</td><td>RVR 150 m</td><td colspan="2">No effect</td></tr>
<tr><td>Touchdown zone lights</td><td>Day – RVR 200 m
Night – 300 m</td><td colspan="2">Day – RVR 300 m
Night – 550 m</td></tr>
<tr><td>Standby power for runway lights</td><td colspan="3">Not allowed</td></tr>
<tr><td>Taxiway light system</td><td colspan="3">No effect – except delays due to reduced movement rate</td></tr>
</table>

Note 1 : Conditions applicable to Table 7.5

(a) multiple failures of runway lights other than indicated in Table 7.5 are not acceptable.

(b) deficiencies of approach and runway lights are treated separately.

(c) Category II or III operations. A combination of deficiencies in runway lights and RVR assessment equipment is not allowed.

(d) Failures other than ILS affect RVR only and not DH.

Note 2 : For CAT IIIB operations with no DH, an operator shall ensure that, for aeroplanes authorised to conduct no DH operations with the lowest RVR limitations, the following applies in addition to the content of Table 7.5:

(a) RVR. At least one RVR value must be available at the aerodrome: unless specified otherwise by the State requirements.

(b) Runway lights

1. no runway edge lights, or no centre lights – Day – RVR 200 m; night – not allowed;

2. no TDZ lights – no restrictions;

3. no standby power to runway lights – Day – RVR 200 m; night – not allowed.

7.6 **Table of operationally equivalent values**

The following metres (m) to statute miles (mile (statute)) or feet (ft) values are deemed to be equivalent for operational purposes:

Visibility		RVR		
400 m	= ¼ mile (statute)	50 m	=	150 ft
800 m	= ½ mile (statute)	75 m	=	250 ft
1,200 m	= ¾ mile (statute)	100 m	=	300 ft
1,600 m	= 1 mile (statute)	150 m	=	500 ft
2,000 m	= 1¼ mile (statute)	175 m	=	600 ft
2,400 m	= 1½ mile (statute)	200 m	=	700 ft
2,800 m	= 1¾ mile (statute)	300 m	=	1,000 ft
3,200 m	= 2 mile (statute)	350 m	=	1,200 ft
3,600 m	= 2¼ mile (statute)	500 m	=	1,600 ft
4,000 m	= 2½ mile (statute)	550 m	=	1,800 ft
4,400 m	= 2¾ mile (statute)	600 m	=	2,000 ft
4,800 m	= 3 mile (statute)	800 m	=	2,400 ft
		1,000 m	=	3,000 ft
		1,200 m	=	4,000 ft
		1,600 m	=	5,000 ft

CHAPTER 8 – MAINTENANCE REQUIREMENTS

8.1 Introduction

In order for an operator to gain approval from Civil Aviation Department (CAD) to conduct Low Visibility Operations (LVO), certain maintenance related issues require assessment and formal acceptance prior to full approval being granted.

8.1.1 These issues are identified within six sections: Required Equipment, Control of Required Equipment, Identification of Required Equipment, Current Operational Status of System, System Reliability and Maintenance Personnel Qualification.

8.1.2 Each topic will be taken separately and discussed more fully.

8.2 Required Equipment

8.2.1 An operator, in liaison with the aeroplane manufacturer, must include in the Operations Manual a complete list of equipment/systems that must be installed and serviceable at the commencement of a Low Visibility Take Off or a Category II or III approach.

8.2.2 If this requirement is to be satisfied by the Minimum Equipment List (MEL), then such equipment/system must be clearly identified within that document, so that both the flight crew and maintenance personnel are under no uncertainty as to the capability of the aeroplane prior to dispatch.

8.3 Control of Required Equipment

8.3.1 The operators maintenance organisation must publish procedures that clearly set out the control of “critical equipment” in terms of all weather operations.

8.3.2 Such controls should take account of the modification or repair of the above equipment.

8.3.3 Any modification embodied in critical equipment must be done in agreement with the manufacturer and therefore would be covered by a Service Bulletin (S.B.). On some occasions this might not be possible (e.g. older aeroplanes). These cases will require the involvement and approval of CAD Airworthiness Section and would be classified as major modifications in accordance with HKAR-1 sub-section 1.2-5. Adequate and appropriate justification would have to be supplied by the operator for CAD to adopt the latter option.

