Aviation Safety Rules & Regulations

ANTR OPS 3

In compliance with ICAO Annex 6 Part III 8th Edition July 2016 :
Amendments 20-A, 20-B and 21
Consequential Amendments to ANTR OPS Part 3:
Head-Up Display (HUD) and Equivalent Visual System (EVS)
Amendment ANTR OPS 3 Subpart E Section 1 & 2

To comply with ICAO Annex 6 Part III – Amendment 20-A

SUBPART K – INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

SUBPART L – COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

With regard to the above amended chapter headings, all subsequent headings and index to be amended.

All instances of "an operator" to be amended to "the operator".

All instance of "~~the BCAA~~" "the Aurhority" to be amended to "~~the BCAA~~" "the BCAA".

1.

Annex 6 Part III, 1.1.1

ANTR OPS 3.020 Laws, Regulations and Procedures - Operator's Responsibilities

(a) ~~An~~ The operator shall ensure that:

(1) All employees, when abroad, ~~are made aware~~ know that they shall comply with the laws, regulations and procedures of those States in which operations are; and

(2) All ~~crew members~~ pilots are familiar with the laws, regulations and procedures pertinent to the performance of their duties, prescribed for the areas to be traversed, the aerodromes/heliports to be used and the air navigation facilities relating thereto.

(3) ~~The operator shall ensure that~~ Other members of the flight crew are familiar with such of these laws, regulations and procedures as are pertinent to the performance of their respective duties in the operation of the helicopter.

2.

Annex 6 Part III, 1.1.8

ANTR OPS 3.025 Common Language

(a) ~~An~~ The operator ~~shall~~ shall ensure that ~~all~~ flight crew members ~~can communicate in a common language~~ demonstrate the ability to speak and understand the language used for radiotelephony communications as specified in ANTR-FCL 2.

(b) ~~An~~ The operator ~~shall~~ shall ensure that all operations personnel are able to understand the language in which those parts of the Operations Manual which pertain to their duties and responsibilities are written.

(c) Helicopter pilots who are required to use the radio telephone aboard a helicopter shall demonstrate the ability to speak and understand the English language as per ANTR FCL-2.

3.

Annex Part III, 2.2.1.5

Appendix 1 to ANTR OPS 3.175 Contents and conditions of the Air Operator Certificate

1. The air operator certificate shall follow the layout of ICAO Annex 6, Part III, Appendix 3, paragraph 2 and shall contain at least the following information;

   (a) The State of the Operator and the issuing Authority (the BCAA);

   (b) The air operator certificate number and its expiration date;

   (c) The operator name, trading name (if different) address of the (principal place of business;

   (d) Date of issue and name, signature and title of the BCAA representative; and

   (e) the location, in a controlled document carried on board, where the contact details of operational management can be found.

2. The operations specifications associated with the air operator certificate shall follow the layout of ICAO Annex 6, Part III, Appendix 3, paragraph 3 and shall contain at least the information for each aircraft model in the operator‘s fleet, identified by aircraft make, model and series, the following list of authorisations, conditions and limitations shall be included:

……

4.

Annex Part III, 2.2.3.1

ANTR OPS 3.200 Operations Manual

~~An~~ The operator shall provide an Operations Manual in accordance with ANTR OPS Part 3, Subpart P for the use and guidance of operations personnel.

ANTR OPS 3.1040 General Rules for Operations Manuals

All instances of “An operator” are amended to “The operator” as above in ANTR OPS 3.200.

…….

(i) ~~An~~ The operator shall supply the BCAA with intended amendments and revisions in advance of the effective date. When the amendment concerns any part of the Operations Manual which shall be approved in accordance with ANTR OPS ~~Part~~ 3, this approval shall be obtained before the amendment becomes effective. When immediate amendments or revisions are required in the interest of safety, they may be published and applied immediately, provided that any approval required has been applied for.

5.

Annex Part III, 2.2.11.3

ANTR OPS 3.285 Passenger briefing

~~An~~ The operator shall ensure that:

……..

6.

Annex Part III, 2.3.4

ANTR OPS 3.295 Selection of Heliports or Landing Locations

(a) ~~An~~ The operator shall establish procedures for the selection of destination and/or alternate heliports or landing locations in accordance with ANTR OPS 3.220 when planning a flight.

(b) The commander shall select a take-off alternate heliport within one hour flight time at normal cruise speed for a flight under instrument meteorological conditions if it would not be possible to return to the heliport or landing location of departure due to meteorological reasons.

(c) A flight to be conducted in accordance with IFR shall not be commenced unless information is available which indicates that conditions at the destination heliport or landing location or, when an alternate is required, at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

(d) On a VFR flight a commander shall not commence take-off unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to enable compliance with these regulations.

(e) In addition to (c) or (d) above, for a flight to be conducted in accordance with the Instrument Flight Rules or when flying VFR and navigating by means other than by reference to visual landmarks, the commander shall specify at least one alternate heliport in the operational flight plan unless:

(1) The destination is a coastal heliport or landing location (See AMC OPS 3.295(c)(1) and IEM OPS 3.295(c)(1)); or

(2) For a flight to any other land destination, the duration of the flight and the meteorological conditions prevailing are such that, at the estimated time of arrival at the heliport or landing location of intended landing, an approach and landing may be made under visual meteorological conditions as prescribed by the BCAA; or

(3) The heliport or landing location of intended landing is isolated and no alternate is available. A Point of No Return (PNR) shall be determined.

(f) ~~An~~ The operator shall select two destination alternatives when:

(1) The appropriate weather reports or forecasts for the destination, or any combination thereof, indicate that during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival the weather conditions will be below the applicable planning minima; or

(2) no meteorological information is available for the destination.

(g) Off-shore alternate heliports may be specified subject to the following (see AMC OPS 3.295(e) and IEM OPS 3.295(e)):

(1) An off-shore alternate heliport shall be used only after a Point of No Return (PNR). Prior to PNR, on-shore alternate heliports shall be used.

(2) Mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternate heliport(s).

(3) One engine inoperative landing capability shall be attainable at the alternate heliport.

(4) Deck availability shall be guaranteed. The dimensions, configuration and obstacle clearance of individual helidecks or other sites shall be assessed in order to establish operational suitability for use as an alternate by each helicopter type proposed to be used.

(5) Weather minima shall be established taking accuracy and reliability of meteorological information into account (see IEM OPS 3.295(e)(4)).

(6) The Minimum Equipment List shall reflect essential requirements for this type of operation.

(7) Unless specifically approved by the BCAA, offshore alternate heliports shall not be used when it is possible to carry enough fuel to have an onshore alternate.

(8) Offshore alternate heliports shall not be used in a hostile environment.

(9) An off-shore alternate heliport shall not be selected unless the operator has published a procedure in the Operations Manual approved by the BCAA.

(h) ~~An~~ The operator shall specify any required alternate(s) in the operational flight plan.

(i) To ensure that an adequate margin of safety is observed in determining whether or not an approach and landing can be safely carried out at each alternate heliport or landing location, the operator shall specify appropriate incremental values for height of cloud base and visibility, acceptable to the BCAA, to be added to the operator's established heliport or landing location operating minima.

7.

Annex Part III, 2.3.5

ANTR OPS 3.340 Meteorological Conditions

~~(a) On an IFR flight a commander shall not:~~

~~(1) Commence take-off; nor~~

~~(2) Continue beyond the point from which a revised flight plan applies in the event of in-flight replanning, unless information is available indicating that the expected weather conditions at the destination and/or required alternate heliport(s) or landing location(s) prescribed in ANTR OPS 3.295 are at or above the planning minima, prescribed in ANTR OPS 3.297~~.

~~(b) On a VFR flight a commander shall not commence take-off unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to render compliance with these rules possible.~~

~~(c) On an IFR flight, a commander shall not continue towards the planned destination heliport or landing location unless the latest information available indicates that, at the expected time of arrival, the weather conditions at the destination, or at least one destination alternate heliport or landing location, if required, are at or above the applicable heliport or landing location operating minima, prescribed in sub-paragraph (a) above~~.

(a) A flight shall not be continued towards the heliport of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be affected at that heliport, or

at least one destination alternate heliport, in compliance with VFR or the operating minima established in accordance with OPS 3.297.

(b) A flight to a helideck or elevated heliport or landing location shall not be operated when the mean wind speed at the helideck or elevated heliport is reported as 60 knots or more.

8.

Annex Part III, 2.3.6.1

ANTR OPS 3.255 Fuel and Oil Requirements / policy

(See AMC OPS 3.255)

~~(a) An operator shall establish a fuel policy for the purpose of flight planning and in-flight re-planning to ensure that every flight carries sufficient fuel for the planned operation and reserves to cover deviations from the planned operation.~~

(a) A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight. In addition, a reserve shall be carried to provide for contingencies. In computing the fuel and oil required, at least the following shall be considered:

(1) meteorological conditions forecast;

(2) expected air traffic control routings and traffic delays;

(3) for IFR flight, one instrument approach at the destination heliport, including a missed approach;

(4) the procedures prescribed in the operations manual for loss of pressurization, where applicable, or failure of one engine while en route; and

(5) any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

(b) VFR Operations

The fuel and oil carried in order to comply with (a) shall, in the case of VFR operations, be at least the amount to allow the helicopter to:

(1) fly to the landing site to which the flight is planned;

(2) have final reserve fuel to fly thereafter for a period of 20 minutes at best-range speed; and

(3) have an additional amount of fuel, to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the BCAA. (See AMC OPS 3.255)

(c) IFR Operations

The fuel and oil carried in order to comply with (a) shall, in the case of IFR operations, be at least the amount to allow the helicopter:

(1) When an alternate is not required, to fly to and execute an approach at the heliport or landing location to which the flight is planned, and thereafter to have:

(i) final reserve fuel to fly 30 minutes at holding speed at 450 m (1 500 ft) above the destination heliport or landing location under standard temperature conditions and approach and land; and

(ii) an additional amount of fuel, to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the BCAA. (See AMC OPS 3.255)

(2) When an alternate is required, to fly to and execute an approach, and a missed approach, at the heliport or landing location to which the flight is planned, and thereafter:

(i) to fly to and execute an approach at the alternate specified in the flight plan; and then

(ii) have final reserve fuel to fly for 30 minutes at holding speed at 450 m (1 500 ft) above the alternate under standard temperature conditions, and approach and land; and

(iii) to have an additional amount of fuel, to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the BCAA. (See AMC OPS 3.255)

(3) When no alternate heliport or landing location is available (e.g. the destination is isolated), sufficient fuel shall be carried to enable the helicopter to fly to the destination to which the flight is planned and thereafter for a period acceptable to the BCAA that will, based on geographic and environmental considerations, enable a safe landing to be made.

