REPUBLICA DE CABO VERDE

AGÊNCIA DE AVIAÇÃO CIVIL

Instruction Nº 24/DSV/2015

SUBJECT: LOW VISIBILITY TAKE-OFF, CAT II AND CAT III APPROVAL

DATE: 24/09/2015

1. PURPOSE

1.1.1 This instruction provides instruction for Cabo Verde operator's approval for low visibility take-off, CAT II and CAT III approval.

2. APPLICABILITY

2.1.1 This instruction is applicable all operators of Cabo Verde registered aircraft planning to conduct for low visibility take-off, CAT II and CAT III operation. CAT II or CAT III approval will be granted only to operators of aircraft with the appropriate equipment and applying additional training, procedures and maintenance.

3. REFERENCES

- CV-CAR 8 and 7;
- ICAO Annex 6, Aircraft Operations;
- ICAO Doc 9365 Manual of All-Weather Operations.

4. DEFINITIONS AND ABBREVIATIONS

4.1.1 The following definitions are used throughout this circular:

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

(a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;

(b) landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of the operation;

(c) landing in approach and landing operations with vertical guidance, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H); and

(d) landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions.

(2) **Aeroplane.** a power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

(3) **Air operator certificate (AOC)**. a certificate authorizing an operator to carry out specified commercial air transport operations.

(4) **Aircraft -** any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

(5) **Aircraft flight technical record (maintenance log book).** record of all difficulties, failures, or malfunction identified on the aircraft, as well as any maintenance release of corrective action taken.

(6) **Alert height (AH).** a height above the runway threshold based on the characteristics of the aeroplane and its fail-operational landing system, above which a Category III operation would be discontinued and a missed approach initiated if a failure occurred in one of the redundant parts of the landing system, or in the relevant ground equipment.

(7) **All-weather operations.** any surface movement, take-off, departure, approach or landing operations in conditions where visual reference is limited by weather conditions.

(8) **Alternate aerodrome.** an aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing.

(9) **Approach ban policy.** Annex 6 specifies what has come to be known as an "approach ban policy" (commencement or continuation of the approach) to arriving aircraft when weather conditions are reported to be below landing minima. This policy is intended to facilitate the regularity of instrument approach operations, to prevent a landing/go-around decision at a low altitude and in a vulnerable condition, and to minimize unnecessary instrument approach operations where a successful landing would be highly unlikely. This approach ban limits aircraft from proceeding beyond a point, on an instrument approach procedure, which is 300 m (1 000 ft) above the aerodrome elevation or the beginning of the final approach segment unless weather conditions are reported at or above a specified minima. If weather deteriorates after an aircraft has passed the approach ban point, the policy may permit aircraft to continue, established on the approach, to DA/H or MDA/H.

(10) **Approach procedure with vertical guidance (APV)**. an instrument approach procedure which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations.

(11) **Automatic flight control system (AFCS) with coupled approach mode**. an airborne system which provides automatic control of the flight path of the aeroplane during approach.

(12) **Automatic landing or autolanding system**. The airborne system which provides automatic control of the aeroplane during the approach and landing.

(13) **Conformal view**. information which correctly overlays the image of the real world, irrespective of the pilot's viewing position.

(14) **Conformance report**. document submitted by the operator detailing how, with specific references to operations or maintenance manuals, it will comply with all applicable requirements. This type of document is referenced in Annex 6 and Doc 8335.

(15) **Decrab failure**. failure during aligning aircraft with the runway axis in crosswind landing operations

(16) **Decision altitude (DA) or decision height (DH).** A specified altitude or height in the precision approach or approach with vertical guidance at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

(a) Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.

(b) The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.

(c) For convenience where both expressions are used they may be written in the form “decision altitude/height” and abbreviated “DA/H”.

(17) **Fail-operational automatic landing system.** an automatic landing system is fail-operational if, in the event of a failure, the approach, flare and landing can be completed by the remaining part of the automatic system.

(18) **Fail-operational hybrid landing system.** A system which consists of two or more independent landing systems and in the event of failure of one system, guidance or control is provided by the remaining system(s) to permit completion of the landing.

Note.— A fail-operational hybrid landing system may consist of a fail-passive automatic landing system with a monitored head-up display which provides guidance to enable the pilot to complete the landing manually after failure of the automatic landing system.

(19) **Fail-operational System.** a system capable of completing the specified phases of an operation (e.g., landing, roll-out) following the failure of any single system component after passing a point designated by the applicable safety analysis (e.g., Alert Height).

(20) **Fail-passive System**. a system which, in the event of a failure, causes no significant deviation of aircraft flight path or attitude.

(21) **Final approach.** that part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,

(a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified or

(b) at the point of interception of the last track specified in the approach procedure and

(c) ends at a point in the vicinity of an aerodrome from which:

(i) a landing can be made or

(ii) a missed approach procedure is initiated.

(22) **Flight guidance system.** The means available to the flight crew to maneuver the aircraft in a specific manner either manually or automatically. It may include a number of components such as the autopilot, flight directors, relevant display and annunciation elements and it typically accepts inputs from the airborne navigation system.

(23) **Go-around.** a transition from an approach to a stabilized climb.

(24) **Height loss after go around**. height loss after an airplane has started a go-around maneuver.

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

(26) **Head-up display (HUD)** approach and landing guidance system (HUDLS).- An airborne instrument system which presents sufficient information and guidance in a specific area of the aircraft windshield, superimposed for a conformal view with the external visual scene, which permits the pilot to manoeuvre the aircraft manually by reference to that information and guidance alone to a level of performance and reliability that is acceptable for the category of operation concerned.

(27) **Hot standby status.** a method of redundancy in which the primary and secondary (i.e., backup) systems run simultaneously. The data is mirrored to the secondary system in real time so that both systems contain identical information.

(28) **Hybrid System.** a combination of two, or more, systems of dissimilar design used to perform a particular operation (e.g., a fail-passive autoland system used in combination with a monitored HUD flight guidance system).

(29) **ILS critical area.** an area of defined dimensions about the localizer and glide path antennas where vehicles, including aircraft, are excluded during all ILS operations. The critical area is protected because the presence of vehicles and/or aircraft inside its boundaries will cause unacceptable disturbance to the ILS signal-in-space.

(30) **ILS sensitive area.** an area extending beyond the critical area where the parking and/or movement of vehicles, including aircraft, is controlled to prevent the possibility of unacceptable interference to the ILS signal during ILS operations. Note.– The sensitive area is protected to provide protection against interference caused by large moving objects outside the critical area but still normally within the airfield boundary.

(31) **Instrument approach procedure.** 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 Non-precision approach (NPA) procedure, Approach procedure with vertical guidance (APV) and Precision approach (PA) procedure.

(32) **Instrument flight rules (IFR).** A set of rules governing the conduct of flight under instrument meteorological conditions. Instrument flight rules may be followed in both IMC and VMC.

(33) **Instrument meteorological conditions (IMC).** Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions.

(34) **Landing roll-out.** for the purpose of this AC, roll-out starts from the first contact of the wheels with the runway and finishes when the airplane has slowed to a safe taxi speed (in the order of 30 knots).

(35) **Low visibility procedures (LVP).** specific procedures applied at an aerodrome for the purpose of ensuring safe operations during Category II and III approaches and/or low visibility take-offs.

(36) **Minimum approach break-off height (MABH).** in some aeroplanes is the lowest height above the ground such that if a missed approach is initiated without external references in normal operation the aircraft does not touch the ground during the procedure; with an engine failure during a missed approach, it can be demonstrated that, taking this failure probability, an accident is extremely improbable.

(37) Missed approach procedure. the procedure to be followed if the approach cannot be continued.

(38) **Non-precision approach (NPA) procedure.** An instrument approach procedure which utilizes lateral guidance but does not utilize vertical guidance.

(39) **Non-visual aids.** the navigation aids or position-fixing systems (e.g. GNSS) used to assist the pilot in executing an approach and landing in clouds or limited visibility which prevents visual acquisition of the runway throughout much of the approach phase.

(40) **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.

(a) 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 approaches 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 is referenced to the aerodrome elevation.

(b) For convenience when both expressions are used they may be written in the form “obstacle clearance altitude/height” and abbreviated “OCA/H”.

(41) **Obstacle-free zone (OFZ).** the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.

(42) **Operations** specifications. the authorizations, conditions and limitations associated with the AOC and subject to the conditions in the operations manual.

(43) **Precision** approach (PA) procedure. an instrument approach procedure using precision lateral and vertical guidance, in the context of this AC provided by a ground-based navigation aid (ILS system), with minima as determined by the category of operation.

(a) **Category I (CAT I) operation**. A precision instrument approach and landing with:

(i) a decision height not lower than 60 m (200 ft) and

(ii) with either a visibility not less than 800 m or a runway visual range not less than 550 m.

(b) **Category II (CAT II) operation.** A precision instrument approach and landing with:

(i) a decision height lower than 60 m (200 ft), but not lower than 30 m (100 ft) and

(ii) a runway visual range not less than 300 m.

(c) **Category IIIA (CAT IIIA) operation**. A precision instrument approach and landing with:

(i) a decision height lower than 30 m (100 ft) or no decision height and

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

(d) **Category IIIB (CAT IIIB) operation.** A precision instrument approach and landing with:

(i) a decision height lower than 15 m (50 ft), or no decision height and

(ii) a runway visual range less than 175 m but not less than 50 m.

(e) **Category IIIC (CAT IIIC) operation.** A precision instrument approach and landing with no decision height and no runway visual range limitations.

(44) Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach and landing operation would be conducted in accordance with the requirements of the most demanding category (e.g. an operation with a DH in the range of CAT IIIA but with an RVR in the range of CAT IIIB would be considered a CAT IIIB operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation).

(45) **Procedure** turn. a manoeuvre in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track.

Note 1. Procedure turns are designated "left" or "right" according to the direction of the initial turn.

Note 2. Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual instrument approach procedure.

(46) **Runway visual range (RVR)**. the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

(a) RVR is considered to be an instrumentally derived value measured by transmissometers and is calibrated by reference to runway lights and/or the contrast of objects.

(b) Controlling RVR means the reported values of one or more RVR reporting locations (TDZ, mid, roll-out, or equivalent) used to determine whether operating minima are or are not met, for the purpose of approach initiation, or in some cases, approach continuation.

(c) RVR use has practical limitations that should be familiar to both the operator and pilot. For example, RVR is a value which typically only has meaning for the portions of the runway associated with the RVR report (TDZ, mid, or roll-out). RVR is a value that may vary with runway light step settings. RVR may not be representative of actual visibility along portions of the runway due to the location of the transmissometer baseline and limited length of the baseline, or due to variable conditions of fog, blowing snow, or other obscurations along the runway, or due to obscurations varying rapidly in time (e.g., patchy fog). Additionally, newer RVR systems may have localized performance sensitivity since they do not use a baseline along the runway (e.g., a scatter array may be used for visibility assessment). Thus, pilots and Operators should note that RVR is an instrumentally derived value that has operationally significant limitations and can be greater than or less than the actual visibility available to a pilot at typical flight deck eye height (ground level) at the runway. This is particularly true at night, if runway lights are not at settings standard for the prevailing conditions, or if unusual daylight conditions are experienced such as when a runway is aligned with a sunrise or sunset condition, in shallow or patchy fog.

(47) **State of Registry**. the State on whose register the aircraft is entered.

(48) **State of the Aerodrome.** the State in whose territory the aerodrome is located.

(49) **State of the Operator.** The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

(50) Statement of compliance:

(a) The initial statement of compliance should be a complete list of all AAC regulations applicable to the proposed operation. Each regulation, or sub-part, should be accompanied by a brief description or a reference to a manual or other document. The description or reference should describe the method of compliance in each case. The method of compliance may not be finalized at the time of the formal application, in which case a date should be given by which the final information will be provided. The purpose of the statement of compliance is to ensure that the applicant has addressed all regulatory requirements. It aids the AAC certification team to assess where the regulatory requirements have been addressed in the applicant's manuals, programmes and procedures. This type of document is referenced in Annex 6 and Doc 8335.

(b) The final statement of compliance needs to be completed and accepted by the AAC prior to the commencement of the flight operations inspection.

(51) **Touchdown zone (TDZ).** the portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway.

(52) **Transmissometer**. RVR measurements provider. Systems of calibrated transmissometer are strategically located to provide RVR measurements associated with three basic portions of a runway: the touchdown zone (TDZ), the mid-runway portion (MID) and the roll-out portion or stop end.

(53) **Visibility.** visibility for aeronautical purposes is the greater of:

(a) the greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognized when observed against a bright background;

(b) the greatest distance at which lights in the vicinity of 1000 candelas can be seen and identified against an unlit background.

Note 1. The two distances have different values in air of a given extinction coefficient, and the latter 2) varies with the background illumination. The former 1) is represented by the meteorological optical range (MOR).

Note. 2. The definition applies to the observations of visibility in local routine and special reports, to the observations of prevailing and minimum visibility reported in METAR and SPECI and to the observations of ground visibility.

(54) **Visual meteorological conditions (VMC).** meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima, as defined in annex 2.