8.3.4 Any repair accomplished on critical equipment must be undertaken by maintenance organisations accepted in accordance with H.K. Airworthiness Notice No.17 Appendix No.1 in the appropriate category and carried out to approved maintenance instructions.

8.4 Identification of Required Equipment

8.4.1 The equipment classified as critical in paragraph 7.2 must be clearly identified to maintenance personnel.

8.4.2 Whist it is accepted that modern jet transports have a fully integrated autoflight/autoland system installed at build and included in type certification, older aeroplanes have varying capabilities of autoland and greater attention should be paid to these aeroplanes.

8.4.3 Identification is especially important when operating a mixed fleet (with regard to autoland capability) or when an operator contracts out its maintenance to a third party maintenance organisation.

8.4.4 Third party maintenance organisations, by their very nature, undertake work for several operators often simultaneously thus increasing the possibility of inappropriate equipment finding its way onto an aeroplane.

8.4.5 Operators should individually identify all applicable pieces of equipment or put in place a procedure/system that ensures maintenance personnel only install appropriate equipment onto their aeroplane.

8.5 Current Operational Status of System

8.5.1 There will be occasions when the autoland system will have to be downgraded from Category III to Category II or I.

8.5.2 Such occasions would be poor performance of the aeroplane, integrity or serviceability of the aeroplane systems and the non availability of appropriately trained and qualified maintenance personnel.

8.5.3 The regrading of the autoland system can be looked at as two distinct activities, the “downgrading” as mentioned above and the subsequent “upgrading” after corrective actions have been accomplished.

8.5.4 It is very important that provisions should be made to inform the flight crew of the Category II or III status of the aeroplane before dispatch. There will be occasions when the system has been downgraded but the automatic flight deck display systems indicate a Category III capability so this, in isolation, cannot be accepted as meeting the requirement.

8.5.5 The operator must publish procedures, in liaison with the manufacturer approved by CAD, that fully details when and how regrading should take place.

8.6 System Reliability

8.6.1 Aeroplanes certificated in accordance with European Aviation Safety Agency (EASA) CS-25 cross reference CS-AWO is an acceptable basis for showing compliance with the particular aspect of all Weather Operations.

8.6.2 As part of the In Service Proving (see Chapter 2 Paragraph 2.2) the system has to demonstrate a reliability equal to or better than that detailed in CS-AWO.

8.6.3 This reliability monitoring, in actual fact, is required to be a continuous process even after initial approval.

8.6.4 The data to be collected and utilised is :-

(a) the total number of approaches, by aeroplane type where a Category II or III approach/landing was made satisfactorily whether or not it was an actual or practice approach.

(b) Reports of unsatisfactory approaches/landings by aerodrome and aeroplane registration and categorised into (a) airborne equipment fault, (b) ground facility problem (c) missed approach due to ATC instruction and (d) other reasons.

8.6.5 The operator must establish a procedure to monitor the performance of the autoland system components of each aeroplane that detects any undesirable trend before it becomes hazardous. When setting alert levels in system reliability monitoring, consideration must be given to the levels or reliability assumed in qualifying the aeroplane for Category II or III operations.

8.6.6 Maintenance instructions for the Category II or III autoland equipment must be incorporated by the operator, in liaison with the manufacturer, and included in the Approved Maintenance Schedule (AMS) for the aeroplane.

8.7 Maintenance Personnel Qualification

8.7.1 HKAR-145 requires that for any aeroplane operated for Commercial Air Transport, a Certificate of Release to Service (CRS) must be issued by personnel authorised in accordance with HKAR-145.30 in association will form the basis of such an authorisation to issue certifications in respect of instruments or automatic pilots an aeroplanes which have an automatic landing capability.

8.7.2 Operators must ensure that when their maintenance organisation undertakes any work on the autoland system their personnel are appropriately qualified and authorised.

8.7.3 Many maintenance organisations have approved procedures that allow licensed/authorised personnel to undertake limited tasks normally associated with other trades. It is acceptable for the downgrading of the autoland system to be classified as a limited task.

8.7.4 The upgrading of an autoland system, however, must be performed and certified by an engineer specifically authorised and qualified as detailed above.

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