(d) ~~An~~ The operator shall ensure that the planning of flights is only based upon:

(1) Procedures and data contained in or derived from the Operations Manual or current helicopter specific data; and

(2) The operating conditions under which the flight is to be conducted including:

(i) Realistic helicopter fuel consumption data;

(ii) Anticipated masses;

(iii) Expected meteorological conditions; and

(iv) Air Traffic Services procedures and restrictions.

(e) ~~An~~ The operator shall ensure that the pre-flight calculation of usable fuel required for a flight includes: (see IEM OPS 3.255)

(1) Taxi fuel;

(2) Trip fuel;

(3) Reserve fuel consisting of:

(i) Contingency fuel (see IEM OPS 3.255(c)(3)(i));

(ii) Alternate fuel, if a destination alternate heliport is required (This does not preclude selection of the departure heliport or landing location as the destination alternate.);

(iii) Final reserve fuel; and

(iv) Additional fuel, if required by the type of operation (e.g. isolated heliports or landing location); and

(4) Extra fuel if required by the commander.

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

(g) ~~An~~ The operator shall ensure that in-flight replanning procedures for calculating usable fuel required when a flight has to proceed along a route or to a destination other than originally planned include:

(1) Trip fuel for the remainder of the flight;

(2) Reserve fuel consisting of:

(i) Contingency fuel;

(ii) Alternate fuel, if a destination alternate heliport is required. (This does not preclude selection of the departure heliport or landing location as the destination alternate.);

(iii) Final reserve fuel; and

(iv) Additional fuel, if required by the type of operation (e.g. isolated heliports or landing locations); and

(3) Extra fuel if required by the commander.

(h) The operator shall maintain fuel and oil records to enable the BCAA to ascertain that, for each flight, the above requirements have been complied with.

9.

Annex Part III, 4.3.1.2

ANTR OPS 3.705 Flight Data Recorders and Aircraft Data Recording Systems

(See Appendix 1 to ANTR OPS 3.705)

……

(b) Applicability

(1) All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2016 shall be equipped with a Type IVA FDR.

(2) All helicopters of a maximum certified take-off mass over 7 000 kg, or having a passenger seating configuration of more than nineteen, for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with Type IV FDR.

(3) All helicopters of a maximum certificated take-off mass over 3 175 kg, up to and including 7 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January shall be equipped with a Type V FDR.

(4) All turbine-engined helicopters of a maximum certificated take-off mass of over 2 250 kg, up to and including 3 175 kg for which the application for type certification was submitted to a Contracting State on or after 1 January 2018 shall be equipped with:

(a) a Type IV A FDR; or

(b) a Class C AIR capable of recording flight path and speed parameters displayed to the pilot(s); or

(c) an ADRS capable of recording the essential parameters defined in Table 2 of Appendix 1 to ANTR OPS 3.705.

Note 1: "The application for type certification is submitted to a Contracting State" refers to the date of application for the original "Type Certificate" for the helicopter type and not the date of certification of particular helicopter variants or derivative models.

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(c) Discontinuation

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(4) The use of magnetic tape FDRs. ~~shall be discontinued by 1 January2016~~.

10.

Annex Part III, 4.3.2.1.2

ANTR OPS 3.710 Cockpit Voice Recorder and Cockpit Audio Recording Systems

~~(a) An operator shall not operate a helicopter first issued with an individual Certificate of Airworthiness, on or after 1 August 1999, which has a maximum certificated take-off mass (MCTOM) over 3 175 kg unless it is equipped with a cockpit voice recorder which, with reference to a time scale, records~~:

~~(1) Voice communications transmitted from or received by the crew by radio;~~

~~(2) The aural environment of the cockpit including, without interruption, the audio signals received from each crew microphone in use;~~

~~(3) Voice communications of crew members using the crew members interphone system;~~

~~(4) Voice or audio signals identifying navigation or approach aids introduced into a headset or speaker; and~~

~~(5) Voice communications of crew members using the public address system, where practicable~~.

(a) All helicopters of a maximum certificated take-off mass of over 7 000 kg for which the individual certificate of airworthiness was first issued before 1 January 1987 shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

(b) All helicopters of a maximum certificated take-off mass of over 7 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

(c) All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 should be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed should be recorded on the CVR.

Note 1: CVR performance requirements are as contained in the EUROCAE ED-112, Minimum Operational Performance Specification (MOPS) for Crash Protected Airborne Recorder Systems, or equivalent documents.

Note 2: CARS performance requirements are as contained in the EUROCAE ED-155, Minimum Operational Performance Specification (MOPS) for Lightweight Flight Recorder Systems, or equivalent documents.

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11.

Annex Part III, 4.4.3

ANTR OPS 3.650 Day VFR operations – Flight and navigational instruments and associated equipment

(See AMC OPS 3.650/3.652)
(See IEM OPS 3.650/3.652)

The operator shall not operate a helicopter by day in accordance with Visual Flight Rules (VFR) unless it is equipped with the flight and navigational instruments and associated equipment and, where applicable, under the conditions stated in the following sub-paragraphs:

……

(g) A means of indicating ~~in the flight crew compartment~~ on the flight deck the outside air temperature calibrated in degrees Celsius (see AMC OPS 3.650(g) & 3.652(k).)

12.

Annex Part III, 4.4.3

ANTR OPS 3.652 IFR or night operations – Flight and navigational instruments and associated equipment

(See AMC OPS 3.650/3.652) (See IEM OPS 3.650/3.652)

The operator shall not operate a helicopter in accordance with Instrument Flight Rules (IFR) or by night in accordance with Visual Flight Rules (VFR) unless it is equipped with the flight and navigational instruments and associated equipment and, where applicable, under the conditions stated in the following sub-paragraphs:

……

(k) A means of indicating ~~in the flight crew compartment~~ on the flight deck the outside air temperature calibrated in degrees Celsius (see AMC OPS 3.650(g) & 3.652(k)); and

13. Annex Part III, 4.5.2.1

ANTR OPS 3.830 Life-rafts and survival ELTs on extended overwater flights

(a) The operator shall not operate a helicopter on a flight over water at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed when operating in Performance Class 1 or 2, or 3 minutes flying time at normal cruising speed when operating in Performance Class 3 unless it carries:

……

(2) In the case of a helicopter carrying more than 11 persons, a minimum of two life-rafts sufficient together to accommodate all persons capable of being carried on board. ~~Should one life-raft of the largest rated capacity be lost, the overload capacity of the remaining life-raft(s) shall be sufficient to accommodate all persons on the helicopter~~ Each life raft shall be able to carry all occupants in the overload state (See AMC OPS 3.830(a)(2));

Note: The life raft overload state has a design safety margin of 1.5 times the maximum capacity.

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14.

Annex Part III, 4.8.3

ANTR OPS 3.770 Supplemental Oxygen for Pressurised Helicopters complies with Annex 6 Part III, paragraph 4.8.3.

15.

SUBPART L — COMMUNICATION ~~AND~~, NAVIGATION AND SURVEILLANCE EQUIPMENT

16.

Annex Part III, 5.1.3

ANTR OPS 3.850 ~~Radio~~ Communication Equipment

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(d) For ~~flights in defined portions of airspace or on routes where an RCP type has been prescribed~~ operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), a helicopter shall, in addition to the requirements specified in this Subpart:

(1) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP ~~type~~ specification(s); and

(2) ~~be authorised by the BCAA for operations in such airspace~~ have information relevant to the helicopter RCP specification capabilities listed in the helicopter flight manual or other helicopter documentation approved by the State of Design or the BCAA, as the State of Registry, and

(3) have information relevant to the helicopter RCP specification capabilities included in the MEL.

(e) The BCAA shall, for operations where an RCP specification for PBC has been prescribed, ensure that the operator has established and documented:

(1) normal and abnormal procedures, including contingency procedures;

(2) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;

(3) a training programme for relevant personnel consistent with the intended operations; and

(4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

(f) The BCAA shall ensure that, in respect of those helicopters mentioned in sub-paragraph (d) above, adequate provisions exist for:

(1) receiving the reports of observed communication performance issued by monitoring programmes; and

(2) taking immediate corrective action for individual helicopters, helicopter types or operators, identified in such reports as not complying with the RCP specification.

17.

Annex Part III, 5.2.2

ANTR OPS 3.865 Communication and Navigation equipment for operations under IFR, or under VFR over routes not navigated by reference to visual landmarks

……

(c) *Navigation equipment*. ~~An~~ The operator shall ensure that the navigation equipment will enable it to proceed in accordance with its flight plan; and in accordance with the requirements of air traffic services; and

(1) Comprises not less than:

……

(2) For operations where a navigation specification for performance-based navigation (PBN) has been prescribed, a helicopter shall, in addition to requirements specified in this Subpart;

(i) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s); and

(ii) ~~be authorised by the BCAA for such operations~~ have information relevant to the helicopter navigation specification capabilities listed in the helicopter flight manual or other helicopter documentation approved by the State of Design or the BCAA as the State of Registry, and

(iii) have information relevant to the helicopter navigation specification capabilities

included in the MEL (See also AC OPS 1.243).

(3) On flights in which it is intended to land in instrument meteorological conditions, a helicopter shall be provided with appropriate navigation equipment providing guidance to a point from which a visual landing can be effected. This equipment shall be capable of providing such guidance at each heliport at which it is intended to land in instrument meteorological conditions and at any designated alternate heliports.

(d) The BCAA shall, for operations where a navigation specification for PBN has been prescribed, ensure that the operator has established and documented:

(1) normal and abnormal procedures, including contingency procedures;

(2) flight crew qualification and proficiency requirements, in accordance with appropriate navigation specifications;

(3) a training programme for relevant personnel consistent with the intended operations; and

(4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate navigation specifications.

(e) The BCAA shall issue a specific approval for operations based on PBN authorisation required (AR) navigation specifications.

……

18.

Annex Part III, 5.3.1

ANTR OPS 3.867 Surveillance Equipment

(a) A helicopter shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.

(b) For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance (PBS), a helicopter shall, in addition to the requirements specified in sub-paragraph (a);

(1) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);

(2) have information relevant to the helicopter RSP specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or the BCAA; and

(3) have information relevant to the helicopter RSP specification capabilities included in the MEL.

(c) The BCAA shall, for operations where an RSP specification for PBS has been prescribed, ensure that the operator has established and documented;

(1) normal and abnormal procedures, including contingency procedures;

(2) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;

(3) a training programme for relevant personnel consistent with the intended operations; and

(4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.

(d) The BCAA shall ensure that, in respect of those helicopters mentioned in sub-paragraph (b), adequate provisions exist for;

(1) receiving the reports of observed surveillance performance issued by monitoring programmes; and

(2) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RSP specification.

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19.