4.1.2 The following abbreviations are used throughout this circular:

(1)	AAC	Agência de Aviação Civil de Cabo-Verde
(2)	AFCS	automatic flight control system
(3)	AFGS	automatic flight guidance system
(4)	AFM	aeroplane flight manual
(5)	AH	alert height
(6)	AIP	aeronautical information publication
(7)	AOC	air operator certificate
(8)	ATC	air traffic control
(9)	ATIS	automatic terminal information service
(10)	CV-CAR	Cabo Verde Civil Aviation Regulation
(11)	EADI	electronic attitude director indicator
(12)	EHSI	electronic horizontal situation indicator
(13)	FT	feet
(14)	HIS	horizontal situation indicator
(15)	HUD	head-up display (HUD)
(16)	HUDLS	head-up display approach and landing guidance system
(17)	IAC	instrument approach chart
(18)	IAS	indicated airspeed
(19)	ILS	instrument landing system

(20) IMC instrument meteorological conditions

(21) LVP low visibility procedures

(22) MABH minimum approach break-off height

(23) NOTAM notice to airman

(24) OCA obstacle clearance altitude

(25) OCA/Hobstacle clearance altitude/height

(26) OCH obstacle clearance height

(27) PFD primary flight display

(28) PIC pilot in command

(29) RA radio altimeter

(30) STC supplemental type certificate

(31) TAWS terrain awareness warning system

(32) TDZ touchdown zone

(33) Vat indicated airspeed at threshold

(34) VMC visual meteorological conditions

(35) Vso stall speed or minimum steady flight speed in the landing configuration

(36) Vs1g the one-G stall speed at which the airplane can develop a lift force equal to its weight

5. INTRODUCTION

5.1.1 Because of the complex nature of aircraft operations, there is a need to approach the subject of all-weather operations with a total-system concept. The major subsystems are the ground and airborne elements. The ground elements consist of facilities, services and obstacles; these relate, in principle, to the State of the Aerodrome. The airborne elements consist of the aircraft and its systems, which relate to the State of Registry, and flight crew capabilities and flight procedures, which fall under the jurisdiction of the State of the Operator.

5.1.2 The ICAO DOC 9365 Manual of All-Weather Operations describes the technical and operational factors associated with determination of aerodrome operating minima for surface movement, take-off, departure and instrument approaches, including Category I, II and III operations, to the lowest minima.

5.1.3 Aerodrome operating minima are usually expressed as a minimum altitude or height and a minimum visibility or RVR.

5.1.4 For approach and landing, aerodrome operating minima is an expression of the minimum altitude or height at which the decision to continue for landing or to execute a missed approach procedure should be made. They are also an indication of the minimum visibility in which the

pilot has to have the visual information necessary for continued control of the flight path of the aircraft during the visual phase of the approach, landing and roll-out.

5.1.5 As stated in Annex 6, an operator shall establish aerodrome operating minima for each aerodrome planned to be used. The method of determination of such minima must be approved by his authority. Except specific authorization, these minima shall be higher than any that may be established for such aerodromes by the state in which the aerodrome is located.

5.1.6 In this context, all values of aircraft airworthiness certification have to be considered as limits and the operational approval may introduce margins to ensure operational safety for every specific case.

6. GENERAL CONCEPTS

6.1.1 In establishing aerodrome operating minima for CAT II or CAT IIII operations, a large number of factors are involved which fall primarily into three groups as follows:

(1) ground environment

(a) design, maintenance and operation of ground equipment;

(b) the dimensions and characteristics of the runway which may be selected for use;

(c) the adequacy and performance of the available visual and non-visual aids; and

(d) the obstacles in the approach and missed approach areas and necessary clearance

(2) aircraft:

(a) the equipment available on the aeroplane for the purpose of navigation and/or control of the flight path, as appropriate, during the approach, the flare, the landing and the missed approach;

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

(c) the maintenance of the aeroplane and its equipment.

(3) operator:

(a) operating procedures;

(b) flight crew training and qualification; and

(c) the composition of the flight crew.

6.2 Visual aids

6.2.1 The length and shape of the approach lighting systems play an essential role in the determination of landing minima.

6.2.2 Visual aids are designed to increase the conspicuousness of the runway, provide visual references in the final stages of the approach and landing and expedite surface movement. The importance of visual aids increases as visibility becomes limited.

6.2.3 Approach lighting, runway center line lighting, runway edge lighting and runway markings provide a reference for the pilot to assess lateral position and cross-track velocity. The approach lighting and threshold lighting and markings provide a roll reference. Touchdown zone (TDZ) lighting and markings indicate the plane of the runway surface and show the touchdown area providing vertical and longitudinal references.

6.3 Aerodrome requirements

6.3.1 An operator will not use an aerodrome for CAT II or CAT III operations unless it is approved for such operations by the State of the Aerodrome.

6.3.2 Aerodrome requirements, such as aerodrome facilities, visual aids, non-visual aids, aerodrome services, surface movement, arrival and instrument approach procedures, are contained in All-Weather Operations Manual (Doc 9365), which refers to:

(1) Annex 3 — Meteorological Service for International Air Navigation, Manual of Aeronautical Meteorological Practice (Doc 8896) and the Manual of Runway Visual Range Observing and Reporting Practices (Doc 9328);

(2) Annex 10 — Aeronautical Telecommunications, Volume I — Radio Navigation Aids;

(3) Annex 11 — Air Traffic Services, the Air Traffic Services Planning Manual (Doc 9426) and PANS

(4) OPS — Aircraft Operations (Doc 8168), Volume II – Construction of Visual and Instrument Flight Procedures; and

(5) Annex 14 — Aerodromes, Volume I — Aerodrome design and operations, Aerodrome Design Manual (Doc 9157), Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476) and the Advanced Surface Movement Guidance and Control Systems (ASMGCS) Manual (Doc 9830).

6.3.3 It is expected that:

(1) The State of the aerodrome authorizes use of the facilities and services only if they meet the relevant ICAO specifications

(2) the appropriate OCA/H is published by the State of the aerodromes and;

(3) where the State of the Aerodrome has established an aerodrome operating minima policy and published in the AIP, the minima authorized for the use of an operator by the State of the Operator is not lower than the that minima, except where specifically authorized by the State of the Aerodrome.

6.4 Requirements regarding aircrafts and operators as discussed in this instruction

6.4.1 Aeroplane Categories.- Aeroplane performance has a direct effect on the airspace and visibility required for the various manoeuvres associated with the conduct of instrument approach procedures. The most significant performance factor is aeroplane speed.

6.4.2 Accordingly, categories of typical aeroplane have been established. These categories provide a standardized basis for relating aeroplane manoeuvrability to specific instrument approach procedures. For precision approach procedures, the dimensions of the aeroplane are also a

factor for the calculation of the obstacle clearance height (OCH). For Category D aeroplane, an additional obstacle clearance altitude/height (OCA/H) is provided, when necessary, to take into account the specific dimensions of these aeroplane:

(1) Category A — less than 169 km/h (91 kt) IAS

(2) Category B — 169 km/h (91 kt) or more but less than 224 km/h (121 kt) IAS

(3) Category C — 224 km/h (121 kt) or more but less than 261 km/h (141 kt) IAS

(4) Category D — 261 km/h (141 kt) or more but less than 307 km/h (166 kt) IAS

(5) Category E — 307 km/h (166 kt) or more but less than 391 km/h (211 kt) IAS

6.4.3 The criterion taken into consideration for the classification of aeroplanes by categories is the indicated airspeed at threshold (Vat), which is equal to the stall speed Vso multiplied by 1.3, or stall speed Vs1g multiplied by 1.23 in the landing configuration at the maximum certificated landing mass. If both Vso and Vs1g are available, the higher resulting Vat shall be applied.

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

6.4.5 The instrument approach chart (IAC) will specify the individual categories of aircraft for which the procedure is approved. Normally, procedures will be designed to provide protected airspace and obstacle clearance for aircraft up to and including Category D. However, where airspace requirements are critical, procedures may be restricted to lower speed categories.

6.5 Obstacle clearance

6.5.1 Obstacle clearance is a primary safety consideration in the development of instrument approach procedures.

6.5.2 For each individual approach procedure an obstacle clearance altitude/height (OCA/H) is calculated in the development of the procedure and published on the instrument approach chart. In the case of precision approach, an OCA/H is specified for each category of aircraft, based in the height of the highest approach obstacle or of the highest equivalent missed approach obstacle, whichever is greater.

6.5.3 However, from the operational point of view, it is stressed that the obstacle clearance applied in the development of each instrument approach procedure which is considered to be the minimum required for an acceptable level of safety in operations.

6.5.4 In general, minima are developed by adding the effect of operational factors to OCA/H to produce decision altitude (DA) or decision height (DH).

7. APPROVAL REQUIREMENTS

7.1 GENERAL APPROVAL REQUIREMENTS

7.1.1 There are five elements involved in the approval of an operation by the AAC as follows:

(1) **Authorization of the aeroplane and its equipment**. These are indicated by appropriate entries in the aircraft flight manual.

(2) **Authorization of the use of the aerodrome**. Air operators are responsible for determining the facilities available at the aerodrome meet the requirements of CV-CARs and shall ensure the following:

(a) The State of the Aerodrome authorizes use of the facilities and services;

(b) The appropriate Obstacle Clearance Altitude/Height (OCA/H) is published by the State of the Aerodrome; and

(c) Where the State of the Aerodrome has established an aerodrome operating minima policy and published landing and take-off minima in the AIP, the minima authorized for the use of an operator by the AAC will not be lower than the former, except where specifically authorized by the State of the Aerodrome.

(3) **Authorization of the flight crew**. Flight crews will be qualified to operate to the applicable aerodrome operating minima as follows:

(a) The pilot-in-command and co-pilot each hold a valid instrument rating and meet the requirements for recent experience established by CV-CARs;

(b) Flight crew members are qualified and trained for take-off, instrument approaches and operations for low visibility take-off, Category II and/or Category III operations, as applicable;

(c) Flight crew members have completed all required proficiency checks, including demonstration of proficiency for low visibility take-off and using the relevant types of instrument approaches;

(d) The pilot-in-command has the necessary experience in the aeroplane type with restricted (higher) minima before being authorized to use the lowest approved minima; and

(e) The operator maintains a system of records to ensure that the necessary qualifications of the flight crew members are being met on a continuing basis.

(4) **Authorization of the operation**. Before granting such an authorization, inspectors shall ensure that the operator has established a system to ensure that:

(a) pplicable aerodrome operating minima for the use of flight crews for all types of approaches to all aerodromes to be used in the operations have been determined;

(b) The proficiency of flight crews has been determined;

(c) Required operating procedures have been established;

(d) An operations manual with instructions appropriate to the intended operation and that reflect the mandatory procedures and/or limitations contained in the aircraft flight manual; and

(e) Sufficient experience has been gained by the air operator in operational service in weather minima higher than those proposed.

(5) **Authorization of minima**. CV-CAR 8 require an air operator establishing aerodrome-operating minima to have its method for determining such minima approved by the AAC.

Approval may be granted provided the operator's method for determining aerodrome-operating minima accurately accounts for:

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

(b) The composition and experience of the flight crew;

(c) The dimensions and characteristics of the runways selected for use;

(d) Aircraft equipment used for navigation and aircraft control during the approach to landing and the missed approach;

(e) Obstacles in the approach and missed approach areas and the obstacle clearance altitude/height for the intended instrument approach procedures;

(f) The means used to determine and report meteorological conditions;

(g) The obstacles in the climb out areas and the necessary clearance margins; and

(h) The adequacy and performance of the available visual and non-visual ground aids.

7.2 SPECIFIC APPROVAL REQUIREMENTS CATEGORY II/III

7.2.1 Aeroplane and its equipment

7.2.1.1 The instruments and equipment for Category II and III operations shall comply with the airworthiness requirements of the State of Registry of the aeroplane. In addition, aeroplane performance shall enable a missed approach to be carried out with an engine inoperative and without outside visual reference, from any height down to the decision height in Category II operations and down to touchdown in Category III operations, while remaining clear of obstacles. The instruments and equipment appropriate to various precision approach operations are outlined in CV-CAR 8. The MEL shall reflect the equipment required for low visibility operations.

7.2.1.2 The target level of safety and the acceptable frequency of missed approaches due to airborne equipment performance, in conjunction with the intended operating minima, determine the airborne equipment design requirements with regard to:

(1) System accuracy;

(2) Reliability;

(3) Characteristics in case of failures;

(4) Monitoring procedures and equipment; and

(5) Degree of redundancy can vary on an aircraft type and series. A determination must be made of the exact auto flight system installed. When an airline has a mixed fleet differences training is required. A determination that the full flight simulator used for crew training is exactly the same as that as installed on the actual aircraft.

Example:

On B737NG aircraft fitted with fail operational systems electrically operated rudder actuators, which receive inputs from their respective FCC, provide an alignment and rollout capability not present in fail passive aircraft. Rudder pedal movement and nose-wheel steering are provided by feedback through the rudder flight control system. Additional inertial information for the fail operational capability is provided by the Integrated Standby Flight Display (ISFD).

The ISFD provides the redundancy that a 3rd Autopilot would normally provide. The approach system failure matrix for fail operational equipped aircraft (contained in appropriate AFM) is slightly different than that for fail passive aircraft. One example is that if an engine fails on approach the dual channel approach and landing may be continued in a fail operational aircraft.