Annex Part III, 5.4

ANTR OPS 3.845 General introduction

(See IEM OPS 3.845)

(a) ~~An~~ The operator shall ensure that a flight does not commence unless the communication and navigation equipment required under this Subpart is:

……

(2) Installed such that the failure of any single unit required for ~~either~~ communication, ~~or~~ navigation or surveillance purposes, or ~~both~~ any combination thereof, will not result in the failure of another unit required for communication, ~~or~~ navigation or surveillance purposes.

……

20.

Annex Part III, 5.5

ANTR OPS 3.873 Electronic Navigation Data Management

(a) The operator shall not use a navigation database which supports an airborne navigation application as a primary means of navigation unless the navigation database supplier holds a Type 2 Letter of Acceptance (LoA) or equivalent.

(b) If the operator's supplier does not hold a Type 2 LoA or equivalent, the operator shall not use the electronic navigation data products unless the BCAA has approved the operator's procedures for ensuring that the process applied and the delivered products have met equivalent standards of integrity.

(c) The operator shall not use electronic navigation data products for other navigation applications unless the BCAA has approved the operator's procedures for ensuring that the process applied and the delivered products have met acceptable standards of integrity and that the products are compatible with the intended function of the equipment that will use them.

(d) The operator shall continue to monitor both the process and the products according to the requirements of OPS 3.035.

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

21.

Annex Part III, 7.3.1

ANTR OPS 3.941 Training - General

The operator shall establish and maintain a ground and flight training programme, approved by the BCAA in accordance with this Subpart, which ensures that all flight crew members are adequately trained to perform their assigned duties. The training programme shall:

(a) include ground and flight training facilities and properly qualified instructors as determined by the BCAA;

(b) consist of ground and flight training for the type(s) of helicopter on which the flight crew member serves;

(c) include proper flight crew coordination and training for all types of emergency and abnormal situations or procedures caused by engine, transmission, rotor, airframe or systems malfunctions, fire or other abnormalities;

(d) include training in knowledge and skills related to the visual and instrument flight procedures for the intended area of operation, human performance and threat and error management, the transport of dangerous goods and, where applicable, procedures specific to the environment in which the helicopter is to be operated;

(e) ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures;

(f) include training in knowledge and skills related to the operational use of head-up display and/or enhanced vision systems for those helicopters so equipped; and

(g) be given on a recurrent basis, as determined by the BCAA and shall include an assessment of competence.

(h) The requirement for recurrent flight training in a particular type of helicopter shall be considered fulfilled by:

(1) the use, to the extent deemed feasible by the BCAA, of flight simulation training devices approved by that State for that purpose; or

(2) the completion within the appropriate period of the proficiency check required by ANTR OPS 3.943, 3.945 and 3.965 in that type of helicopter.

22.

Annex Part III, 7.4.2.5

ANTR OPS 3.975 Route/Role/Area - Competence Qualification
(See AMC OPS 3.975)

(a) The operator shall ensure that, prior to being assigned as commander or as pilot to whom the conduct of flight may be delegated by the commander on a route, in a role or an area, the pilot has obtained adequate knowledge of the route to be flown and of the heliports or landing locations (including alternates), facilities and procedures to be used. Each such pilot shall demonstrate to the operator an adequate knowledge of:

(1) the operation to be flown. This shall include knowledge of:

(i) the terrain and minimum safe altitudes;

(ii) the seasonal meteorological conditions;

(iii) the meteorological, communication and air traffic facilities, services and procedures;

(iv) the search and rescue procedures; and

(v) the navigation facilities and procedures associated with the route or area in which the flight is to take place; and

(2) procedures applicable to flight paths over heavily populated areas and areas of high air traffic density, obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, and applicable operating minima.

(b) A pilot-in-command shall have made a flight, representative of the operation with which the pilot is to be engaged which shall include a landing at a representative heliport, as a member of the flight crew and accompanied by a pilot who is qualified for the operation.

(c) The operator shall not continue to utilise a pilot as a pilot-in-command on an operation in an area specified by the operator and approved by the BCAA unless, within the preceding 12 months, the pilot has made at least one representative flight as a pilot member of the flight crew, or as a check pilot, or as an observer on the flight deck. In the event that more than 12 months elapse in which a pilot has not made such a representative flight, prior to again serving as a pilot-in-command on that operation, that pilot shall requalify in accordance with sub-paragraphs (a) and (b) above.

(d) The period of validity of the route/role/area competence qualification shall be 12 calendar months in addition to the remainder of:

(1) The month of qualification; or

(2) The month of the latest operation on the route, in the role or area.

(e) The route/role/area competence qualification shall be revalidated by operating on the route, in the role or area within the period of validity prescribed in sub-paragraph (a) (2) above.

(f) If revalidated within the final 2 calendar months of validity of previous route/role/area competence qualification, the period of validity shall extend from the date of revalidation until 12 calendar months from the expiry date of that previous route/role/area competence

23.

Annex Part III, 10.1

ANTR OPS 3.988 Applicability
(~~See Appendix 1 to ANTR OPS 3.988~~)

~~An~~ The operator shall ensure that all crew members, other than flight crew members, assigned by the operator to duties in the helicopter, comply with the requirements of this Subpart. ~~except for cabin crew members who will comply only with the requirements in Appendix 1 to ANTR OPS 3.988~~.

24.

Annex Part III, 10.1

ANTR OPS 3.990 ~~*Intentionally blank*~~ Assignment of Emergency Duties

The operator shall establish, to the satisfaction of the BCAA, the minimum number of cabin crew required for each type of helicopter, based on seating capacity or the number of passengers carried, which shall not be less than the minimum number established during certification, in order to effect a safe and expeditious evacuation of the helicopter, and the necessary functions to be performed in an emergency or a situation requiring emergency evacuation. The operator shall assign these functions for each type of helicopter.

25.

~~Appendix 1 to ANTR OPS 3.988 Cabin Crew members~~

~~(a) *Applicability*. An operator shall ensure that all cabin crew members, assigned by the operator to duties in the passenger compartment of a helicopter comply with the requirements of ANTR OPS 3 Subpart O, except for the variations contained in this appendix~~.

~~(b) *Interpretation of terms*. When applying the text of ANTR OPS 3 Subpart O, the following text shall be interpreted, for the purpose of this appendix, as indicated~~:

~~(1) In ANTR OPS 3.988, the use of the term crew members is not to be interpreted to mean crew members in the sense of ANTR OPS 3 Subpart O~~.

~~(2) For aeroplane read helicopter~~.

~~(3) The term airport(s) includes heliport(s) or landing location(s)~~.

~~(4) Reference to any other subpart of ANTR OPS 3 means the appropriate subpart of ANTR OPS 3~~.

~~(c) *Alleviation*. The following rules do not apply to helicopter cabin crew members~~:

~~(1) Appendix 1 to ANTR OPS 3.1010 Conversion and Differences trai~~ning:

~~(i) paragraph (d); evacuation slide training~~;

~~(ii) paragraph (e)(2)(ii); severe air turbulence~~;

~~(iii) paragraph (e)(2)(iii) sudden decompression~~;

~~(iv) paragraph (h)(1); slides~~;

~~(v) paragraph (h)(2); slide rafts~~;

~~(vi) paragraph (h)(4); dropout oxygen~~.

26.

Annex Part III, Appendix 3 Air Operator Certificate (AOC).

TPM GEN 01 AOC, paragraph 7.5.6, Operations Specifications, complies with Annex 6 Part III, Appendix 3 Air Operator Certificate (AOC).

27.

Annex Part III, 4.1

Appendix 2 to ANTR OPS 3.705 Flight Data Recorders and Aircraft Data Recording Systems

Airborne Image Recorder (AIR) and Airborne Image Recording System (AIRS) Classification:

(a) Classes

(1) A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1: To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.

Note 2: There are no provisions for Class A AIRs in this document.

(2) A Class B AIR or AIRS captures data link message displays.

(3) A Class C AIR or AIRS captures instruments and control panels.

Note: A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR, or where an FDR is not required.

28.

Annex Part III, 4.2

ANTR OPS 3.705 Flight Data Recorders and Aircraft Data Recording Systems (See Appendix 1 to ANTR OPS 3.705)

……

(e) Operations

(1) An FDR, AIR, AIRS or ADRS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power.

(2) In addition, depending on the availability of electrical power, the AIR or AIRS, if installed, shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

29.

Annex Part III, 4.16

ANTR OPS 3.785 Automatic Landing Systems, a Head Up Display (HUD) or Equivalent Displays, Enhanced Vision Systems (EVS), Synthetic Vision Systems (SVS) and/or Combined Vision Systems (CVS)

(See Appendix 1 to ANTR OPS 3.785 HUD, VS or Equivalent)

The operator shall not operate a helicopter equipped with automatic landing systems, a head-up display (HUD) or equivalent displays, enhanced vision systems (EVS), synthetic vision systems (SVS) and/or combined vision systems (CVS) unless:

(a) An approval has been issued by the BCAA for the operational use of such displays;

(b) The equipment meets the appropriate airworthiness certification requirements;

(c) The operator has carried out a safety risk assessment of the operations supported by the HUD or equivalent displays, EVS, SVS or CVS;

(d) The operator has established and documented the procedures for the use of, and training requirements for, a HUD or equivalent displays, EVS, SVS or CVS: and

(e) The criteria for the use of such systems for the safe operation of an helicopter as described in Appendix 1 to ANTR OPS 3.785 HUD, VS or Equivalent is complied with as applicable.

30.

Annex Part III, Attachment I

Appendix 1 to ANTR OPS 3.785 Automatic Landing Systems, Head-up Display (HUD), Equivalent Displays and Vision Systems (VS) ~~or Equivalent~~ (See ANTR OPS 3.785)

Introduction

The material in this ~~attachment~~ appendix provides guidance for certified automatic landing systems, HUD, equivalent displays and vision systems intended for operational use in ~~aircraft~~ helicopters engaged in international air navigation. ~~A HUD~~ These ~~vision~~ systems and hybrid systems may be installed and operated to reduce workload, improve ~~provide~~ guidance, reduce flight technical error and enhance situational awareness and/or to obtain an operational credit by establishing minima below the aerodrome operating minima, for approach ban purposes, or reducing the visibility requirements or requiring fewer ground facilities as compensated for by airborne capabilities. Automatic landing systems, HUD, equivalent displays and vision systems may be installed separately or together as part of a hybrid system. ~~Any operational credit to be obtained from their use requires approval from the BCAA~~.

The installation and operational use of these systems as well as any operational credit that can be derived from their use require BCAA approval.

Subject to, but not limited to, the operator's experience of the airport and limits of the design approval of the equipment, the BCAA may, at its discretion, consider the grant of operational credit for the use of HUD/EVS when operating in instrument conditions.

When obtaining operational credit, the operator is required to apply for an exemption from the Air Navigation Technical Regulations (ANTRs). An exemption can only be granted by the BCAA for a system that utilises a HUD as part of the EVS equipment.

Note 1: "Vision systems" is a generic term referring to the existing systems designed to provide images, i.e. enhanced vision systems (EVS), synthetic vision systems (SVS) and combined vision systems (CVS).

Note 2: Operational credit can be granted only within the limits of the ~~design~~ airworthiness approval.

Note 3: Currently, operational credit has been given only to vision systems containing an image sensor providing a real-time image of the actual external scene on ~~the~~ a HUD.

Note 4: More detailed information and guidance on automatic landing systems, HUD, equivalent displays and vision systems is contained in CAP 33 - Head-Up Displays (HUD) and Enhanced Vision Systems (EVS). This CAP should be consulted in conjunction with this appendix.

(a) HUD and equivalent displays

(1) General

A HUD presents flight information into the pilot's forward external field of view without significantly restricting that external view.

~~A variety of~~ Flight information ~~may~~ shall be presented on a HUD or an equivalent display ~~depending on~~ as required for the intended use (see CAP 33 for further details). ~~flight operation, flight conditions, systems capabilities and operational approval~~. ~~A HUD may include, but is not limited to, the following~~:

~~(i) airspeed;~~

~~(ii) altitude;~~

~~(iii) heading;~~

~~(iv) vertical speed;~~

~~(v) angle of attack;~~

~~(vi) flight path or velocity vector;~~

~~(vii) attitude with bank and pitch references;~~

~~(viii) course and glide path with deviation indications;~~

~~(ix) status indications (e.g. navigation sensor, autopilot, flight director); and~~

~~(ix) alerts and warning displays (e.g. ACAS, wind shear, ground proximity warning).~~

(2) Operational applications

Flight operations with a HUD can improve situational awareness by combining flight information located on head-down displays with the external view to provide pilots with more immediate awareness of relevant flight parameters and situation information while they continuously view the external scene. This improved situational awareness can also reduce errors in flight operations and improve the pilot's ability to transition between instrument and visual references as meteorological conditions change. ~~Flight operations applications may include the following~~:

~~(i) enhanced situational awareness during all flight operations, but especially during taxi, take-off, approach and landing;~~

~~(ii) reduced flight technical error during take-off, approach and landing; and~~

~~(iii) improvements in performance due to precise prediction of touchdown area, tail strike awareness/warning and rapid recognition of and recovery from unusual attitudes.~~

A HUD may be used ~~for the following purposes~~:

(i) As a secondary flight display to supplement conventional flight deck instrumentation. ~~in the performance of a particular task or operation. The primary cockpit instruments remain the primary means for manually controlling or manoeuvring the aircraft; and~~

(ii) or as a primary flight display if certified for this purpose.

~~(1) information presented by the HUD may be used by the pilot in lieu of scanning head-down displays. Operational approval of a HUD for such use allows the pilot to control the aircraft by reference to the HUD for approved ground or flight operations; and~~

~~(2) information presented by the HUD may be used as a means to achieve additional navigation or control performance. The required information is displayed on the HUD. Operational credit, in the form of lower minima, for a HUD used for this purpose may be approved for a particular aircraft or automatic flight control system. Additional credit may also be allowed when conducting HUD operations in situations where automated systems are otherwise used~~.

An approved HUD ~~as a stand-alone system~~, may qualify for operations with reduced visibility or reduced RVR or replace some parts of the ground facilities such as touchdown zone and/or centre line lights. ~~Examples and references to publications in this regard can be found i n the *Manual of All-Weather Operations* (ICAO Doc 9365)~~.

The functions of a HUD may be provided by a suitable equivalent display ~~is one that has at least the following characteristics; a head -up presentation not requiring transition of~~

~~visual attention from head down to head up; displays sensor- derived imagery conformal with the pilots external view; permits simultaneous view of the EVS sensor imagery, required aircraft flight symbology, and the external view; and display characteristics and dynamics are suitable for manual control of the aircraft~~. However, before such systems can be used, the appropriate airworthiness and operational approval should be obtained.

Note: CAP 33 contains further details regarding operational applications.

(3) HUD training

~~Training requirements should be established, monitored and approved by the BCAA. Training requirements should include requirements for recent experience if the BCAA determines that these requirements are significantly different than the current requirements for the use of conventional head -down instrumentation~~.

The operator shall comply with the training and recent experience requirements for operations using HUD or equivalent displays as established by the BCAA. Training programmes shall be approved by the BCAA and the implementation of the training shall be subject to oversight by the BCAA.

~~HUD~~ The training shall address all flight operations for which the HUD or equivalent display is used (see CAP 33 for further details). ~~is designed and operationally approved. Some training elements may require adjustments based on whether the helicopter has a single or dual HUD installation. Training should include contingency procedures required in the event of head -up display degradation or failure. HUD training should include the following elements as applicable to the intended~~:

~~(i) an understanding of the HUD, its flight path, energy management concepts and symbology. This should include operations during critical flight events (e.g. ACAS Traffic Advisory/Resolution Advisory upset and wind shear recovery, engine or system failure);~~

~~(ii) HUD limitations and normal procedures, including maintenance and operational checks performed to ensure normal system function prior to use. These checks include pilot seat adjustment to attain and maintain appropriate viewing angles and verification of HUD operating modes;~~

~~(iii) HUD use during low visibility operations, including taxi, take -off, instrument approach and landing in both day and night conditions. This training should include the transition from head- down to head-up and head-up to head-down operations;~~

~~(iv) failure modes of the HUD and the impact of the failure modes or limitations on crew performance;~~

~~(v) crew coordination, monitoring and verbal call -out procedures for single HUD installations with head-down monitoring for the pilot not equipped with a HUD and head-up monitoring for the pilot equipped with a HUD;~~

~~(vi) crew coordination, monitoring and verbal call -out procedures for dual HUD installations with use of a HUD by the pilot flying the aircraft and either head -up or head-down monitoring by the other pilot;~~

~~(vii) consideration of the potential for loss of situational awareness due to "tunnel vision" (also known as cognitive tunnelling or attention tunnelling);~~

~~(viii) any effects that weather, such as low ceilings and vi sibilities, may have on the performance of a HUD; and~~

~~(x) HUD airworthiness requirements.~~

(b) Enhanced Vision systems (EVS)

(1) General

"Vision systems" is used as a generic term to refer to the existing systems designed to provide images, i.e. enhanced vision systems (EVSs), synthetic vision systems (SVSs) and combined vision systems (CVSs).

Vision systems can display electronic real -time images of the actual external scene achieved through the use of image sensors (i.e. EVS) or display synthetic images, which are derived from the on-board avionic systems (i.e. SVS). Vision systems can also consist of a combination of these two systems, ~~or~~ called combined vision systems (i.e. CVS). Such a system may display electronic real-time images of the external scene using the EVS component of the system. ~~However, the merging of EVS and SVS into a CVS is dependent on the intended function (e.g. whether or not there is intent to achieve operational credit)~~. The information from vision systems may be displayed ~~on a~~ head-up and/or head-down ~~display~~. ~~When enhanced vision imagery is displayed on a HUD, it should be presented to the pilot's external field of view without significantly restricting that external view~~. Operational credit may be granted to vision systems which are appropriately qualified.

~~The enhanced position fixing and guidance provided by SVS may provide additional safety for all phases of flight especially low visibility taxi, take -off, approach and landing operations~~.

Light emitting diode (LED) lights may not be visible to infrared -based vision systems ~~due to the fact that LED lights are not incandescent and they do not have a significant heat signature~~. Operators of such vision systems will need to acquire information about the LED implementation programmes at aerodromes where they intend to operate. More details about the consequences of LED lights are contained in CAP33.

(2) Operational applications

Flight operations with ~~enhanced vision image sensors~~ EVS allow the pilot to view an image of the external scene obscured by darkness or other visibility restrictions. ~~When the external scene is partially obscured, enhanced vision imaging may.~~ The use of EVS will also allow ~~the pilot to acq uire~~ acquisition of an image of the external scene earlier than with natural ~~or~~ unaided vision, hence providing for a smoother transition to references by natural vision. The improved acquisition of an image of the external scene may improve situational awareness.

Vision system imagery may also ~~allow~~ enable pilots to detect other aircraft on the ground, terrain or obstructions on ~~the runway~~ or adjacent to runways or taxiways. ~~A vision system image can also provide visual cues to enable earlier runway alignment and a more~~

~~stabilized approach~~.

~~The combined display of aircraft performance, guidance and imagery may allow the pilot to maintain a more stabilized approach and smoothly transition from enhanced visual references to natural visual references.~~

It may also qualify for operational credit for reduced visibility minima when the images are presented into the pilot's external field of view on a HUD without significantly restricting that view.

(3) Vision systems training

~~Training requirements should be established, monitored and approved by the BCAA. Training requirements should include recency of experience requirements if the BCAA determines that these requirements are significantly different than the current requirements for the use of a HUD without enhanced vision imagery or conventional head-down instrumentation.~~

Training and recent experience requirements shall be established by the BCAA. Training programmes shall be approved by the BCAA and the implementation of the training shall be subject to oversight by the BCAA. Training shall address all flight operations for which the vision system is used.

~~Training should address all flight operations for which the vision system is approved~~. This training should include contingency procedures required in the event of system degradation or failure. Training for situational awareness should not interfere with other required operations. Training for operational credit should also require training on the applicable HUD used to present the enhanced visual imagery (see CAP 33 for further details) . ~~Training should include the following elements as applicable~~:

~~(i) an understanding of the system characteristics and operati onal constraints;~~

~~(ii) normal procedures, controls, modes and system adjustments (e.g. sensor theory including radiant versus thermal energy and resulting images);~~

~~(iii) operational constraints, normal procedures, controls, modes and system adjustments;~~

~~(iv) limitations;~~

~~(v) airworthiness requirements;~~

~~(vi) vision system display during low visibility operations, including taxi, take-off, instrument approach and landing; system use for instrument approach procedures in both day and night conditions;~~

~~(vii) failure modes and the impact of failure modes or limitations upon crew performance, in particular, for two-pilot operations;~~

~~(viii) crew coordination and monitoring procedures and pilot call-out responsibilities;~~

~~(ix) transition from enhanced imagery to visual conditions during runway visual acquisition;~~

~~(x) rejected landing: with the loss of visual cues of the landing area, touchdown zone or rollout area;~~

~~(xi) any effects that weather, such as low ceilings and visibilities, may have on the performance of the vision system; and~~

~~(xii) effects of aerodrome lighting using LED lights.~~

(4) Operational concepts

Instrument approach operations that involve the use of vision systems include ~~the~~ an instrument phase and ~~the~~ a visual phase. The instrument phase ends at the published MDA/H or DA/H unless a missed approach is initiated. Using the EVS or CVS does not change the applicable MDA/H or DA/H. The continued approach to landing from MDA/H or DA/H will be conducted using visual references.