The fail operational system allows operation in CAT IIIB conditions if the operator and crew are approved. Whereas the fail passive system is restricted to CAT IIIA operations.

All Boeing 757 aircraft were manufactured with three autopilots and are Fail Operational Certified.

7.2.1.3 A reporting system shall be implemented to enable continual checks and periodic reviews during the operational evaluation period before the operator is authorized to conduct Category II and III operations. Furthermore, the reporting system will be used for the period defined by the AAC after the authorization has been given to ensure that the required standards of performance are maintained. The reporting system shall cover all successful and unsuccessful approaches, with reasons for the latter, and include a record of system component failures.

7.2.1.4 For Category II operations, air operators will differentiate between successful and unsuccessful approaches and provide a questionnaire to be completed by the flight crew to obtain data on actual or practice approaches which were not successful. As a minimum, the following data will be gathered to evaluate a Category II operation:

(1) The aerodrome and runway used;

(2) Weather conditions;

(3) Time;

(4) Reason for failure leading to an aborted approach;

(5) Adequacy of speed control;

(6) Trim at time of automatic flight control system disengagement;

(7) Compatibility of automatic flight control system;

(8) Flight director and raw data;

(9) An indication of the aeroplane's position relative to the ILS centre line and glide path when descending through 30 m (100 ft); and

(10) The number of approaches made during initial operational evaluation will vary depending on the capabilities of the aircraft and the operator's experience. A minimum of the AAC defined numbers of simulated approaches shall be completed to demonstrate that the performance of the system in commercial service is such that an adequate approach success rate will result. When determining the success rate, failures due to external factors, such as ATC instructions or ground equipment faults, should be taken into account.

The minimum number of approaches to be demonstrated to the AAC Flight Operations Inspection in the Full Flight Simulator is 20.

The minimum number of approaches to document in Line Operations is 20 with a 95% success rate.

7.2.1.5 For Category III similar but more stringent demonstration procedures will be followed. Use may be made of recording equipment such as a sophisticated flight data recorder to obtain the necessary data. Any landing irregularity will be fully investigated using all available data to determine its cause. Failure to positively identify and correct the cause of any landing reported to be unsatisfactory may jeopardize the future of the particular operation. A minimum of AAC defined numbers of simulated approaches will be conducted prior to approval being granted.

7.2.1.6 Aircraft manufacturer's design and certificate aircraft having CAT II and III operational capability. The automatic systems concept is described in type-certification requirements, including requirements for minimum system performance and failure conditions, flight demonstration during certification and information to be included in the aeroplane flight manual. Inspectors will confirm that the authorization being sought by the air operator is within the operational capability as outlined in the aircraft flight manual. Additional considerations for the certification of the aeroplane as a whole for approach and landing in restricted visibility must be included in the operators programme (e.g. experience and operational demonstration of performance).

7.2.1.7 The operator shall establish a maintenance programme to ensure that the airborne equipment continues to operate in service to the required performance level. This programme shall be capable of detecting any deterioration in the overall level of performance as described in 1.5.1.3 to 1.5.1.6.

7.2.1.8 Maintenance programmes shall be established consistent with the aeroplane manufacturer's recommendations. Aeroplane system design and architecture and the manufacturer's maintenance philosophy can introduce significant variation between aeroplane types for failure detection, annunciation and return-to-service methods.

7.2.2 Operating procedures

7.2.2.1 Low weather minima operations require special procedures and instructions to be included in the operations manual, but it is desirable that any such procedures should also be used as the basis for all operations in order to provide the same operating philosophy for all categories of operations. These procedures cover all foreseeable circumstances so that flight crews are fully informed as to the correct course of action which should be followed. This is particularly true for the last part of the approach and landing where limited time is available for decision making. Possible modes of operation include:

(1) Manual take-off;

(2) Manual approach and landing;

(3) Coupled approach down to DA/H, manual landing thereafter;

(4) Coupled approach to below DA/H, but manual flare and landing;

(5) Coupled approach followed by auto-flare and auto-landing; and

(6) Coupled approach followed by auto-flare, auto-landing and auto-roll-out.

7.2.2.2 The precise nature and scope of procedures and instructions shall be a function of the airborne equipment used and the flight deck procedure applied. The duties of flight crew members during take-off, approach, flare, roll-out and missed approach are to be clearly delineated in the operations manual. Particular emphasis shall be placed on flight crew responsibilities when transitioning from non-visual conditions to visual conditions and on procedures to be used in deteriorating visibility or when failures occur. Special attention should be paid to the distribution of flight deck duties to ensure that the workload of the pilot making the decision to land or to execute a missed approach enables the pilot to concentrate on flight management and decision-making.

7.2.2.3 The following areas are to be addressed in the operations manual:

(1) Checks for satisfactory functioning of equipment, both on the ground and in flight;

(2) Effects on minima caused by changes in the status of the ground installations;

(3) Use and application of RVR reports from multiple runway positions and sensors;

(4) Pilot assessment of aircraft position and monitoring of the performance of the automatic flight control system, the effects of the failure of any required portion of the automatic flight control system or instruments used with the system and action to be taken in the event of inadequate performance or failure of any portion of either the system or the associated instruments;

(5) Actions to be taken in the case of failures, such as engines, electrical systems, hydraulics and flight control systems;

(6) Allowable aeroplane equipment deficiencies;

(7) Precautions necessary when making practice approaches where full ATC procedures to support Category III operations are not in force;

(8) Operating limitations resulting from airworthiness certification; and

(9) Information on the maximum deviation allowed from the ILS glide path and/or localizer from the region of the DA/H down to touchdown, as well as guidance regarding the visual reference required.

7.2.2.4 Air operators will establish procedures for the gradual introduction of low weather minima operations. The procedures shall implement reduced visibility operations through a gradual reduction in meteorological criteria commensurate with experience. Such procedures will ensure the following:

(1) The practical evaluation of airborne equipment before commencing actual operations as outlined in 1.5.1.5 and 1.5.1.6;

(2) Accumulation of experience with the procedures discussed above before commencing actual operations and, if necessary, the adjustment of those procedures;

(3) Accumulation of operating experience before proceeding to Category III operations minima;

(4) Providing, for analysis purposes, a means of pilot reporting on ground and airborne system performance;

(5) Accumulation of flight crew experience; and

(6) Accumulation of experience in the maintenance of particular equipment.

Note: Procedures and limitations for all weather operations are contained in the operations manual.

7.2.3 Flight crew qualification and training

7.2.3.1 Before conducting Category II or III operations, the flight crew shall complete an approved programme of training and education. The approved programme of training will be related to the aeroplane type and the operating procedures adopted, as outlined in 1.5.2. For modern transport aircraft and operators, this is typically incorporated as part of the operator's approved flight crew training programme.

7.2.3.2 The increased dependence on the use of automatic systems highlights the role of the flight crew in safely and effectively operating these systems and the need for this role to be addressed in training and qualification processes. This emphasis should include pilot assessment of the position of the aeroplane and monitoring of the automatic flight control system performance throughout all phases of the approach, flare, touchdown and roll-out.

7.2.3.3 Flight crews shall be required to demonstrate their competency to the designated examiner or AAC inspector. The captain will have at least 500 hours as pilot-in-command in turbo-jet and 100 hours of pilot-in-command on the aeroplane type before being authorized by the air operator to apply Category II or III operations minima under actual conditions.

7.2.3.4 Flight crews shall make full use of ground and airborne equipment intended for use during Category II and III operations. They shall therefore be instructed in how to obtain maximum benefit from redundancy provided in the airborne equipment and to fully understand the limitations of the total system, including both ground and airborne elements. The ground instruction shall cover at least the following:

(1) The characteristics, capabilities and limitations of the NAVAIDs involved (e.g. ILS, GLS) including the effect on aeroplane system performance of interference to the ILS signal caused by other landing, departing or overflying aeroplanes and the effect of the infringement of ILS critical and sensitive areas by aeroplanes or vehicles in the manoeuvring area;

(2) The characteristics of the visual aids (e.g. approach lighting, touchdown zone lighting, centre line lighting) and the limitations on their use as visual cues in reduced visibility with various glide path angles and cockpit cut-off angles, and the heights at which various cues may be expected to become visible in actual operations;

(3) The operation, capabilities and limitations of the airborne systems (e.g. the automatic flight control systems, monitoring and warning devices, flight instruments including altimetry systems and the means the pilot has to assess the position of the aeroplane during the approach, touchdown and rollout);

(4) Approach, including missed approach procedures and techniques, along with descriptions of the factors affecting height loss during missed approach in normal and abnormal aeroplane configurations;

(5) The use and limitations of RVR, including the applicability of RVR readings from different positions on the runway, the different methods of assessing RVR, the conversion method of visibility into an RVR in some States and the limitations associated with each method;

(6) The basic understanding of obstacle limitation and the obstacle-free zone, including missed approach design criteria and obstacle clearance for Category II and III operations;

(7) The effects of low-level wind shear, turbulence and precipitation;

(8) Pilot tasks at decision height, and procedures and techniques for transition from instrument to visual flight in low visibility conditions, including the geometry of eye, wheel and antenna positions with reference to ILS reference datum height;

(9) Action to be taken if the visual reference becomes inadequate when the aeroplane is below decision height and the technique to be adopted for transition from visual to instrument flight should a go around become necessary at these low heights;

(10) Use of alert height and appropriate actions;

(11) Action to be taken in the event of failure of approach and landing equipment above and below decision height;

(12) Recognition of and action to be taken in the event of failure of ground equipment;

(13) Significant factors in the determination of decision height;

(14) Effect of specific aeroplane malfunctions (e.g. engine failure) on auto-throttle, auto-pilot performance;

(15) Procedures and precautions to be followed while taxiing during limited visibility conditions; and

(16) The existence and effects of visual illusions.

7.2.3.5 Each member of the flight crew shall be trained to carry out the duties appropriate to the particular airborne system and subsequently demonstrate their ability to carry out the duties, as a member of the flight crew, to an acceptable level of competency before being authorized to engage in the particular category of operations. Additionally, before a pilot is authorized to operate to Category II or III minima, the pilot shall have gained experience as outlined in 1.5.2.4 in using the appropriate procedures in meteorological conditions above the relevant minima. Flight crews shall be given practical training and tests in the use of applicable systems and associated procedures in conditions of the lowest minima to be authorized.

7.2.3.6 Training may only be carried out in an approved FSTD with a suitable visual system qualified for LVTO, CAT II and/or CAT III as applicable. It is important that the visibility simulated for both static and dynamic visual scenes is a correct reflection of the RVR intended. The specific type of training will depend upon the particular airborne system and on the operating procedures adopted. The initial training shall at least include:

(1) Approaches with all engines operating, and with an engine inoperative, using the appropriate flight guidance and control systems installed in the aeroplane down to the appropriate minimum height, without external visual reference, followed by transition to visual reference and landings;

(2) Approaches with all engines operating, and with an engine inoperative, using the appropriate flight guidance and control systems installed in the aeroplane down to the appropriate minimum height, followed by missed approaches, all without external visual reference;

(3) Approaches utilizing the automatic flight control and landing system, followed by reversion to manual control for flare and landing after disconnecting the automatic system at low level, if appropriate;

(4) Approaches utilizing the automatic flight control and landing system with automatic flare, automatic landing and, where appropriate, automatic roll-out;

(5) Procedures and techniques for reversion to instrument flight and the execution of a missed approach from DA/H, including obstacle clearance aspects; and

(6) Go-around from a height below decision height which may result in a touchdown on the runway in cases of a go-around initiated from a very low altitude, e.g. such as to simulate failures or loss of visual reference prior to touchdown.

7.2.3.7 The flight training programme shall provide practice in handling system faults, particularly those which have an effect on the operating minima and/or subsequent conduct of the operation. However, the frequency of system malfunctions introduced shall not be such so as to undermine the confidence of flight crews in the overall integrity and reliability of the systems used in low minima operations.

7.2.3.8 In conjunction with normal pilot proficiency checks at regular intervals, a pilot shall demonstrate the knowledge and ability necessary to perform the tasks associated with the authorized category of operation. The use of an approved FSTD for recurrent training, proficiency checking and renewal of authorizations is mandatory.

7.2.3.9 Air operators shall ensure that pilots use procedures developed for Category II or III operations during normal service, regardless of the weather conditions, when the necessary ground facilities are available and traffic conditions permit. This practice ensures flight crew familiarity with the procedures, builds confidence with the equipment and ensures appropriate maintenance of the Category II and III related systems.

7.2.3.10 When a flight crew member becomes fully qualified for Category II or III operations, the operator shall document these qualifications by either an endorsement in the pilot logbook or the issuance of a qualification card which shall contain evidence of recurrent checks.

7.3 SPECIFIC APPROVAL REQUIREMENTS LOW VISIBILITY TAKE-OFF

7.3.1 Take-off minima are usually stated as visibility or RVR limits. Where there is a specific need to see and avoid obstacles on departure, take-off minima may include cloud base limits. Where avoidance of such obstacles may be accomplished by alternate procedural means, such as use of climb gradients or specified departure paths, cloud base restrictions need not be applied.