~~The~~ This also applies to operations with vision systems. The difference is that the visual references will be acquired by use of an EVS or CVS, natural vision or ~~a~~ the vision system in combination ~~of the two~~ with natural vision (see Figure 1-1 below).

Down to a defined height in the visual segment, typically at or above 30 m (100 ft), the visual references ~~will~~ may be acquired solely by means of the vision system. The defined height depends on the airworthiness approval and specific approval by the State of the Operator. Below this height the visual references should be solely based on natural vision. In the most advanced applications, the vision system ~~is expected to be able to~~ may be used down to touchdown without the requirement for natural vision acquisition of visual references. ~~Using the EVS or CVS does not change the classification of an instrument approach procedure, since the published DA/H remains unchanged and manoeuvring below DA/H is conducted by visual references acquired by means of the an EVS or CVS~~. This means that such a vision system may be the sole means of acquiring visual references and can be used without natural vision(see CAP 33 for further details).

~~In addition to the operational credit that EVS/CVS is able to provide, these systems may also provide an operational and safety advantage through improved situational awareness, earlier acquisition of visual references and smoother transition to references by natural vision. These advantages are more pronounced for Type A approach operations than for Type B approach operations~~.

EVS operations

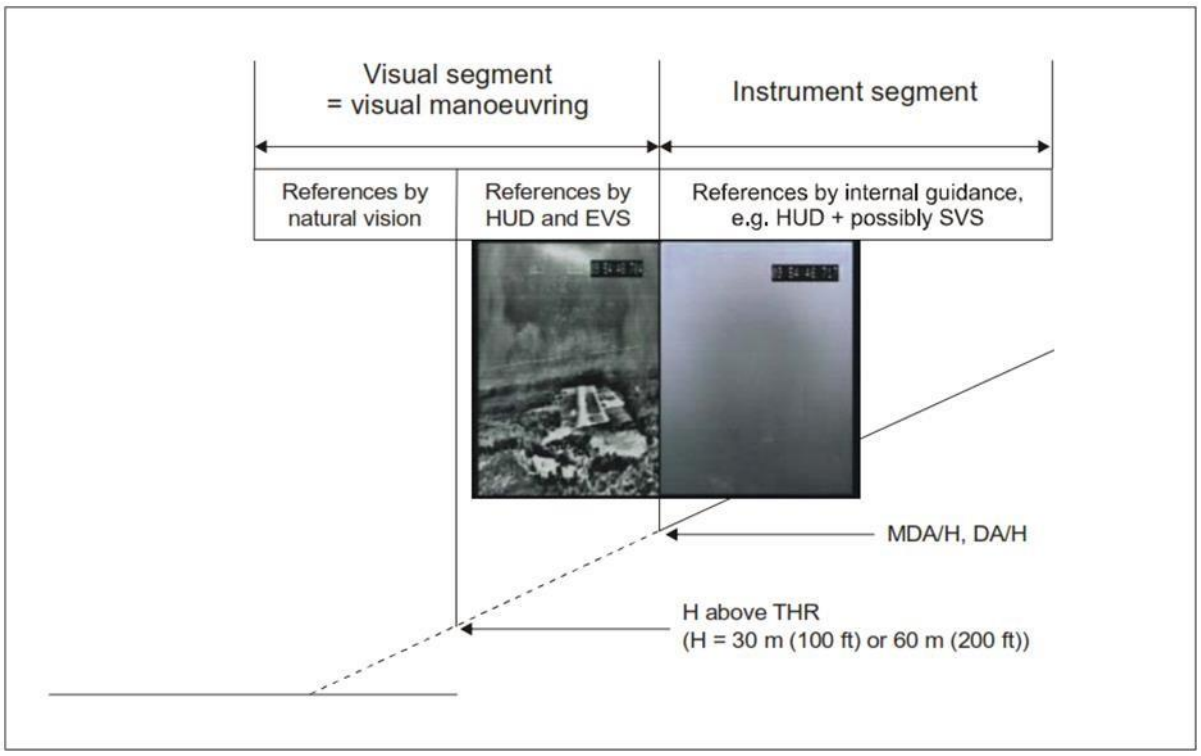

Figure 1-1. EVS operations - transition from instrument to visual references

(6) Visual references

In principle, the required visual references do not change due to the use of an EVS or CVS, but those references are allowed to be acquired by means of either vision system until a certain height during the approach ~~(see Figure 1-1)~~.

~~In regions~~ States that have developed requirements for operations with vision systems, the use of visual references ~~are~~ as indicated in Table 1-1 has been regulated and examples of this are provided in CAP 33.

← Delete Table 1-1

~~**Table 1-1. Examples of operational credits**~~

(c) Hybrid systems

A hybrid system generically means that two or more systems are combined. The hybrid system typically has improved performance compared to each of the component systems, which in turn may qualify for operational credit. ~~Vision systems are normally part of a hybrid system, e.g. EVS is typically combined with a HUD~~. ~~Including more components~~ The inclusion of more systems in the hybrid system normally enhances the performance of the system (See CAP 33 for examples of hybrid systems).

~~Table 1-2 provides some examples of hybrid components. Any combination of the listed systems may constitute a hybrid system. The degree of operational credit that may be given to a hybrid~~

~~system depends on its performance (accuracy, integrity and availability) as assessed and determined by the certification and operational a pproval processes.~~

~~**Table 1-2. Examples of hybrid system components**~~

(d) Operational credits

Aerodrome operating minima are expressed in terms of minimum visibility/RVR and MDA/H or DA/H. ~~With respect to operational credit this means that the visibility/RVR requirements, established in the instrument approach procedure, may be reduced or satisfied for aircraft equipped with appropriately approved vision systems such as EVS. Reasons for granting operational credit may be when aircraft are better equipped than what was originally considered when designing the instrument approach procedure or when runway visual aids considered in the design of the procedure are not available but can be compensated by on- board equipment~~. When aerodrome operating minima are established, the combined capability of the helicopters equipment and on-ground infrastructure should be taken into account. Better equipped helicopters may be able to operate into lower natural visibility conditions, lower DA/H and/or operate with less ground infrastructure. Operational credit means that the aerodrome operating minima may be reduced in case of suitably equipped helicopters. Another way to grant operational credit is to allow visibility requirements to be fulfilled, wholly or partly, by means of the on-board systems. HUD, automatic landing or vision systems were not available at the time when the criteria for aerodrome operating minima were originally established.

~~Credits related to visibility/RVR can be given using at least three concep ts. The first concept is to reduce the required RVR which will allow the aircraft to continue the approach beyond the approach ban point with a reported RVR lower than what was established for the approach procedure. Where a minimum visibility is prescribed, a second concept to grant operational credit may be used. In this case, the required minimum visibility is kept unchanged, but it is satisfied by means of the on-board equipment, typically an EVS. The result of both these concepts is that operations are allowed in meteorological conditions where otherwise they would not be possible. A third concept is to give operational credit by allowing operations in visibility/RVR which are not lower than those established for the approach procedure, but the approach operation is conducted with less facilities on the ground. One example of the latter is to allow category II operations without touchdown and/or centre line lights, compensated by additional on board equipment, e.g. a HUD~~.

~~Granting~~ The granting of operational credits does not affect the classification (i.e. Type or Category) of an instrument approach procedure since ~~instrument approach procedures~~ they are designed to support ~~a given instrument approach operation (i.e. Type, Category). However, the design of those procedures may not take into consideration on-board equipment that may compensate for facilities on the ground~~ instrument approach operations conducted using helicopters with the minimum equipment prescribed.

~~In order to provide optimum service, the ATS may have to be informed about the capabilities of the better equipped aircraft, e.g. which is the minimum RVR required~~.

~~In addition to the operational credit that HUD, vision systems and hybrid systems are able to provide, these systems will also provide an operational and safety advantage through improved situational awareness, earlier acquisition of visual references and smoother transition to references by natural vision. These advantages are more pronounced for 3D Type A approach operations than for Type B approach operations~~.

The relation between the procedure design and the operation can be described as follows. The OCA/H is the end product of the procedure design which does not contain any RVR or visibility values. Based on the OCA/H and all the other elements such as available runway visual aids, the operator will establish MDA/H or DA/H and RVR/visibility, i.e. the aerodrome operating minima. The values derived should not be less than those prescribed by the State of the Aerodrome.

(e) Operational Procedures

~~It is not prohibited to use vision systems in connection with circling. Ho wever, due to the system layout of a vision system and the nature of a circling procedure, key visual references can be obtained only by natural vision, and operational credit is not feasible for existing vision systems. The vision system may provide addit ional situational awareness.~~

~~The operational procedures associated with the use of a HUD, vision systems and hybrid systems should be included in the operations manual. The instructions in the operations manual should include~~. The operator should develop suitable operational procedures associated with the use of an automatic landing system, a HUD or an equivalent display, vision systems and hybrid systems. These procedures should be included in the operations manual and cover at least the following:

(1) ~~any~~ limitations ~~that is imposed by the airworthiness or operational approvals~~;

(2) ~~how~~ operational credits ~~affects~~

(3) flight planning ~~with respect to destination and alternate aerodromes~~;

(4) ground and airborne operations;

~~(5) flight execution, e.g. approach ban and minimum visibility;~~

(5) crew resource management ~~that takes into account the equipment configuration, e.g. the pilots may have different presentation equipment~~;

(6) standard operating procedures ~~e.g. use of autoflight systems, call -outs that may be particular to the vision system or hybrid system, criteria for stabilized approach~~; and

(7) ATS flight plans and radio communication.

(f) ~~Approvals~~ Approval Requirements

General

~~The operator that wishes to conduct operations with, a HUD or equivalent display, vision system or hybrid system will need to obtain certain approvals (See ICAO Annex 6, Part I 4.2.8.1.1 and 6.23, and the corresponding requirements in ICAO Annex 6, Parts II and III). The extent of the approvals will depend on the intended operation and the complexity of the equipment~~.

~~Enhanced vision imagery may be used to improve situational awareness without a specific operational approval. However, the standard operating procedures for these types of operations need to be specified in the operations manual. An example of this type of operation may include an EVS or an SVS on a head -down display that is used only for situational awareness of the surrounding area of the helicopter during ground operations where the display is not in the~~

~~pilot's primary field of view. For enhanced situational awareness, the installation and operational procedures need to ensure that the operation of the vision system does not interfere with normal procedures or the operation or use of other aircraft systems. In some cases, modifications to these normal procedures for other aircraft systems or equipment may be necessary to ensure compatibility.~~

Approval requirements differ based on whether the intended function of the system is to increase situational awareness or to obtain operational credit.