7.3.2 While the State of the Aerodrome may establish standard take-off minima, low visibility take- off (LVTO) minima may also be established for aerodromes based on the availability of specified facilities and aerodrome procedures. The AAC may authorize the use of LVTO minima based on the following factors:

(1) Flight characteristics and cockpit instrumentation typical of multi-engine turbine aircraft;

(2) Comprehensive programmes for crew qualification which address use of the specified minima;

(3) Comprehensive programmes for airworthiness, with any necessary equipment operational (MEL);

(4) Availability of specified facilities for the respective minima, including programmes for assurance of the necessary reliability and integrity;

(5) Availability of air traffic services to ensure separation of aircraft and timely and accurate provision of weather, NOTAM and other safety information;

(6) Standard runway and airport configurations, obstruction clearance, surrounding terrain, and other characteristics typical of major facilities serving scheduled international operations;

(7) Routine low visibility weather conditions (e.g. fog, precipitation, haze, wind components) which do not require special consideration; and

(8) Availability of alternate courses of action in the event of emergency situations.

7.3.3 Air operators requesting authorization for LVTO at aerodromes where these may be available may make application to the AAC. The application will be approved provided the air operator can adequately demonstrate that each of the factors outlined above has been addressed.

7.3.4 The air operator may be authorized to the LVTO minima outlined in 1.6.5 below provided these minima are authorized by the State of the Aerodrome for that particular aerodrome.

7.3.5 Approved take-off minima for commercial air transport aeroplanes:

Facilities	**RVR/VIS1**
Adequate visual reference (day only) *(2)*	500 m/1 600 ft
Runway edge lights or runway centre line markings *(3)*	400 m/1 200 ft
Runway edge lights and runway centre line markings *(3)*	300 m/1 000 ft
Runway edge lights and runway centre line lights	200 m/600 ft
Runway edge lights and runway centre line lights and relevant RVR information *(4)*	TDZ 150 m/500 ft MID 150 m/500 ft Stop-end 150
High intensity runway edge lights and runway centre line lights (spacing 15 m or less) and relevant RVR information *(4)*	TDZ 125 m/400 ft MID 125 m/400 ft Stop-end 125
High intensity runway edge lights and runway centre line lights (spacing 15 m or less), approved lateral guidance system and relevant RVR information *(4)*	TDZ 75 m/300 ft MID 75 m/300 ft Stop-end 75 m/300

1 The TDZ RVR/VIS may be assessed by the pilot.
2 Adequate visual reference means that a pilot is able to continuously identify the take-off surface and maintain directional control.
3 For night operations at least runway edge lights or centre line lights and runway end lights are available.
4 The required RVR is achieved for all relevant RVRs.

7.3.6 Take-off minima, which are relevant to the take-off manoeuvre itself, should not be confused with weather minima required for flight initiation. For flight initiation, departure weather minima at an aerodrome shall not be less than the applicable minima for landing at that aerodrome

unless a suitable take-off alternate aerodrome is available. The take-off alternate aerodrome shall be located within the following distances of the aerodrome of departure:

(1) 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

(2) 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

(3) Aeroplanes engaged in extended diversion time operations (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 approved maximum diversion time considering the actual take-off mass.

8. AIRWORTHINESS AND OPERATIONAL APPROVAL PROCESS

8.1 Certification Process

8.1.1 Airspace where RVSM is applied should be considered special qualification airspace. Both the individual aircraft and the specific aircraft type or types that the operator intends to use will need to be approved by AAC before the operator conducts flights in RVSM airspace. Requirements of the CV-CAR shall be complied with for the approval of specific aircraft type or types and for airworthiness and operational approval.

8.1.2 Approval will encompass the following elements:

(1) Airworthiness aspects (including continued airworthiness);

(2) Operational requirements;

(3) Provision for height monitoring of operator's aircraft

8.1.3 On satisfactory compliance with the requirements given in the CV-CAR, the operator shall be given provisional approval for the specific aircraft. Approval may be regularized after the aircraft meets the Height Monitoring Performance using HMU/ GMU.

8.1.4 Prior to operating a civil aircraft of Cape Verde registry in RVSM airspace, aircraft operator(s) must first:

(1) Satisfactorily complete a certification process;

(2) Obtain an approval document for the specific aircraft or fleet from the AAC

8.1.5 The certification process is designed to ensure that prospective operators understand and are capable of fulfilling this duty. There are five (5) phases in the certification process:

(1) Pre-Application;

(2) Formal Application;

(3) Document Evaluation;

(4) Demonstration and Inspection;

(5) Certification Actions.

8.1.6 Pre-application phase

(1) This is the period of time before the formal application is submitted, when the applicant is developing the documentation and discussing the minimum requirements with the AAC inspector personnel.

(2) As far in advance as possible of an anticipated start of operations, a prospective operator should contact and inform the AAC of its intent to apply for an LVO approval. Usually the initial contact is by telephone, fax or a letter of intent;

(3) The AAC will schedule a pre-application meeting, where the AAC inspectors will discuss AAC's requirements and expectations in regard to approval to operate in an LVO environment. The content of the Operator's LVO application, AAC review and evaluation of the application, validation flight requirements, and conditions for removal of LVO approval shall be basic items of discussion.

(4) The AAC will designate one certification team member as the Project Manager (PM). The PM is the official AAC spokesperson throughout the certification project.

(5) The applicant will be required to submit, the AAC form FS.AER.46 application and required attachments for the LVO package.

(6) It is recommended that the formal application is submitted at least 90 days before LVO operations are expected to begin, although the application should be submitted to the AAC Authority as far in advance of the proposed start-up date as possible.

8.1.7 Formal Application

(1) The formal application fase begins when the operator submits the formal application, accompanied by all the relevant documentation, in accordance with FORMAL APPLICATION DOCUMENTATION paragraph bellow.

(2) The AAC will review the application to determine that it contains the required information and attachments. If there are omissions or errors, the formal application and all attachments will be returned with a letter outlining the reasons for its return. If the operator has a good understanding of the requirements, the formal application should be of sufficient quality to allow any omission, deficiency, or open question to be resolved during the formal application meeting.

8.1.8 Document Evaluation

(1) After the formal application has been accepted, inspectors will begin a thorough evaluation of all the manuals and documents that are required by regulation to be submitted to the AAC.

(2) If the content of the application is insufficient, AAC will ask for additional information from the Operator. When all the airworthiness and operational requirements of the application are met, AAC will proceed with the approval process.

(3) This phase is considered complete when all submitted documents have been evaluated and found to be acceptable for use in aviation; and

8.1.9 Demonstration and Inspection

(1) CV-CARs require an operator to demonstrate its ability to comply with regulations and safe operating practices before beginning actual operations.

(2) This is the period of time that the AAC conducts a series of inspections to determine that applicant's organization and personnel are qualified to conduct RVSM operations.

(3) The applicant's aircraft, support organizations and training will receive close scrutiny as they meet the requirements that will qualify them for the LVO operations

(4) When all other airworthiness and operational requirements of the application are met, the AAC will authorize validation flight(s).

8.1.9.2Validation Flight (s). In the demonstration phase the AOC holder's flight crews shall be evaluated by AAC Flight Operations Inspectors on the following:

(1) In a Full Flight Simulator have the flight crew identify and explain on taxi out with Category Two visibility:

(a) Hold Position on Taxiway located on runway approach and departure area

(b) ILS Critical Area

(c) No entry Area

(d) Edge of ILS Critical Area

(e) Land and Hold Short Intersection

(f) Stop Bar Lights

(g) Clearance Bar Lights

(2) In a Full Flight Simulator have the flight crew conducted at least 20 Category II approaches the different profiles. The Boeing 737NG has two autopilots and may be either Fail Passive or Fail Operational depending on auto flight system installed. All Boeing 757 aircraft have three autopilots and are Fail Operational. The following must be evaluated.

(a) All engine CAT II approach with autopilots to normal auto land.

(b) All engine CAT II approach with autopilots with loss of one RA inside OM

(c) All engine CAT II approach with autopilots with engine failure inside OM

(d) All engine CAT II approach with autopilots to a missed approach auto go around

(e) All engine CAT II approach with loss of one autopilot inside OM

(f) All engine CAT II approach with autopilot disconnect at DH with manual landing

(g) Vary RVR in touchdown, mid field, and rollout to demonstrate controlling

(h) Vary NOTAM runway lighting to demonstrate which is controlling

8.1.10 Certification Actions

(1) This is the period of time that the AAC completes the necessary documentation to formalize the approval of the applicant to conduct RVSM operations in specific aircraft type(s).

(2) LVO operational approval will only be issued if the LVO airworthiness approval is in force. The approval will take the form of a certificate and will identify the Operator, each individual aircraft the approval covers, and any conditions on the approval (e.g. height monitoring program to be completed within a specified time of the approval being issued).

(3) Once all requirements of this instructions have been met for the authorization requested, and demonstrations are satisfactorily observed by the AAC Inspectors in a Full Flight Simulators and actual auto lands observed on validation flights they shall authorize the operations through the issue of operations specifications for low visibility operations.

(4) The operations specification will include the applicable precision approach category (CAT II, IIIA, or IIIB) and minimum RVR in metres and decision height in feet. For low visibility take-off the operations specification will include the approved minimum take-off RVR in metres.

8.1.11 FORMAL APPLICATION DOCUMENTATION

(1) Airworthiness approval: aircraft must have the corresponding airworthiness approval as established in paragraph CAT II or CAT III AIRWORTHINESS APPROVAL of this AC.

(2) Application: the operator must submit the following application package to the AAC, at least 60 days prior to the intended operations.

(a) AAC application form to obtain CAT II or CAT III approval;

(b) aircraft qualification documentation: the documentation required to show that the proposed aircraft meets the airworthiness requirements;

(c) type of aircraft and description of the aircraft equipment to be used, as required by CV-CARs;

(d) operating procedures;

(e) training program for operations and maintenance personal, including crew qualification;

(f) operations manual and checklists: operators will submit the operations manuals and checklists containing information and guidance on CAT II or CAT III operations;

(g) aerodrome operating minima for each aerodrome intended to be used and method used to establish such minima;

(h) maintenance procedures for containing airworthiness and maintenance instructions concerning the systems and equipment to be used in the operation (maintenance manuals), as required by section 9 or 10 of this instruction.

(i) any revision to the MEL needed to conduct CAT II or CAT III operations;

(j) operational demonstration plan;

(k) Up-dated statement of compliance with the CV-CAR part 7 and 8

(l) Any other evidence necessary to show compliance with the airworthiness or operations approval requirements for the intended operations

9. CAT II AIRWORTHINESS APPROVAL

9.1 Aircraft requirements

9.1.1 The operator must establish a configuration list describing in detail the components, systems and equipment required for CAT II operations, according with airworthiness certification and as stated in the AFM or equivalent. Automatic landing capability is not required for CAT II operations, but operator must establish a configuration list describing in detail the components, systems and equipment required for autoland operations, according with airworthiness certification and as stated in the AFM, if has intention to do such operations.

9.1.2 In order to perform a CAT II approach and automatic landing as explained above, those components, systems and equipment are required to be operative.

9.1.3 The operator shall also include any promulgated limitations or procedures necessary for safe operation, such as:

(1) DA/H or AOM limitations;

(2) Minimum airborne equipment prior to commencement of the AWO approach;

(3) Equipment operating procedures and sequences;

(4) Aircraft performance data; and

(5) Any factors affecting the aeroplane AWO operations.

9.1.4 If one of those systems and equipment is listed in the operator MEL with associated dispatch conditions, the MEL must clearly indicate that CAT II or autolanding operations are not authorized.

9.1.5 In addition, aircraft performance should enable a missed approach to be carried out with an engine inoperative and without outside visual reference, from any height down to the decision height in CAT II operations, while remaining clear of obstacles.

9.1.6 For engine inoperative operations, the aircraft must have an appropriate reference to engine inoperative CAT II or automatic landing capability in the AFM.

9.1.7 The minimum aircraft equipment and instruments considered necessary for an authorization for CAT II is stablished by the CV-CAR Part 7, nevertheless the following equipment must be installed:

(1) Two independent ILS receivers, which may be provided as two or more integrated multi-sensor units;

(2) one or more marker beacon systems;

(3) a certified, suitable for the minima to be authorized, CAT II automatic flight control system (AFCS), with adequate coupled approach mode, or manual flight guidance system (e.g., head- up display approach and landing guidance system (HUDLS)), or both (e.g., flight director);

(4) at least 1 autopilot and at least dual flight director systems with an independent display for each pilot is recommended. Dual systems which provide the same information to both pilots, with the second system in "hot standby status" may be considered in accordance with this recommendation only if suitable comparison monitoring between the systems is available, and timely transfer to standby can be completed, and suitable annunciation to the flight crew is provided

(5) a radio altimeter display for each pilot. At least 2 independent radio altimeters with a display for each pilot are recommended;

(6) rain removal equipment is required for each pilot (e.g., windshield wiper, bleed air). (Note: hydrophobic coating is recommended for each applicable forward windshield, in lieu of rain repellent, due to environmental considerations) as well as ice protection and defog capability;

(7) flight instruments and annunciations which can reliably depict relevant aspects of the aircraft position relative to the approach path, attitude, altitude and speed, and aid in detecting and alerting the pilots in a timely manner to failures, abnormal lateral or vertical displacements during an approach, or excessive lateral deviation; and

(8) An auto-throttle system.