When enhanced vision imagery is used to improve situational awareness, operational approval requirements may be limited. An example of this type of operation may include an EVS or an SVS on a head-down display that is used only for situational awareness of the surrounding area of the helicopter during ground operations where the display is not in the pilot‘s primary field of view. For enhanced situational awareness, the installation and operational procedures need to ensure that the operation of the vision system does not interfere with normal procedures or the operation or use of other helicopter systems. In some cases, modifications to these normal procedures for other helicopter systems or equipment may be necessary to ensure compatibility.

When ~~a vision system or a hybrid system with vision systems imagery~~ EVS is used for operational credit, operational ~~approvals will typically require that the imagery be combined with flight guidance and presented on a HUD. Operational approvals may require that this information also be presented on a head down display. Operational credit may be applied for any flight operation, but credit for instrument approach and take off operations is most common~~ approval standards shall ensure the credit for the individual image sensor or combination of sensors is appropriate. Operational credit may be applied for any flight operation, but credit for instrument approach and landing operations is more common.

~~Operators should be aware that some States may require some information about the operational credit(s) which has been granted by the BCAA for general aviation, and in some cases the State of the Aerodrome may wish to issue an approval or to validate the original approval~~.

Any operational approval (including specific approval for operational credit) that has been granted shall be reflected in the operation specifications for the type or individual helicopter as applicable.

Note: When the application for a specific approval relates to operational credits for systems not including a vision system, the guidance on approvals in this attachment may be used to the extent applicable as determined by the BCAA.

(g) ~~Specific Approvals for operational credit~~ Application Process for EVS/HUD Operational Approval

~~To obtain operational credit the operator will need to specify the desired operational credit and submit a suitable application~~ An application for the approval for the use of HUD/EVS shall be made using the application form, ALD/OPS/F112 on the BCAA website, www.mtt.gov.bh.

The content of a suitable application should include:

(1) *Applicant details - required for all approval requests*. The official name and business or

trading name(s), address mailing address, e -mail address and contact telephone/fax numbers of the applicant.

Note: For AOC holders, the company name, AOC number and e -mail address should be required.

(2) *Aircraft details - required for all approval requests*. Aircraft make(s), model(s) and registration mark(s).

(3) *Operator's vision system compliance list*. The contents of the compliance list are included in Table 1-3 (Section IV) below and in CAP 33. The compliance list should include the information that is relevant to the approval requested and the registration marks of the aircraft involved. If more than one type of aircraft/fleet is included in a single application a completed compliance list should be included for each aircraft/fleet.

The following items ~~should~~ shall be covered in a vision systems compliance list:

(i) reference documents used in compiling the submission for approval;

(ii) flight manual;

(iii) feedback and reporting of significant problems;

(iv) requested operational credit and resulting aerodrome operating minima;

(v) operations manual (or an equivalent document) entries including MEL (where applicable) and standard operating procedures;

(vi) safety risk assessments;

(vii) training programmes; and

(viii) continuing airworthiness

Note 1: Expanded guidance on these items is contained in CAP 33.

Note 2: Application form ALD/OPS/F112 and the Vision Systems Compliance List is contained in CAP 33.

(4) *Documents to be included with the application*. Copies of all documents referred to in column 4 of the operator's vision system compliance list (Table 1 -3 Section IV) should be included when returning the completed application form to the civil aviation BCAA. There should no need to send complete manuals; only the relevant sections/pages should be required.

(5) *Name, title and signature*.

←

Delete Table 1-3

~~**Table 1-3. Example of an AOC vision system compliance list**~~

→ **Insert new table 1-3**

Table 1-3 Application for EVS/HUDLS Operational Approval (ALD/OPS/F112).

APPLICATION FOR HUD/EVS OPERATIONAL APPROVAL

1. Applicant Details		
Operator Name		AOC No:
Address, mailing address		
E-mail address and contact telephone/fax		
2. Aircraft Details - required for all Approval requests Aircraft type(s), series and registration mark(s).		
Aircraft Type		
Aircraft Series		
Registration		
Formal approval will normally be subject to a flight and simulator observation		
3. Documents to be included with the application (refer to section IV)		
SECTION II—Applications for EVS/HUD (please tick as appropriate**)** (1) To be used for situational awareness ☐ and (2) To obtain operational credit ☐ (see Vision Systems Compliance List, Section IV, item 4)		
SECTION III SIGNATURE BLOCK		
Name (BLOCK LETTERS)		
Appointment		
Signature		

SECTION IV VISION SYSTEMS COMPLIANCE LIST			
Main heading	**Expanded areas to be addressed by application**	**Sub-requirements**	**Operator's operations manual reference or document reference**
1. Reference documents used in compiling the submission	The submission shall be based on current up-to-date regulatory material. A compliance statement showing how the criteria of the applicable regulations and requirements have been satisfied.		
2. Aircraft flight manual (AFM)	A copy of the relevant AFM entry showing the aircraft certification basis for the vision system and any operational conditions.		
3. Feedback and reporting of significant problems	An outline of the process for the reporting of failures in the operational use of procedures. *Note: In particular, significant problems with the vision system / HUD system, reporting on circumstances / locations where the vision system was unsatisfactory.*		
4. Requested operational credit and resulting operating minima	The requested operational credit in accordance with the applicable national regulations. Confirmation that all aerodrome operating minima are established in accordance with the method acceptable to the relevant authority.		
5. Operations manual entries and standard operating procedures	Manufacturer/operator-developed. Manufacturer's procedures are recommended as a starting point and shall include at least the items in the sub-requirements column.	Definitions. Check that crew are qualified for EVS/HUD operations MEL handling Equipment required for EVS operations. Types of approach where EVS can be used. Statement that autopilot/flight director should be used whenever possible.	

		Minimum visual references for landing Approach Ban and RVR. Stabilized Approach Criteria. Correct seating and eye position. Crew co-ordination, e.g. duties of PF and PNF: • designation of handling and non-handling pilots; • use of automatic flight control system; • checklist handling; • approach briefing; • radio communications Operations Manual entries and Standard Operating Procedures (contain handling; • monitoring and cross-checking of instruments and radio aids; and • use of the repeater display by PNF Contingency procedures including: • failures above and below decision height; • ILS deviation warnings; • autopilot disconnect; • auto-throttle disconnect; • electrical failures; • engine failure; • failures and loss of visual references at or below decision height; and • EVS/HUDLS failure below normal decision height • wind shear; • ACAS warnings; • EGPWS warnings	
6. Safety risk assessment			

7. Training Programmes	Training programmes including the training syllabi for the system contained in the application.		
8. Continuing Airworthiness	Continuing airworthiness programme for the system contained in the application.		

Any Further Comments to Support Your Application:

BCAA USE

Recommendations: ☐ Approved ☐ Not Approved

Remarks:-

FOI name Signature Date

Recommendation ☐ Approved ☐ Not Approved

Remarks:-

Recommendation ☐ Approved ☐ Not Approved

Remarks:-

DAL Name	Signature	Date

Consequential amendments to ANTR OPS III – Head Up Display (HUD) or Equivalent Visual System (EVS)

1.

ANTR OPS 3.652 IFR or night operations – Flight and navigational instruments and associated equipment

(See AMC OPS 3.650/3.652) (See IEM OPS 3.650/3.652)

……

(q) Where helicopters are equipped with automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of a helicopter shall be approved by the BCAA (see ANTR OPS 3.785).

……

2.

Appendix 1 to ANTR OPS 3.1045 Operations Manual Contents (See IEM to Appendix 1 to ANTR OPS 3.1045)

……

8.4 *AWO*. A description of the operational procedures associated with All Weather Operations. (See OPS 3 Subparts D & E) including instructions and requirements for the use of head up display (HUD) and enhanced vision system (EVS) equipment.

To comply with ICAO Annex 6 Part III – Amendment 20-B

Applicability Date 07 November 2019
To be incorporated in 2019

To comply with ICAO Annex 6 Part III – Amendment 21

1.

Annex Part III, 4.2.2.1

ANTR OPS 3.795 Built-in Lavatory Fire Extinguisher 1-K-18

ANTR OPS 3.795 Built-in Lavatory Fire Extinguisher

Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in a helicopter for which the individual certificate of airworthiness is first issued on or after 31 December 2011 and any extinguishing agent used in a portable fire extinguisher in a helicopter for which the individual certificate of airworthiness is first issued on or after 31 December 2018 shall:

(a) meet the applicable minimum performance requirements of the State of Registry; and

(b) not be of a type listed in the 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer* as it appears in the Eighth Edition of the *Handbook for the Montreal Protocol on Substances that Deplete the Ozone La*yer, Annex A, Group II.

Note: Information concerning extinguishing agents is contained in the UNEP Halons Technical Options Committee Technical Note No. 1 – New Technology Halon Alternatives and FAA Report No. DOT/FAA/AR-99-63, Options to the Use of Halons for Aircraft Fire Suppression Systems.

SUBPART E – ALL WEATHER OPERATIONS

Note: Whenever the use of Flight Simulator or Synthetic Training Device is required by this Subpart, it shall be approved in accordance with the requirements of ANTR- FSTD H.

ANTR OPS 3.430 Heliport or Landing Location Operating Minima - General

(See Appendix 1 to ANTR OPS 3.430)

(a) The operator shall establish, for each heliport or landing location planned to be used, heliport or landing location operating minima that are not lower than the values given in Appendix 1. The method of determination of such minima shall be acceptable to the Authority. Such minima shall not be lower than any that may be established for such heliports or landing locations by the State in which the heliport is located, except when specifically approved by that State.

~~*Note: The above paragraph does not prohibit in-flight calculation of minima for a non-planned alternate heliport or landing location if carried out in accordance with an accepted method.*~~

(b) Notwithstanding paragraph (a) above, in-flight calculation of minima for use at unplanned alternate heliports and/or for approaches utilising EVS shall be carried out in accordance with a method acceptable to the Authority.

Note: The above paragraph does not prohibit in-flight calculation of minima for a non-planned alternate heliport if carried out in accordance with an accepted method.

(c) The BCAA may approve operational credit(s) for operations with helicopters equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS. Such approvals shall not affect the classification of the instrument approach procedure. Operational credit includes:

(1) for the purposes of an approach ban (See ANTR OPS 3.405(b)), a minima below the aerodrome operating minima;

(2) reducing or satisfying the visibility requirements; or

(3) requiring fewer ground facilities as compensated for by airborne capabilities.

Note 1: Guidance on operational credit for aircraft equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS and CVS is contained in ~~the~~ ~~ICAO Manual of All-Weather Operations (Doc 9365)~~ CAP 33.

~~*Note 2: Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the ICAO Manual of All-Weather Operations (Doc 9365).*~~

Note 2: Automatic landing system (helicopter) - is an automatic approach using airborne systems which provide automatic control of the flight path, to a point aligned with the landing surface, from which the pilot can transition to a safe landing by means of natural vision without the use of automatic control.