9.1.8 HUDLS used as the basis for suitable CAT II authorizations must provide guidance for one or both pilots as appropriate for the system design. If information is provided to only the flying pilot, then appropriate monitoring capability must be established for the non-flying pilot. Monitoring tasks must be identified, and the non-flying pilot must be able to assume control of the aircraft in the event of system failure or incapacitation of the pilot using the HUDLS (e.g., for a safe go-around or completion of roll-out).

9.1.9 Instruments, systems and displays:

(1) Instruments depicting attitude, barometric altitude, airspeed and vertical speed, or EADIs or PFDs, plus suitable standby attitude information must be provided for each required pilot;

(2) HSI, EHSIs or other equivalent navigation displays with pertinent, reliable, and readily understandable lateral situation information for both normal and non-normal conditions related to CAT II landing and missed approach procedures, must be provided for each required pilot;

(3) suitable redundant lateral and vertical displacement information must be provided on the PFD, EADI, ADI or equivalent to each pilot independently;

(4) DA/H advisory indications that are readily understandable and appropriately distinctive plus a display of RA and marker beacon indications (inner marker, middle marker, and outer marker), or equivalent, should be provided at each required pilot station. Advisory indications should be expressed as either "RA" for radio height and as "BARO" for barometric altitude. Flight deck depiction of radio and barometric height or altitude advisories should not typically use the operational designations of "DA", "DH" or "MDA";

(5) Appropriate system status and failure annunciations suited to the guidance systems used, navigation sensors used, and any related aircraft systems (e.g., autopilot, flight director, electrical system) should be provided;

(6) automatic audio call-outs are recommended; and

(7) annunciations must be clear, unambiguous, and appropriately related to the flight control mode in use. The mode annunciation labels should not be identified by landing minima classification. For example, APPROACH, LAND 2, LAND 3, Single Land, Dual Land, are acceptable mode annunciation labels, whereas, “Category II,” “Category III,” etc., should not be used. Aircraft previously demonstrated for Category I or II which do not meet this criteria may require additional operational constraints to ensure the correct use of minima suited to the aircraft configuration;

9.1.10 Airborne equipment used for approach should have appropriate interfaces with or compatibility with TAWS. This is to ensure nuisance free operation at routine airports. Special procedures may be used for non-normal procedures or at airports with unusually difficult underlying terrain, or other such factors.

9.1.11 Airborne equipment used for approach should have appropriate interfaces with or compatibility with flight data recorders, and if applicable cockpit voice recorders (e.g., alerting audio audibility on CVR)

9.2 Determining aircraft eligibility for CAT II

9.2.1 Operators shall provide to the AAC aircraft qualification documentation showing compliance with applicable airworthiness requirements. This documentation shall define the recommended CAT II and automatic landing maintenance procedures.

9.2.2 Notwithstanding the CV-CARs requirements, the documents bellow are generally accepted as a means of compliance for the airworthiness requirements for CAT II approach or automatic landing:

(1) EASA CS-AWO Subpart 2 (CAT II) and Subpart 1 (auto-land) or its previous regulations applicable at the time of certification or

(2) FAA AC 120-29A (CAT II) and AC 120-28D (auto-land) or its previous regulations applicable at the time of certification.

9.2.3 For aircraft that was produced with CAT II or automatic landing capability, the qualification documentation was approved by the State of Design/Manufacture as part of an aircraft type certification project and will be reflected in the AFM and related documents.

9.2.4 For aircraft that acquired CAT II or automatic landing capability in service, the qualification documentation typically refers to a modification approved by the State of Design and accepted by AAC, typically issued in a STC or an accepted STC).

9.2.5 If any aircraft system required for CAT II or automatic landing operations is installed or modified (i.e., software or hardware change), the aircraft installation or modification must be approved by the State of Design/Manufacturer and accepted by AAC and the operator must obtain a new operational approval supported by the manufacturer´s updated aircraft qualification and operational documentation.

9.3 Continued airworthiness

9.3.1 The operator who applies for CAT II or automatic landing operational approval shall submit to the AAC the maintenance manuals and a maintenance and inspection program that includes all those requirements of maintenance necessary, in accordance with type certificate holder's maintenance procedures, to ensure that the aircraft continue fulfilling the CAT II or autolanding approval criteria.

9.3.2 The operator must be aware that aircraft system design and architecture and the manufacturer's maintenance philosophy can introduce significant variation between aircraft types for failure detection, annunciation and return-to-service methods.

9.3.3 The maintenance manuals must be revised, as appropriate, to incorporate CAT II or automatic landing aspects and must address at least the following:

(1) procedures for maintenance, calibration and verification of the accuracy of the aircraft systems related to CAT II or automatic landing, in accordance with the type certificate holder's instructions for continuing airworthiness, and requirements included in the approved maintenance schedule;

(2) upgrading/downgrading procedures to assist the dispatch of the aircraft to assure CAT II or autolanding capacity;

(3) initial and recurrent training for all appropriate operator and contract personnel that have tasks related to CAT II or automatic landing maintenance schedule including aircraft flight technical record entries, placarding and returning to service criteria; Personnel considered to be included are maintenance personnel, quality and reliability groups, maintenance control, and incoming inspection and stores, or equivalent organisations and

(4) reliability monitoring program, which must incorporate the conditions and alert values for monitoring the degradation of the aircraft category for ILS Cat II and / or III operations and the procedures for reporting any exceedance.

9.3.4 The approved maintenance program for the affected aircrafts should include maintenance practices listed in maintenance manuals of the aircraft manufacturer and its components, and must consider:

(1) That equipment involved in the CAT II or automatic landing operation should be maintained according to directions given by manufacturer's components;
(2) that any amendment or change of components, systems and equipment affecting in any way CAT II or automatic landing initial approval must be forwarded and reviewed by the AAC for its acceptance or approval of such changes prior to its implementation;
(3) that any repair that is not included in the approved/accepted maintenance documentation, and that could affect CAT II or automatic landing operations, should be forwarded to the AAC for acceptance or approval;

9.3.5 The aircraft CAT II operational status must be downgraded (e.g., CAT II to CAT I), in accordance with the requirements of the AFM, the AFM supplement, instructions for continuing airworthiness or the MEL as appropriate, under any of the following conditions:

(1) the discovery of any defect to an aircraft system essential to CAT II operation;

(2) when the integrity of an aircraft system essential to CAT II operation is in doubt;

(3) when maintenance is undertaken that disturbs a system required for CAT II operation;

(4) when required by either the AFM, the AFM supplement, the MEL or a maintenance requirement, and the aircraft has not performed a successful approach in actual CAT II conditions or in VMC, or in IMC CAT I minima, conducted to CAT II minima, done with a fully capable and equipped airplane on a fully functioning facility with no aircraft or vehicle within the ILS sensitive area while following a procedure that is focused on annunciation, functionality and overall performance of the equipment during the previous thirty days by a CAT II qualified flight crew, which must be supported by an aircraft flight technical record entry.

Note: Although CAT II system certification on most modern aircrafts is maintained by performing a system ground check, some older generations of aircraft still require operational flight checks for CAT II. This option is intended for these older aircrafts and systems for which the performance of a successful CAT II approach during the previous 30 days is the preferred method to confirm systems operational suitability and for aircrafts and systems for which this option is allowed as an alternative to the system ground check in the AFM, AFM supplement, MEL or instructions for continuing airworthiness. Since these approaches may be done in conditions other than CAT II weather conditions, it is expected that the air operator will develop a procedure that will ensure that the appropriate level of safety (including monitoring for traffic in VMC) is maintained throughout the approach.

(5) when the flight crew reports an unsuccessful landing due to poor aircraft systems performance or

(6) when the aircraft has failed a CAT II required systems ground check.

9.3.6 The procedures specified in the AFM, the AFM supplement, and/or the MEL as appropriate, must apply in respect of downgrading the operational status of an aircraft, and information relating to the downgraded status, including the reason for downgrading, must be entered in the appropriate aircraft records.

9.3.7 Following downgrading and defect rectification, the aircraft CAT II system may be returned to a higher operational status, or to full operational status in accordance with the requirements of the AFM, the AFM supplement or the MEL as appropriate. In the absence of the preceding requirements, the aircraft CAT II system may be returned a higher operational status, or to full operational status by:

(1) an appropriate system ground check conducted in accordance with the applicable maintenance manual, and certified by the issuance of a maintenance release or

(2) a successful approach, as applicable, flown by a CAT II qualified flight crew in VMC, or in IMC not lower than CAT I minima, conducted to CAT II minima, or to an autoland as the case may be, done with a fully capable and equipped airplane on a fully functioning facility with no aircraft or vehicle within the ILS sensitive area while following a procedure that is focused on annunciation, functionality and overall performance of the equipment and certified by a statement to that effect entered in the appropriate aircraft records. Following CAT II systems upgrading and provided all appropriate certifications and related aircraft record entries have been made, the placard installed in respect of the downgrading must be removed or the status annunciator set to indicate the current operational status or

(3) successful completion of calendar criteria, as applicable.

9.3.8 A maintenance release statement for CAT II must be indicated according to operator policy and a prominent placard should be displayed on the aircraft and in the maintenance control room to inform flight operations of the current aircraft status.

10. CAT III AIRWORTHINESS APPROVAL

10.1.1 The airworthiness requirements specified for CAT II operations are applied for CAT III too, supplemented or modified by this section.

10.2 Aircraft requirements

10.2.1 Aircraft performance should enable a missed approach to be carried out with an engine inoperative and without outside visual reference, from any height down to touchdown in CAT III operations, while remaining clear of obstacles.

10.2.2 Automatic landing is mandatory for all CAT III operations.

10.2.3 For CAT III operations with DH not below 15m (50 ft) the landing system installed in the aircraft can be fail-passive or fail-passive hybrid.

10.2.4 For operations with DH below 15m (50 ft) is required a landing system with fail-operational capability.

10.2.5 For RVR less than 175 m a fail-operational roll-out control system is necessary.

10.2.6 The minimum aircraft equipment and instruments considered necessary for an authorization for CAT III is stablished by the CV-CAR part 7, nevertheless the following aircraft equipment must be installed:

(1) A redundant flight control system as required above.

(2) At least two independent navigation receivers/sensors providing lateral and vertical position or displacement information, typically with the first pilot's station receiving information from one and the second pilot's station receiving information from the other.

(3) At least two approved radio altimeter systems typically with the first pilot's station receiving information from one and the second pilot's station receiving information from the other.

(4) Failure detection, annunciation, and warning capability.

(5) Missed approach guidance provided by one or more of the following means:

(a) attitude displays which include suitable pitch attitude markings, or a pre-established computed pitch command display;

(b) an approved flight path angle display or;

(c) an automatic or flight guidance go-around capability.

10.3 Determining aircraft eligibility for CAT III

10.3.1 Notwithstanding the CV-CARs requirements, the documents bellow are generally accepted as a means of compliance for the airworthiness requirements for CAT III approach or automatic landing:

(1) EASA CS-AWO subpart 3 (CAT III) and subpart 1 (auto-land) or its previous regulations applicable at the time of certification or

(2) FAA AC 120-28D (CAT III and auto-land) or its previous regulations applicable at the time of certification.

10.4 Continued airworthiness

10.4.1 A reliability program should be developed/extended to monitor, track and control the CAT III operational status of the aircraft and to achieve at least 95% successful CAT III landings in real and/or simulated conditions.

11. CAT II OPERATIONAL APPROVAL

11.1 Aerodrome operating minima

11.1.1 To establish a DA/H for a particular CAT II operation, an operator must ensure it is not lower than:

(1) the minimum DA/H stated in the aeroplane airworthiness certification;

(2) the DA/H of the instrument approach procedure for the category of aeroplane;

(3) the DA/H to which the PIC is authorized to operate;

(4) 100ft (30m)

11.1.2 Additionally, the operational aspects below should be evaluated in order to obtain a DH suitable to operator environment, by, eventually, the addition of margin over the DH above determined.

(1) ground/airborne equipment characteristics;

(2) crew qualifications and experience;

(3) aircraft performance;

(4) meteorological conditions;

(5) aerodrome characteristics (e.g., if it is known that topographical features in a particular runway environment frequently produce downdraughts in the approach area, then the DA/H may be increased by 50 ft or more for propeller driven aeroplanes and by 100 ft or more for turbo-jet aeroplanes; a larger increment may be used if the downdraught is likely to be severe);

(6) terrain profile.

11.1.3 The RVR minimum of 300 m is applicable to Category II operations. However, larger aeroplanes may necessitate a greater RVR, unless use is made of an autoland system, thus making use of aircraft capabilities to increase safety.

11.1.4 If it is necessary to increase DA/H due to, for example, facility limitations or an increased OCH, then a corresponding increase in minimum RVR will be required.

11.1.5 The controlling RVR for CAT II is the TDZ RVR or equivalent. Mid and roll-out RVR are advisory.

11.1.6 Annex A must be used for determination of alternate aerodrome operating minima.

11.2 Operating procedures

11.2.1 Operators must develop specific CAT II procedures and operational instructions to be used by flight crews. These procedures and instructions must be published in the operations manual and it is desirable that any such procedures should also be used as the basis for all operations in order to provide the same operating philosophy for all categories of operations. All the instructions must be compatible with the limitations and mandatory procedures contained in the AFM.

11.2.2 The manual containing information and guidance on CAT II operations must be on board of the aircrafts.

11.2.3 The procedures and the operational instructions should cover normal and abnormal situations, which can be encountered in actual operations and following items must be covered:

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

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

(3) establishment of a safe height at which any adjustments to approach minima or procedures made on final approach should be completed at a safe height (e.g., 1700 ft);

(4) procedures for approach, flare, roll-out and missed approach;

(5) procedures to be followed in the event of failures, warnings and other abnormal situations;

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

(7) allocation of crew duties to allow the PIC to devote himself mainly to supervision and decision making;

(8) procedures for transfer of control between the pilots;

(9) minima for each CAT II approach;

(10) any increments to be added to the minima in the event of airborne or ground system deficiencies or failures;

(11) any increments to be added to the minima for use by the PIC recently converted to type or operating to an aerodrome for the first time, together with the period during which the increased minima should apply;

(12) authority for the PIC to apply higher values of minima as when judged to be required by circumstances;

(13) the minimum visual reference required;

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

(15) the “approach ban” policy;

(16) the requirement for all height calls below 200ft to be based on the RA and for one pilot to continue to monitor the aircraft instruments until the landing is completed

(17) the requirement for the localizer sensitive area to be protected;

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

(19) procedures to be used for practice approaches and landing on runways at which the full CAT II aerodrome procedures are not in force;

(20) operating limitations resulting from airworthiness certification;

(21) wind constraints;

(22) operational procedures should accommodate any authorized aircraft configurations (flap settings, alternate AFCS/AFGS modes or configurations, inoperative equipment provisions related to the minimum equipment list that might be required for CAT II approaches or missed approaches, use of auto brake system);

(23) information on the maximum deviation allowed from the ILS glide path or localizer;

(24) instructions for instrument approach procedures that have “Radio Altitude Not Authorized (RA NA)” (for example, due to irregular underlying terrain).

(a) Typically the first indication of arrival at the “inner marker” is used as a means to establish DA (H). However, an operator may elect to use first indication of arrival at either the “inner marker” or the barometric altitude DA, whichever comes first, as the means for minima determination.

(b) In the first instance, both radio altitude and barometric altitude are advisory.

(c) In the second instance barometric altitude may be an acceptable means to establish DA (H), but only if it occurs before arriving at the “inner marker.” When a procedure specifies “RA NA,” a DA (H) greater than 100 ft. HAT is typically not used, since a marker beacon is not located in a position along the approach path corresponding to that minima.

(d) Unless otherwise authorized for a particular airport, a suitable airport surface depiction should be available to flight crews for each regular, provisional, or alternate airport or any airport the operator could reasonably expect operations, to ensure appropriate identification of visual landmarks or lighting to safely accomplish taxing from the gate to the runway and from the runway to the gate. Airport depiction should be on an appropriate scale with suitable detailed information on gate locations, parking locations, holding locations, critical areas, obstacle free zones, taxi way identifications, runway identifications, and any applicable taxiway markings for designated holding spots or holding areas. Standard depictions provided by commercial charting services may be

acceptable if they provide sufficient detail to identify suitable routes of taxi to and from the runway and gate positions for departure or arrival.

11.3 Stabilized approach

11.3.1 Stabilized approach is a safe principle for any approach operations, however it must be emphasized for CAT II operations.

11.3.2 The primary safety consideration in the development of the stabilized approach procedure shall be maintenance of the intended flight path as depicted in the published approach procedure, without excessive maneuvering.

11.3.3 The parameters for the stabilized approach shall provide details regarding at least the following:

(1) range of speeds specific to each aircraft type;

(2) minimum power setting(s) specific to each aircraft type;

(3) range of attitudes specific to each aircraft type;

(4) crossing altitude deviation tolerances;

(5) configuration(s) specific to each aircraft type;

(6) maximum sink rate and

(7) completion of checklists and crew briefings.

11.3.4 In IMC, the flight shall be stabilized by no lower than 1000 ft height above threshold and, if not or has become destabilized at any subsequent point during an approach, a go-around is required. Operators should reinforce this policy through training.

11.4 Flight preparation

11.4.1 In addition to normal flight preparation, the following planning and preparation must be performed:

(1) review NOTAMs to make sure that the destination airport still meets visual or non-visual CAT II requirements regarding runway and approach lighting, radio navaid availability, RVR equipment availability, etc;

(2) Aircraft status: check that required equipment for CAT II approaches (according with airworthiness certification) are operative. Confirm on aircraft flight technical record that no write-up during previous flights affects equipment required for these operations. A maintenance release statement for CAT II must be indicated in the aircraft flight technical record.

(3) Crew qualification and currency must be reviewed (both PIC and co-pilot must be qualified and current).

(4) Check that the weather forecast at destination is within operator and crew operating minima. Verify that alternate weather forecasts are in accordance with alternate aerodrome

operating minima (this minima is derived from table on Annex A determined for the alternate(s) aerodrome(s).

(5) Fuel planning: additional extra fuel should be considered for possible approach delays.

11.5 Approach preparation

11.5.1 In addition to normal approach preparation, the following items must be considered:

(1) Aircraft status: verify that required landing capability is available, regarding equipments and systems and course of action if not.

(2) Check weather conditions at destination and at alternates.

(3) Review “approach ban” policy.

(4) Unless LVP are reported active by ATIS, clearance to carry out a CAT II approach must be requested from ATC, who will check the status of the ILS and lighting and protect the sensitive areas from incursion by aircraft or vehicles. Such an approach may not be undertaken until the clearance has been received.

(5) Before the outer marker, the required RVR values must be known.

(6) Review correct seat position.

(7) Use of landing light, since at night in low visibility conditions, landing lights can be detrimental to the acquisition of visual references.

(8) CAT II crew briefing: The briefing should include the normal items as for any IFR arrival and in addition the following subjects should be covered prior to the first approach:

(a) destination and alternate weather;

(b) aerodrome and runway operational status (CAT II / CAT III, etc);

(c) aircraft systems status and capacity;

(d) brief review of task sharing

(e) review approach procedure;

(f) review applicable minima, go-around procedure, ATC calls;

(g) brief review of procedure in case of malfunction below the determined safe height;

(h) optimum seat position and reminder to set cockpit lights when appropriate;

(i) review low visibility taxi procedures.

(9) Task sharing between crew members must be clearly defined in the operations manual. Whatever the operator policy, the AFM procedures must be observed. The following items should be observed in task sharing:

(a) Control of the aircraft, thrust levers and automatic flight control adjusts.

(b) Manual control in the event of AP disconnection.

(c) Flight instruments monitoring in all approach phases.

(d) Crew member assigned to look for visual references, before, at and below DH in order to assess the aircraft's position and its progress relative to the desired flight path during the transition from the instrument phase to the visual phase of the approach and during the subsequent descent to a landing. Associated call-outs (e.g., "LANDING" or "GO-AROUND FLAPS") regarding the decision to landing or go around should be specified. There should be too provisions about when and how (scan pattern may still include reference to the aircraft instruments below DH) look for visual references.

(e) In the decision to landing who will look outside and who will monitor the instruments (head-up and head-down).

(f) Call-outs associated with deviation or failure warning.

(g) Barometric heights call-outs, as required.

(h) Auto radio heights monitoring or radio heights call-outs.

(i) Approaching minima call-out (e.g. 100ft above the DH) in order to prevent inadvertent descent below the applicable descent limit.

(j) Call-outs related with auto spoiler, reverse deployment, autobrake, etc.

(k) Calls made by the flight crew should not conflict with the automatic systems or auto call-outs of the aircraft.

(l) A policy addressing procedures to be used when an automatic call-out system fails or is inoperative.

(m) Monitoring the auto flight systems modes annunciators.

(n) Actions at minimums including detection of pilot incapacitation and related call-outs.

(o) Actions and call-outs for decision to landing and go-around.

(10) Typical call-outs acceptable for CAT II include the following:

(a) "1000 ft." above the touchdown zone,

(b) "500 ft." above the touchdown zone,

(c) "approaching minimums,"

(d) "at minimums," as applicable,

(e) any pertinent visual reference(s) observed, and resulting crew action, as applicable (e.g., "runway in sight,... landing"),

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

(g) as appropriate, auto spoiler, reverse thrust deployment and autobrake disconnect.

11.6 Visual references

11.6.1 It should be stressed that the DH is the lower limit of the decision zone during which, in limiting conditions, one crew member will be assessing the visual references and should come to this zone prepared for a go around but with no pre-established judgement. This decision should be made according to the quality of the approach and the way the visual references develop as DH is approached

11.6.2 The conditions required at CAT II DH to continue the approach are that the visual references should be adequate to monitor the continued approach and landing, and that the flight path should be acceptable. If both these conditions are not satisfied, it is mandatory to initiate a go around. The visual references required at DH in CAT II operations to continue the approach may be any of the following:

(1) elements of the approach light system;

(2) the runway threshold, threshold markings or threshold lights;

(3) runway edge lights;

(4) the touchdown zone, touchdown zone markings or touchdown zone lights.

(5) Loss of visual references. The operations manual should have provisions for when the decision to continue has been made and the visual references subsequently become insufficient, or the flight path deviates unacceptably, both before and after touchdown. These provisions should take in account the following items:

(a) in which situations a go-around should be made or avoided;

(b) the possibility of touchdown after a go-around have been initiated and the effects of this on autopilot, auto-throttle, ground spoilers and autobrake systems, or equivalent systems, or other systems which affect aircraft control or performance;

(c) go-around with engine failure, including higher possibility to touchdown after go-around had been initiated;

(d) characteristics of autoflight system or guidance system during roll-out.

11.6.3 Operators should establish deviation limits for flight parameters such as IAS, rate of descent, pitch attitude, bank angle, localizer and glide slop indications; associated call-outs to be used and which crew member (or both) will do them. A height bellow which a go-around should be made in case of excessive deviation from these parameters should be established.

11.7 Failures and associated actions

11.7.1 The required procedures following failures during CAT II approaches are provided in the AFM.

11.7.2 In general there are three possible responses to the failure of any system, instrument or element during the approach and the nature of the failure and the point of its occurrence will determine which response is appropriate:

(1) continue the approach to the planned minima;

(2) revert to higher minima and proceed to a new DH;

(3) go around and reassess the capability

11.7.3 Must be established a safe height (e.g., 1700 ft), at which any adjustments to approach minima or procedures should be completed, otherwise, or if any failure occurs below it, will require a go- around, and a reassessment of the system capacity.

11.8 Training program and crew qualification

11.8.1 The flight crew required for CAT II operations must consist of a PIC and a copilot.

11.8.2 It is essential that flight crews are trained and qualified in all aspects of all-weather operations appropriate to the intended operations. This process is divided into two parts:

(1) ground instruction in the background and philosophy of all-weather operations.

(2) flight training which may be carried out in approved flight simulator and/or during airborne training.

11.8.3 The ground training program will address the following items:

(1) Ground facilities:

(a) The ILS and area protection (critical and sensitive).

(b) The visual aids (e.g., approach lights, touchdown zone and centerline, signs and markings).

(c) Transmissometer systems and the use and limitations of RVR assessment system.

(d) Runway light setting effects on reported RVR.

(e) Facility status, NOTAMs, or outage reports pertinent to use of CAT II minima.

(f) Recognition of and action to be taken in the event of failure of ground equipment.

(g) Pilot reporting of ILS anomalies, airport lights outage and other discrepancies which may be pertinent to CAT II approaches.

(2) The principles of obstacle clearance requirement.

(3) 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.

(4) The airborne system: the operational characteristics, capabilities and limitations appropriate to the CAT II system(s) utilized such as:

(a) automatic landing system,

(b) auto-throttle system,

(c) flight director system,

(d) instrumentation and display systems,

(e) systems and aircraft characteristics which determine the DH as applicable,

(f) other systems or devices peculiar to the particular installation (e.g., failure warning systems),

(g) description of the limits to which acceptable system performance has been demonstrated for wind and windshear.

(h) The effects of specific aircraft malfunctions.

(5) Review of operations specifications applicable to CAT II operations.

(6) Effects of meteorological conditions:

(a) The characteristics of fog.

(b) The effects of precipitation, ice accretion, low-level windshear and turbulence.

(c) Policies and procedures concerning the conduct of CAT II operations on icy or snow-covered runways, as well as those runways with braking action reported less than good.

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

(7) The importance of correct seating and eye position.

(8) The qualification requirements for pilots to obtain and retain approval to conduct CAT II operations.

11.8.4 Simulator and/or flight training program for CAT II are in the Annex B of this instruction.

11.8.5 Type and command experience: the following additional requirements are applicable to the pilots in command who are new to the type:

(1) 50 hours as PIC on the type before performing any CAT II operation.

(2) Until 100 hours as PIC on the type has been achieved, 100 m must be added to the applicable

(3) CAT II or III RVR minimum unless he has previously qualified for CAT II operations.

11.8.6 Flight crew qualification: an operator must ensure that a flight crew member has completed a check before conducting CAT II operations. Successful completion of the initial simulator and/or flight training will constitute the check. The limiting values of RVR and DH will be approved by the authority.