(d) Prior to the approval of ~~operational credit(s)~~ an automatic landing system, HUD or equivalent displays, EVS, SVS or CVS, the operator shall submit documentation to the BCAA to ensure that:

(1) the equipment meets the appropriate airworthiness certification requirements;

(2) the operator has carried out a safety risk assessment of the operations supported by the automatic landing system, HUD or equivalent displays, EVS, SVS or CVS;

(3) the operator has established and documented procedures for the use of, and training requirements for, automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS.

Note: Guidance on safety risk assessment is contained in ~~the ICAO Safety Management Manual Document 9859~~ ANTR Volume III Part 19.

(e) In establishing the heliport or landing location operating minima which will apply to any particular operation, ~~an~~ the operator shall take full account of:

(1) The type, performance and handling characteristics of the helicopter;

(2) The composition of the flight crew, their competence and experience;

(3) The dimensions and characteristics of the runways/final approach and take-off areas (FATOs) that may be selected for use;

(4) The adequacy and performance of the available visual and non-visual ground aids; (see AMC OPS 3.430(b)(4))

(5) The equipment available on the helicopter for the purpose of navigation, acquisition of visual references and/or control of the flight path, as appropriate, during the take-off, the approach, the flare, the hover, the landing, roll-out and the missed approach;

(6) For the determination of obstacle clearance, the obstacles in the approach, missed approach and the climb-out areas necessary for the execution of contingency procedures are to be considered;

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

(8) The obstacle clearance altitude/height for the instrument approach procedures; and

(9) The means to determine and report meteorological conditions.

ANTR OPS 3.435 Terminology

(a) Terms used in this Subpart and not defined in ANTR Volume 1 have the following meaning:

(1) *Circling*. The visual phase of an instrument approach to bring an aircraft into position for landing which is not suitably located for a straight-in approach.

(2) *Low Visibility Procedures (LVP)*. Procedures applied at a heliport or landing location for the purpose of ensuring safe operations during Category II and III approaches and Low Visibility Take-offs.

(3) *Low Visibility Take-Off (LVTO).* A take-off where the Runway Visual Range (RVR) is less than 400 m.

(4) *Final Approach and Take-Off area (FATO).* A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced and, where the FATO is to be used by helicopters operated in Performance Class 1, includes the rejected take-off area available.

(5) *Visual Approach.* An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed with visual reference to the terrain.

(6) *Cloud base.* The height of the base of the lowest observed, or forecast, cloud element in the vicinity of an aerodrome, or heliport or landing location, or within a specified area of operations. The height of the cloud base is normally measured above aerodrome elevation, but in the case of offshore operations cloud base in measured above mean sea level.

~~(7) *Combined vision system (CVS).* A system to display images from a combination of enhanced vision systems (EVS) and synthetic vision system (SVS).~~

~~(8) *Electronic Flight Bag (EFB).* An electronic information system, comprised of equipment and applications, for flight crew, which allows for storing, updating, displaying and processing of EFB functions to support flight operations or duties.~~

~~(9) *Enhanced vision system (EVS).* A system to display electronic real-time images of the external scene achieved through the use of image sensors.~~

~~*Note: EVS does not include night vision imaging systems (NVIS)*~~

~~(10) *Synthetic vision system (SVS).* A system to display data-derived synthetic images of external scene from the perspective of the flight deck.~~

~~(11) *Continuous Descent Final Approach (CDFA).* A specific technique for flying the final approach segment of a 2D instrument approach procedure as a continuous descent, without level-off, from an altitude / height at or above the Final Approach Fix altitude / height to a point approximately 15m (50ft) above the landing runway threshold or the point where the flare manoeuvre should begin for the type of helicopter flown.~~

~~(12) *Stabilised Approach (SAp).* An approach which is flown in a controlled and appropriate manner in terms of configuration, energy and control of the flight path from a pre-determined point or altitude/height down to a point 50 feet above the threshold or the point where the flare manoeuvre is initiated if higher.~~

~~(11) *Head-Up Display (HUD).* A display system which presents flight information into the pilot's forward external field of view and which does not significantly restrict the external view.~~

~~(12) *Head-Up Guidance Landing System (HUDLS).* The total airborne system which provides head-up guidance to the pilot during the approach and landing and/or go-around. It includes all sensors, computers, power supplies, indications and controls. A HUDLS is typically used for primary approach guidance to decision heights of 50 ft.~~

(13) *Hybrid Head-Up Display Landing System (Hybrid HUDLS).* A system which consists of a primary fail-passive automatic landing system and a secondary independent HUD/HUDLS enabling the pilot to complete a landing manually after failure of the primary system.

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

(14) *Converted Meteorological Visibility (CMV).* A value (equivalent to an RVR) which is derived from the reported meteorological visibility, as converted in accordance with the requirements in this subpart.

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

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

(15) *GNSS Landing System (GLS).* An approach operation using augmented GNSS information to provide guidance to the aircraft based on its lateral and vertical GNSS position. (It uses geometric altitude reference for its final approach slope.)

(16) *Decision Altitude (DA) or Decision Height (DH).* A specific altitude or height in a 3D (precision) approach or approach with vertical guidance at which a missed approach shall be initiated if the required visual reference to continue the approach has not been established.

(17) *Minimum Decent Altitude (MDA) or Minimum Descent Height (MDH).* A specific altitude or height in a 2D (non-precision) approach or circling approach below which descent shall not be made without the required visual reference.

ANTR OPS 3.440 Low visibility operations - General operating rules
(See Appendix 1 to ANTR-OPS 3.440)

(a) ~~An~~ The operator shall not conduct Category II or III operations unless:

(1) Each helicopter concerned is certificated for operations with decision heights below 200 ft, or no decision height, and equipped in accordance with ANTR- AWO or an equivalent accepted by the Authority;

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

(3) The operations are approved by the Authority;

(4) The flight crew consists of at least 2 pilots;

(5) Decision Height is determined by means of a radio altimeter; and

(6) RVR information is provided

(b) ~~An~~ The operator shall not conduct low visibility take-offs in less than 150 m RVR unless approved by the Authority.

ANTR OPS 3.445 Low visibility operations - Heliport or Landing Location considerations

(a) ~~An~~ The operator shall not use an heliport ~~or landing location~~ for Category II or III operations unless the heliport ~~or landing location~~ is approved for such operations by the State in which the heliport ~~or landing location~~ is located.

(b) ~~An~~ The operator shall verify that Low Visibility Procedures (LVP) have been established, and will be enforced, at those heliports ~~or landing locations~~ where low visibility operations are to be conducted.

~~(c) An operator shall not conduct instrument approach and landing operations in less than 800m visibility (heliport operating minima) unless RVR information is provided.~~

ANTR OPS 3.450 Low visibility operations - Training and Qualifications

(See Appendix 1 to ANTR OPS 3.450)

(a) ~~An~~ The operator shall ensure that, prior to conducting Low Visibility Take-Off, Category II and III operations:

(1) Each flight crew member:

(i) Completes the training and checking requirements prescribed in Appendix 1 including flight simulator training in operating to the limiting values of RVR and Decision Height appropriate to the operator's Category II/III approval; and

(ii) Is qualified in accordance with Appendix 1;

(2) The training and checking is conducted in accordance with a detailed syllabus approved by the Authority and included in the Operations Manual. This training is in addition to that prescribed in ANTR OPS ~~Part~~ 3, Subpart N; and

(3) The flight crew qualification is specific to the operation and the helicopter type.

ANTR OPS 3.455 Low Visibility operations - Operating Procedures (LVPs)

(See Appendix 1 to ANTR OPS 3.455)

(a) ~~An~~ The operator shall establish procedures and instructions to be used for Low Visibility Take-Off and Category II and III operations. These procedures shall be included in the Operations Manual and contain the duties of flight crew members during taxiing, take-off, approach, flare, the hover, landing, roll-out and missed approach as appropriate.

(b) The commander shall satisfy himself that:

(1) The status of the visual and non-visual facilities is sufficient prior to commencing a Low Visibility Take-Off or a Category II or III approach;

(2) Appropriate LVPs are in force according to information received from Air Traffic Services, before commencing a Low Visibility Take-Off or a Category II or III approach; and

(3) The flight crew members are properly qualified prior to commencing a Low Visibility Take-off in an RVR of less than 150 m or a Category II or III approach.

ANTR OPS 3.460 Low visibility operations - Minimum equipment

(a) ~~An~~ The operator ~~shall~~ shall include in the Operations Manual the minimum equipment that has to be serviceable at the commencement of a Low Visibility Take-off or a Category II or III approach in accordance with the HFM or other approved document.

(b) The commander shall satisfy himself that the status of the helicopter and of the relevant airborne systems is appropriate for the specific operation to be conducted.

ANTR OPS 3.465 VFR Operating minima

(See Appendices 1 and 2 to ANTR OPS 3.465)

(a) ~~An~~ The operator shall ensure that:

(1) VFR flights are conducted in accordance with the Visual Flight Rules and in accordance with the Table in Appendix 1 to ANTR OPS 3.465;

(2) Subject to sub-paragraph (3) and (4) below, helicopters are operated in a flight visibility of not less than 1 500 m during daylight and not less than 5 km by night. Flight visibility may be reduced to 800 m for short periods during daylight, when in sight of land, if the helicopter is manoeuvred at a speed that will give adequate opportunity to observe other traffic and any obstacles in time to avoid a collision (see AC OPS 3.465.). Low level overwater flights out of sight of land are only to be conducted under VFR when the cloud ceiling is greater than 600 ft by day and 1 200 ft by night.

(3) In Class G airspace, when flying between helidecks where the overwater sector is less than 10 nm, VFR flights are conducted in accordance with Appendix 2 to ANTR OPS 3.465; and

(4) Special VFR flights comply with any State or Zone minima in force.

Appendix 1 to ANTR OPS 3.430

Heliport or Landing Location Operating Minima

(See IEM to Appendix 1 to ANTR OPS 3.430)

(a) *Take-off Minima*

(1) *General*

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

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

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

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

(2) *Visual reference*.

(i) The take-off minima shall be selected to ensure sufficient guidance to control the helicopter in the event of both a discontinued take-off in adverse circumstances and a continued take-off after failure of the critical power unit.

(ii) For night operations ground lighting shall be available to illuminate the FATO/runway and any obstacles unless otherwise agreed by the Authority.

(3) *Required RVR/Visibility*

(i) For Performance Class 1 operations, an operator shall establish an RVR and visibility respectively (RVR/VIS) as take-off minima in accordance with the following table (See IEM to Appendix 1 to ANTR OPS 3.430 sub-paragraph (a)(3)(i):

Table 1 - RVR/Visibility for take-off

Onshore heliports or landing locations with IFR departure procedures	**RVR/Visibility**
No lighting and no markings (Day)	250m or the rejected take-off distance, whichever is greater
No markings (Night)	800m
Runway edge/FATO lighting and centre line marking	200m
Runway edge/FATO lighting, centre line marking and RVR information	150m
Offshore Helideck	
Two pilot operations	250m (1)
Single pilot operations	500m (1)

Note 1: The commander shall establish that the take-off flight path is free of obstacles.