11.8.7 Recurrent training and checking: an operator must ensure that, in conjunction with the normal training and checking of pilot proficiency, a pilot's knowledge and ability to perform the tasks associated with the particular category of operation for which he is authorized is demonstrated. The required number of approaches to be conducted during such recurrent training is to be a minimum of two, one of which is to be a missed approach.

11.8.8 Each pilot or dispatcher, if applicable, having duties related to flight planning or use of CAT II instrument procedures is expected to have comprehensive knowledge of areas described above.

11.8.9 For crew members dual qualified between several aircraft types or variants, appropriate training and qualification must be completed to assure that each crew member can perform the assigned duties for each seat position and each aircraft type or variant.

11.8.10 When equipment interchange is involved, the PIC and the co-pilot are to receive sufficient ground and flight training to ensure complete familiarity and competence with the particular airborne CAT III system on the interchange aircraft. The amount of training required will depend on the differences in the flight control and display systems, and cockpit configuration.

11.9 Operational experience

11.9.1 Requirements for operational experience for CAT II are in the Annex C of this instruction.

12. CAT III OPERATIONAL APPROVAL

12.1 Aerodrome operating minima

12.1.1 The establishment of a DH is required for all fail-passive operations and for some fail-operational operations.

(1) To establish a DH for a particular CAT III operation, an operator must ensure it is not lower than:

(a) the minimum DA/H stated in the aeroplane airworthiness certification;

(b) the DA/H of the instrument approach procedure for the category of aeroplane;

(c) the DH airworthiness constraints referred to in this AC;

(d) the DA/H to which the PIC is authorized to operate.

12.1.2 Additionally, the operational aspects below should be evaluated in order to obtain a DH suitable to operator environment, by, eventually, the addition of margin over the DH above determined.

(1) ground/airborne equipment characteristics;

(2) crew qualifications and experience;

(3) aircraft performance;

(4) meteorological conditions;

(5) aerodrome characteristics (e.g., if it is known that topographical features in a particular runway environment frequently produce downdraughts in the approach area, then the DA/H may be increased by 50 ft or more for propeller driven aeroplanes and by 100 ft or more for turbo-jet aeroplanes; a larger increment may be used if the downdraught is likely to be severe);

(6) terrain profile.

12.1.3 If the minimum DH is not specified in the AFM, the height loss after go around initiation (e.g., MABH in some aeroplanes) can be used to determine the minimum DH.

12.1.4 Alert Height (AH).

(1) For CAT III fail-operational operations with no DH, an AH, at which the satisfactory operation of a fail-operational automatic landing system and relevant ground systems is confirmed, is specified.

(2) Alert height is a height specified for operational use by pilots (typically 100 ft or less above the threshold), above which a CAT III operation would be discontinued and a missed approach initiated if a failure occurred in one of the required redundant operational systems in the aeroplane or in the relevant ground equipment.

(3) Below this height, the approach, flare, touchdown and, if applicable, roll-out may be safely accomplished following any failure in the aircraft or associated Category III systems not shown to be extremely improbable. This height is based on characteristics of an aircraft and its particular fail-operational airborne Category III system.

(4) During airworthiness certification, alert heights are evaluated at or above 100 ft to assure sufficient system reliability and integrity. Operationally, alert heights are set at or below 100 ft to assure that conservative judgments are made when failure conditions occur.

12.1.5 For operations with no DH, the operation with no DH must be authorized in the AFM.

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

12.1.7 In those CAT III operations where DHs are used, specific DHs are associated with RVRs.

12.1.8 The RVR airworthiness constraints referred to in this AC must be observed by operator when establishing RVR minima.

12.1.9 RVR minima for CAT III approaches are a function of the aircraft available equipment and automatic landing system capability (fail-operational or fail-passive).

12.1.10 For CAT III landing minimums as low as 175 meters, the TDZ, mid, and roll-out RVR reporting systems are required and must be used. TDZ and mid RVR reports are controlling for all operations. The roll-out report provides advisory information to pilots.

12.1.11 For CAT III landing minimums below 175 meters, the TDZ, mid, and roll-out RVR reporting systems are required and are controlling for all operations.

12.1.12 Annex A must be used for determination of alternate aerodrome operating minima.

12.2 Operating procedures

12.2.1 The operating procedures and instructions specified for CAT II operations are applied for CAT III too, supplemented or modified by this section.

12.2.2 The procedures and the operational instructions should cover normal and abnormal situations, which can be encountered in actual operations and following items must be covered:

(1) The operator should assure that at each runway intended for Category III operations, the radar altimeter systems used to define Alert Height or Decision Height provides consistent, reliable, and appropriate readings for determination of Decision Height or Alert Height in the event of irregular terrain underlying the approach path or an alternate method should be used. Alert Height or DH may be based on other means (e.g., inner marker) only when specifically approved by AAC.

(2) a suitable airport surface depiction (e.g., airport diagrams) should be available to flight crews to assure appropriate identification of visual landmarks or lighting to safely accomplish taxing in Category III conditions from the gate to the runway and from the runway to the gate.

12.3 Task sharing

12.3.1 For CAT III operations with DH required (e.g. conducted either with fail-passive flight control systems), the crew member that will look for visual references. Associated call-outs (e.g. “LANDING” or “GO-AROUND FLAPS”) regarding the decision to landing or go around should be specified. There should be provisions about when and how look for visual references.

12.3.2 For CAT III operations without DH required:

(1) the tasks of each crew member before and at AH and associated call-outs (e.g. “LANDING” or “GO-AROUND FLAPS”) regarding the decision to landing or go around should be specified;

(2) how to monitor flare and lateral guidance during flare;

(3) how to monitor automatic ground roll, if applicable;

(4) procedures after a go-around.

12.4 Visual references

12.4.1 For Category III operations with DH (e.g. fail-passive operations), the requirement is for a view of runway touchdown zone lighting or markings which will give visual confirmation of the on-board system indications that the aircraft has been delivered accurately to the touchdown area of the runway and that a landing may safely be carried out.

12.4.2 For Category III operations without DH, the decision to continue does not depend on visual references, even though a minimum RVR is specified; the decision depends only on the operational status of the aircraft and ground equipment. The operations manual should states, however, that is good airmanship to confirm aircraft position with available visual references.

12.5 Failures and associated actions

12.5.1 Crew procedures which can reliably detect and alert the flight crew to abnormal lateral or vertical flight path performance during an approach to touchdown, or abnormal lateral performance during roll-out.

12.6 Training program and crew qualification

12.6.1 The training program and crew qualification specified for CAT II operations are applied for CAT III too, supplemented or modified by this section.

12.6.2 The ground training program.

(1) The importance and significance of alert height (AH), when applicable, and the action in the event of any failure above and below the AH.

(2) The airborne system: the operational characteristics, capabilities and limitations appropriate to the CAT III system(s) utilized such as systems and aircraft characteristics which determine the AH or DH as applicable,

12.6.3 Simulator and/or flight training program for CAT III are in the Annex B of this instructions.

12.7 Operational experience

12.7.1 Requirements for operational experience for CAT III are in the Annex C of this instructions.

AGÊNCIA DE AVIAÇÃO CIVIL
Civil Aviation Authority
Praia / Cabo Verde

João dos Reis Monteiro
President of the Board

ANNEX A - DESTINATION ALTERNATE AERODROME OPERATING MINIMA

1. The operator is authorized to derive alternate aerodrome weather minimums from the table listed below.

2. Special limitations and provisions.

   2.1. In no case shall the operator use an alternate airport weather minimum other than any applicable minimum derived from this table.

   2.2. In determining alternate airport weather minimums, the operator shall not use any published instrument approach procedure which specifies that alternate airport weather minimums are not authorized.

   2.3. Credit for alternate minima based on CAT II or CAT III capability is predicated on authorization for engine inoperative CAT III operations for the operator, aircraft type, and qualification of flight crew for the respective CAT II or CAT III minima applicable to the alternate airport.

Approach Facility Configuration	***Ceiling DA/H or MDA/H***	**Visibility**
For airports with at least one operational navigational facility providing a straight-in instrument approach procedure, or, when applicable, a circling maneuver from an instrument	Authorized DA/H or MDA/H plus an increment of 400 ft.	Authorized visibility plus an increment of 1500 m for these operations types.
For airports with at least two operational navigational facilities, each providing a straight-in instrument approach procedure to	Higher authorized DA/H or MDA/H plus an increment of 200 ft.	Higher authorized visibility of the two approach operations considered, plus an increment of 800 m.
For airports with a published CAT II or CAT III approach and landing operation, and at least two approach and landing operations, each providing a straight-in approach and landing	CAT II procedures, a ceiling of at least 300 ft, or for CAT III procedures, a ceiling of at least 200 ft.	CAT II, a visibility of at least RVR 1200 m or, for CAT III, a visibility of at least RVR 550 m

ANNEX B - SIMULATOR AND/OR FLIGHT TRAINING PROGRAM FOR CAT II AND III

1. The following items are to be covered on both initial training and at least annually during recurrent training/proficiency checks for both PIC and co-pilot:

   a) Determination of the DH, if a DH applies, including use of radio altimeter.

   b) Recognition of and proper reaction to significant failures encountered prior to and after reaching the AH or DH.

   c) Missed approach technique and expected height loss as it relates to manual or automatic go-around and initiation altitude.

   d) Runway Visual Range: its use and limitations, including the determination of controlling

   e) RVR and required transmissometers.

   f) The availability and limitations of visual cues encountered on approach both before and after DH, if applicable. This includes procedures for unexpected deterioration of conditions to less than minimum RVR encountered during approach, flare and roll-out, demonstration of expected visual references with weather at minimum conditions, and the expected sequence of visual cues during an approach in which visibility is at or above landing minima.

   g) The effects of vertical and horizontal windshear.

   h) Procedures for transitioning from non-visual to visual flight.

   i) Pilot recognition of the limits of acceptable aircraft position and flight path tracking during approach, flare, and, if applicable, roll-out.

   j) Pilot recognition of and reaction to airborne or ground system faults or abnormalities, particularly after passing AH or DH.

   k) Checks of satisfactory functioning of equipment, both on the ground and in flight.

   l) Effect on minima caused by changes in the status of ground installations.

   m) Monitoring of automatic flight control systems and autoland status annunciators with emphasis on the action to be taken in the event of failures of such systems.

   n) Actions to be taken in the event of failures such as engines, electrical systems, hydraulics of flight control systems.

   o) The effect of known unserviceabilities and use of minimum equipment lists.

   p) operating limitations resulting from airworthiness certification.

   q) Guidance on the visual cues required at DH together with information on maximum deviation allowed from glidepath or localizer.

   r) The importance and significance of AH, if applicable.

2. These items should be incorporated into the training program in sufficient detail to show how each one will be accomplished during initial and recurrent training. For instance, the simulator could be

frozen at/or below 50ft with varying visibility, wind components, runway lighting, configurations, and offsets from centerline to demonstrate conditions that may be encountered on the line. The above listed items should be accomplished in an approved simulator unless the applicant can show that equivalent training is provided by the use of other training aids and/or devices

3. The training program must train each flight crewmember to carry out his duties and the co-ordination with either crewmember.

4. Incapacitation procedures appropriate to CAT II and III operations shall be practiced.

5. For aircraft with no type specific simulator, operators must ensure that the initial flight-training phase specific to the visual scenarios of CAT II operations is conducted in a simulator approved for that purpose by the authority. The training and procedures that are type specific shall be practiced in the aircraft.

6. The training must be divided into phases covering normal operation with no aircraft or equipment failures, but including all weather conditions which may be encountered and detailed scenarios of aircraft and equipment failure which could affect CAT II or III operations. If the aircraft system involves the use of hybrid or other special systems (such as HUD or enhanced vision equipment) then flight crewmembers must practice the use of these systems in normal and abnormal modes during the simulator phase of training.

7. The initial CAT II and III training phase shall include at least the following exercises:

   a) Approach using the appropriate flight guidance, autopilot and control systems installed in the aircraft, to the appropriate DH and to include transition to visual flight and landing.

   b) Approach with all engines operating using the appropriate flight guidance system, autopilot and control systems installed in the aircraft down to the appropriate DH followed by missed approach; all without external visual reference.

   c) Where appropriate, approaches utilizing automatic flight systems to provide automatic flare, landing and roll-out.

   d) Normal operation of the applicable system both with and without acquisition of visual cues at DH.

8. Subsequent phases of initial training include at least:

   a) Approaches with engine failure at various stage on the approach.

   b) Approaches with critical equipment failures (e.g electrical systems, autoflight systems; ground and/or airborne ILS systems and status monitors).

   c) Approaches where failures of autoflight equipment at low level require either:

      - Reversion to manual flight to control flare, landing and roll-out or missed approach or

      - Reversion to manual flight or a downgraded automatic mode to control missed approaches from, at or below DH including those which, may result in a touchdown on the runway.

   d) Failures of the systems which will result in excessive localizer and/or glideslope deviation, both above and below DH, in the minimum visual conditions authorized for the operation. In

addition, a continuation to a manual landing must be practiced if a HUD forms a downgraded mode of the automatic system or the HUD display forms the only flare mode.

e) Failures and procedures specific to aircraft group, type or variant.

f) The training program must provide practice in handling faults, which require a reversion to higher minima.

g) The training program is to include the handling of the aircraft when, during a fail-passive CAT III approach, the fault causes the autopilot to disconnect at or below DH when the last reported RVR is 300m or less.

9. Transition training requirements to conduct CAT II and III operations:

a) Ground training: an operator must ensure that the requirements prescribed above are complied with

b) Simulator training.

- An operator must use an approved simulator specific to the aircraft type to conduct a minimum of eight approaches and/or landings. However, for initial CAT II training only, and where no simulator is available, a minimum of four approaches must be conducted in a simulator approved for the purpose. Aircraft training will then be required with a minimum of three approaches including at least one go-around.

- An operator must ensure that if any special equipment is required (e.g., HUD, EVS), appropriate additional training must be conducted.

10. Line flying under supervision.

a) Where CAT II manual landings are required, a minimum of three such landings from autopilot disconnect must be carried out.

b) For CAT III, a minimum of three autolands must be carried out, except that only one autoland is required when the training required in simulator training has been carried out in a full flight simulator usable for zero flight time training

ANNEX C - OPERATIONAL DEMONSTRATION FOR CAT II AND III

1. An operator must prove that he can perform CAT II or CAT III operations with the appropriate success rate and level of safety.

2. For this purpose, he must carry out an operational demonstration proving program to demonstrate that, in line service, the performance and the reliability of the aircraft and its systems meet the airworthiness certification criteria. Particular attention will also be given to the flight procedures as established by the operator and to the way the operator uses pilots' reports and applies his maintenance procedures.

3. The AAC will take into account flight reports or automatic recordings and the resulting approach and landing success rates.

4. An approach is considered to be successful if:

   a) from 500ft to start of flare:

      (1) speed is maintained within ±5kt disregarding rapid fluctuations due to turbulence and

      (2) no relevant system failure occurs.

   b) from 300ft to DH:

      (1) no excessive deviation occurs and

      (2) no warning gives a go-around order.

5. An automatic landing is considered to be successful if:

   a) no system failure occur;

   b) no flare failure occurs;

   c) no decrab failure occurs;

   d) main wheel touchdown occurs between 150m and 750m from runway threshold, assuming a normal GS antenna location;

   e) nose wheel touchdown occurs within 8m of runway centerline;

   f) touchdown vertical speed does not exceed 360ft/min;

   g) bank angle at touchdown does not exceed 7 degrees;

   h) pitch angle does not exceed to maximum value for a safe tail clearance;

   i) roll-out lateral deviation does not exceed 8m and

   j) no roll-out failure occurs.

6. Generally, unsuccessful approaches due to particular ATC factors, ground facility difficulties, or some other specific reasons may be excluded from the data after analysis if sufficient proofs are provided, for example:

a) the flight is vectored too close in for adequate localizer and glide slope capture;

b) lack of protection of ILS critical areas;

c) ATC request to abandon the approach;

d) ILS beam irregularities caused by other aircraft taxiing or overflying the antenna; etc

7. The operator must provide crew flight reports or automatic flight recordings during all the operational demonstration.

8. Automatic flight recordings must be provided in addition to crew reports for operations with DH below 50ft (15m).

9. The sources of data gathered during the operational demonstration should be distributed as evenly as possible across the fleet of the operator, using different airfield and ILS installations as required by the authority.

10. Crew reporting must provide the data bellow:

a) airfield and runway used;

b) weather conditions;

c) time;

d) adequacy of speed control;

e) any out-of-trim condition at time of automatic flight control system disengagement;

f) compatibility of automatic flight control systems, flight director and raw data;

g) indication of the position of the aircraft relative to the ILS center line when descending through 100ft (30m);

h) touchdown position;

i) reason for failure leading to aborted approach.

11. Automatic flight recordings must provide the data bellow:

a) deviation from localizer at touchdown;

b) flare time;

c) date of descent at touchdown;

d) pitch and bank angles at touchdown;

e) speed loss in flare;

f) maximum deviation during ground roll-out (for aircraft with automatic ground roll control or guidance).

12. A complete demonstration is required when an operator introduces a new aircraft into service for CAT II or CAT III. It consists of a progressive introduction to lower minima with periodic reports of the approaches made during actual in-line service.

13. At aerodromes where the terrain beneath the approach flight path is not level, automatic flight system behavior may result inadequate requiring a demonstration to determine that the performance or function of the automatic flight control system is not adversely affected. The automatic system performance must be confirmed in CAT I or better weather conditions prior to starting CAT II, CAT III or autoland operations.

14. For CAT II operations, the aircraft type must be operated for a period of at least 6 months with DH of 200ft or more, and RVR not less than 450 m, using the operating and maintenance procedures which are intended to be used when the minima is lowered. At least 30 approaches are required.

15. For CAT III operations, the aircraft type must be operated for a period of at least 6 months with CAT II minima, using the operating and maintenance procedures, which are intended to be used when the DH is lowered. At least 100 approaches are required.

16. If the number of unsuccessful operations 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 %.

17. The operator must have conducted authorized CAT II minima operations during 6 months before start CAT III operational demonstrations.

18. The operational demonstration as described above is not fully required in the cases the operator has previous experience in CAT ll or III operations with a variant of the same type of aircraft utilizing the same basic flight control and display systems.

19. For continuous monitoring, operators already authorized for CAT II or CAT III operations must continue to provide reports of in-line service, which must include the following information:
    a) The total number of approaches, by aircraft type, where the airborne CAT II or III equipment was utilized to make satisfactory (actual or practice) approaches to the applicable CAT II or III minima.
    b) The total number of unsatisfactory approaches by airfield and aircraft registration in the following categories:

        (1) airborne equipment faults;

        (2) ground facility difficulties;

        (3) missed approaches because of ATC instructions;

        (4) other reasons.

20. This continuous monitoring should permit the detection of any decrease in the level of safety before it becomes hazardous. The operator must continue to check his results and to take adequate actions by modifying the operating or maintenance procedures if necessary. The monitoring may also permit problems to be detected on a specified airfield (ILS, ATC procedures, etc.). The data must be retained for a period of 12 months .

ANNEX D – APPLICATION FORM FS.DSV.46

AAC AGÊNCIA DE AVIAÇÃO CIVIL	**APPLICATION FOR APPROVAL OF CAT II or CAT III OPERATIONS**	Reference:	FS.DSV.46
		Revision:	Original
		Date:	24-09-2015

Applicability: CAT I, III Operations in accordance with Instruction Nº24/DSV/2015, CV-CAR Part 7 and 8

Completion of form: Please complete those fields that are relevant to your aircraft and operations.

Each relevant box should be completed with a tick (v) or a (x). Items marked with an asterisk (*) to be completed only for first aircraft of each aircraft type / model in operator's fleet. Where form must be completed by referring to a document of applicant's documentation of system, add manual reference chapter and sub-chapter. Please ensure all applicable areas are completed.

Application Accuracy of information provided. All information will be used to assess CAT I or CAT III compliance. An incomplete, poorly prepared or inaccurate application may:
- Result in rejection of the application
- Result in delays
- Add to the cost of the assessment
- Result in a refusal to issue the approval

Note: It is an offence to make a false declaration in this form.

Applications for CAT II or CAT III approval shall be made using AAC Form FS.DSV.46. Submit the form and application package required by Instruction Nº24DSV2015 to:

AGÊNCIA DE AVIAÇÃO CIVIL (AAC)
Av. Cidade de Lisboa, Nº 34 – Várzea
C.P. 371 – Praia, Cabo Verde

1. GENERAL		
General Information		
1. Applicant:		
2. Contact person for : Airworthiness related items: Operations related items:	Phone: Phone:	Email: Email:
3. Aircraft Registration:		
4. Aircraft Manufacturer:		
5. Aircraft Type Designation / Model Designation:		
6. Serial No.:		
Scope of Application		
7. Approval for : ☐ CAT II ☐ CAT IIIA ☐ CAT IIIB		
8. Initial request for AWO approval for aeroplane type referenced in 1.5? ☐ Yes ☐ No		

2. AIRWORTHINESS
Type Design Approval for referenced Aircraft Type Designation
1. The Aircraft type design approval is reflected in: ☐ AFM ☐ AFM Supplements ☐ Type Certification Data Sheet ☐ Supplemental Type Certificate ☐ other:
2. Aeroplane Flight Manual (Supplement) shows following airworthiness approval for AWO systems installation: ☐ CAT II ☐ CAT IIIA ☐ CAT IIIB
System Eligibility for referenced Aircraft Serial Number
3. System manufacturer / model installed (e.g. Flight Guidance System (FGS)): Make: Model: TSO- Make: Model: TSO- Make: Model: TSO-
4. The AWO type design approval is reflected in: □ Type design □ FAA STC □ STC □ Service Bulletin □ JAA STC □ Major Modification □ other:

Maintenance Program (*)	Yes	No
5. The applicant should have an established Maintenance Program that contains all AWO related maintenance requirements prescribed by manufactured or design organization. AWO Maintenance program established?	☐	☐
Minimum Equipment List (*)		
6. The applicant should revised parts of Minimum Equipment List (MEL) to reflect system requirements (e.g. redundancy levels) appropriate to the intended RVSM operations? Minimum Equipment List revised?	☐	☐

Maintenance Practices and Procedures (*)	
The applicant must institute procedures in respect of continuing airworthiness practices for AWO. These procedures should cover the following subjects:	*To be completed by applicant* RVSM Maintenance Practices and Procedures are described in (Add manual reference, chapter and sub-chapter)
7. Maintenance of AWO equipment (adherence to manufacturer's maintenance instructions, modification procedures, procedures, repair procedures, system calibration policy, AWO maintenance practices, handling of on-board systems, etc.).	
8. Action for non-compliant aeroplane (downgrading, technical log entries, corrective actions, placarding, upgrading, release to service procedures, monitoring and reporting of repetitive defects, reliability reporting, reporting to the AAC, etc.).	
9. Maintenance Training (training of applicant's maintenance management staff, training of contractor's maintenance personnel, initial training, recurrent training, training syllabi, etc, as applicable.)	
10. Test Equipment (use of test equipment, handling, calibration, etc.)	

3. OPERATION

Operating Practices and Procedures (*)	
The applicant must institute AWO Operating Practices and Procedures. These practices and procedures should cover the following subjects:	*To be completed by applicant* RVSM Operating Practices and Procedures are described in (add manual reference, chapter and sub-chapter):
1. Flight planning procedures Flight planning procedures (AWO status of aeroplane, review of technical log, use of minimum equipment list (MEL), external inspection (navigation antennas), etc.)	
2. Requirements and normal procedures for Cat II/III approach (flight profiles, crew co-ordination,	
3. Requirements and procedures for low visibility take-off.	
4. Requirements and procedures on the ground	
5. Procedures with respect to flight crew response to abnormal situations (response to non-normal events, etc.).	
6. Post-flight procedures (technical log entries, defects description, etc.).	
7. Continuous monitoring of low visibility operations.	

Flight Crew Training and Qualification (*)	
The applicant is required to establish the following (covering subjects under 3.1 to 3.7):	*To be completed by applicant* Description in (add manual reference, chapter and subchapter):
8. Flight crew qualification requirements.	
9. Description of initial and recurrent training, checking-and training-syllabi.	

4. APPLICATION PACKAGE

Documentation to be submitted to the AAC	Submitted?	
	Yes	No
1. Compliance Statement which shows how the criteria of CV-CAR Part 7 and CA-CAR Part 8 have been satisfied (*)	☐	☐

2. Sections of the AFM or AFM Supplements that document AWO airworthiness approval	☐	☐
3. Flight crew AWO training programmes and syllabi for initial and recurrent training (*)	☐	☐
4. Operation Manuals and Checklists that include AWO operating practices and procedures (OM-A, OMB, OM-D, AOM,FCOM, Route Manuals, stand-alone AWO manual, etc.) (*)	☐	☐
5. Minimum Equipment List (MEL) that include items pertinent to AWO operations (*)	☐	☐
6. Operational demonstration plan	☐	☐
7. Maintenance Program or revision thereof that include item pertinent to AWO equipment (*)	☐	☐
8. AWO maintenance practices & procedures (MME, Maintenance Program, Stand-alone equipment) (*)	☐	☐
9. Maintenance Personnel training programmes and syllabi for initial and recurrent training (*)	☐	☐
10. Service Bulletin, Supplemental Type Certificate (STC) or Major Modification Approval Documentation, if approval based on documents as detailed in 2.4 above (except if based on approved type design).	☐	☐

5. APPLICANT'S STATEMENT

The undersigned certifies the above information to be correct and true and that aeroplane system installation, continuing airworthiness of systems, minimum equipment for dispatch, operating procedures and flight crew training comply with the CV-CAR requirements and the Instruction Nº24/DSV/2015.

Name of Post Holder Maintenance:	**Signature:**	**Date:**
Name of Post Holder Operations:	**Signature:**	**Date:**
Name of Post Holder Training:	**Signature:**	**Date:**

FOR OFFICIAL USE ONLY

Subject	Responsibl	Date	SRS Nº	Signature
1. AAC Form FS.DSV.46 and package checked for completeness.	Certification team			
2. Airworthiness Approval granted	AWI			
3. Operational Approval granted (AOC, Operations Specification and Letter of Authorisation).	FOI			
4. AWO approval process administratively completed (OPS Update, Billing, and Exchange of Certificates).	Certification team			

Withdrawal of AWO Approval:

Reason:

Name: *Date:* *Signature:*