(ii) For Performance Class 2 operations onshore, the commander shall operate to take-off minima of 800 m RVR/VIS and remain clear of cloud during the take-off manoeuvre until reaching Performance Class 1 capabilities.

(iii) For Performance Class 2 operations offshore, the commander shall operate to minima not less than that for Class 1 and remain clear of cloud during the take-off manoeuvre until reaching Performance Class 1 capabilities. (See note 1 to Table 1 above.)

(iv) Table 6 below, for converting reported meteorological visibility to RVR, shall not be used for calculating take-off minima.

(b) ~~*2D instrument approach operations*~~ *Non-Precision approach*

(1) *System minima*

(i) An operator shall ensure that system minima for ~~2D instrument~~ non-precision approach ~~procedures~~, which are based upon the use of ILS without glidepath (LLZ only), VOR, NDB, SRA and VDF are not lower than the MDH values given in Table 2 below.

Table 2 – System minima for ~~2D instrument~~ non-precision approach aids

System minima	
Facility	**Lowest MDH**
ILS (no glide path – LLZ)	250 ft
SRA (terminating at ½ nm)	250 ft
SRA (terminating at 1 nm)	300 ft
SRA (terminating at 2 nm)	350 ft
VOR	300 ft
VOR/DME	250 ft
NDB	300 ft
VDF (QDM & QCH)	300 ft

(2) *Minimum Descent Height*. An operator shall ensure that the minimum descent height for a ~~2D instrument~~ non-precision approach is not lower than either:

(i) The OCH/OCL for the category of helicopter; or

(ii) The system minimum.

(3) *Visual Reference*. A pilot may not continue an approach below MDA/MDH unless at least one of the following visual references for the intended FATO/runway is distinctly visible and identifiable to the pilot:

(i) Elements of the approach light system;

(ii) The threshold;

(iii) The threshold markings;

(iv) The threshold lights;

(v) The threshold identification lights;

(vi) The visual glide slope indicator;

(vii) The touchdown zone or touchdown zone markings;

(viii) The touchdown zone lights;

(ix) FATO/Runway edge lights; or

(x) Other visual references accepted by the Authority.

(4) *Required RVR*. (See AMC OPS 3.430(b)(4).)

(i) For ~~2D instrument~~ non-precision approaches by helicopters operated in Performance Class 1 or 2, the minima given in the following Table shall apply:

Table 3 – Onshore ~~2D instrument~~ Non-precision Approach Minima

Onshore ~~2D Instrument~~ Non-precision Approach Minima (5)(6)(7)				
MDH (ft)	**Facilities/RVR**			
	Full (1)	**Intermediate (2)**	**Basic (3)**	**Nil (4)**
250-299 ft	600 m	800 m	1 000 m	1 000 m
300-449 ft	800 m	1 000 m	1 000 m	1 000 m
450 ft and above	1 000 m	1 000 m	1 000 m	1 000 m

Note 1: Full facilities comprise FATO/runway markings, 720 m or more of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights shall be on.

Note 2: Intermediate facilities comprise FATO/runway markings, 420 - 719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights shall be on.

Note 3: Basic facilities comprise FATO/runway markings, <420 m HI/MI approach lights, any length of LI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights shall be on.

Note 4: Nil approach light facilities comprise FATO/runway markings, FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.

Note 5: The tables are only applicable to conventional approaches with a nominal descent slope of not greater than 4°. Greater descent slopes will usually require that visual glide slope guidance (e.g. PAPI) is also visible at the Minimum Descent Height.

Note 6: The above figures are either reported RVR or meteorological visibility converted to RVR as in sub-paragraph (h) below.

Note 7: The MDH mentioned in Table 3 refers to the initial calculation of MDH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest ten feet, which may be done for operational purposes, e.g. conversion to MDA.

(ii) Where the missed approach point is within ½ nm of the landing threshold, the approach minima given for full facilities may be used regardless of the length of approach lighting available. However, FATO/runway edge lights, threshold lights, end lights and FATO/runway markings are still required.

(iii) *Night operations*. For night operations ground lighting shall be available to illuminate the FATO/runway and any obstacles unless otherwise agreed by the Authority.

(iv) *Single pilot operations*. For single pilot operations the minimum RVR is 800 m or the Table 3 minima whichever is higher.

(c) ~~*3D instrument approach operation*~~ *Precision approach - Category I*

(1) *General*. A Category I operation is a ~~3D~~ precision instrument approach operation using ILS, MLS ~~GLS (GNSS/GBAS)~~ or PAR with a decision height not lower than 200 ft and with either a visibility not less than 800 m or a runway visual range not less than ~~550~~ 500m.

(2) *Decision Height*. An operator shall ensure that the decision height to be used for a Category I ~~3D instrument~~ precision approach is not lower than:

(i) The minimum decision height specified in the Helicopter Flight Manual (HFM) if stated;

(ii) The minimum height to which the ~~3D instrument~~ precision approach aid can be used without the required visual reference;

(iii) The OCH/OCL for the category of helicopter; or

(iv) 200 ft.

(3) *Visual Reference*. A pilot may not continue an approach below the Category I decision height, determined in accordance with sub-paragraph (c)(2) above, unless at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:

(i) Elements of the approach light system;

(ii) The threshold;

(iii) The threshold markings;

(iv) The threshold lights;

(v) The threshold identification lights;

(vi) The visual glide slope indicator;

(vii) The touchdown zone or touchdown zone markings;

(viii) The touchdown zone lights; or

(ix) FATO/runway edge lights.

(4) *Required RVR*. For Category I operations by Performance Class 1 and 2 helicopters the following minima shall apply:

Table 4 - Onshore ~~3D Instrument~~ Precision Approach Minima - Category I

Onshore ~~3D Instrument~~ Precision Approach Minima Category I (5)(6)(7)				
DH (ft)	**Facilities/RVR**			
	Full (1)	**Intermediate (2)**	**Basic (3)**	**Nil (4)**
200 ft	500 m	600 m	700 m	1 000 m
201-250 ft	550 m	650 m	750 m	1 000 m
251-300 ft	600 m	700 m	800 m	1 000 m
301 ft & above	750 m	800 m	900 m	1 000 m

Note 1: Full facilities comprise FATO/runway markings, 720 m or more of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights shall be on.

Note 2: Intermediate facilities comprise FATO/runway markings, 420 - 719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights shall be on.

Note 3: Basic facilities comprise FATO/runway markings, <420 m of HI/MI approach lights, any length of LI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights shall be on.

Note 4: Nil approach light facilities comprise FATO/runway markings, FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.

Note 5: The above figures are either the reported RVR or meteorological visibility converted to RVR in accordance with paragraph (h).

Note 6: The Table is applicable to conventional approaches with a glide slope angle up to and including 4°.

Note 7: The DH mentioned in the Table 4 refers to the initial calculation of DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest ten feet, which may be done for operational purposes, (e.g. conversion to DA).

(i) *Night operations*. For night operations ground lighting shall be available to illuminate the FATO/runway and any obstacles unless otherwise agreed by the Authority.

(ii) *Single pilot operations*. For single pilot operations, an operator shall calculate the minimum RVR for all approaches in accordance with ANTR OPS 3.430 and this Appendix. An RVR of less than 800 m is not permitted except when using a suitable autopilot coupled to an ILS or MLS, in which case normal minima apply. The Decision Height applied shall not be less than 1·25 x the minimum use height for the autopilot.

(d) *Onshore ~~3D instrument~~ precision approach - Category II operations* (See IEM to ANTR OPS 3.430, sub-paragraph (d))

(1) *General*. A Category II operation is a ~~3D~~ precision instrument approach and landing using ILS or MLS with:

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

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

(2) *Decision Height*. An operator shall ensure that the decision height for a Category II operation is not lower than:

(i) The minimum decision height specified in the HFM;

(ii) The minimum height to which the ~~3D instrument~~ precision approach aid can be used without the required visual reference;

(iii) The OCH/OCL for the category of helicopter;

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

(v) 100 ft.

(3) *Visual reference*. A pilot may not continue an approach below the Category II decision height determined in accordance with sub-paragraph (d)(2) above unless visual reference containing a segment of at least 3 consecutive lights

being the centre line of the approach lights, or touchdown zone lights, or FATO/runway centre line lights, or FATO/runway edge lights, or a combination of these is attained and can be maintained. This visual reference shall include a lateral element of the ground pattern, i.e. an approach lighting crossbar or the landing threshold or a barette of the touchdown zone lighting.

(4) *Required RVR.* For Category II approaches by performance class 1 helicopters, the following minima shall apply:

Table 5 - RVR for Category II approach vs. DH

Onshore ~~3D Instrument~~ Precision Approach Minima – Category II	
Decision height	**Auto-coupled to below DH (1) RVR**
100 - 120 ft	300 m
121 - 140 ft	400 m
141 ft and above	450 m

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

(e) *Intentionally blank*

(f) *Onshore circling*

(1) Circling is the term used to describe the visual phase of an instrument approach, to bring an aircraft into position for landing on a FATO/runway which is not suitably located for a straight in approach.

(2) For circling the specified MDH shall not be less than 250 ft, and the meteorological visibility shall not be less than 800 m.

Note: Visual manoeuvring (circling) with prescribed tracks is an accepted procedure within the meaning of this paragraph.

(g) *Visual Approach.* An operator shall not use an RVR of less than 800 m for a visual approach.

(h) *Conversion of Reported Meteorological Visibility to RVR*

(1) An operator shall ensure that a meteorological visibility to RVR conversion is not used for calculating take-off minima, Category II or III minima or when a reported RVR is available.

(2) When converting meteorological visibility to RVR in all other circumstances than those in sub-paragraph (h)(1) above, an operator shall ensure that the following Table is used:

Table 6 - Conversion of visibility to RVR

Lighting elements in operation	**RVR = met. visibility multiplied by:**	
	Day	Night
Hi approach and runway lighting	1·5	2·0
Any type of lighting	1·0	1·5
No lighting	1·0	Not applicable

(i) *Airborne Radar Approach (ARA) for overwater operations* (See IEM to Appendix 1 to ANTR OPS 3.430, sub-paragraph (i)

(1) *General*

(i) An operator shall not conduct ARAs unless authorised by the Authority.

(ii) Airborne Radar Approaches are only permitted to rigs or vessels under way when a multi-crew concept is used.

(iii) A commander shall not undertake an Airborne Radar Approach unless the radar can provide course guidance to ensure obstacle clearance.

(iv) Before commencing the final approach the commander shall ensure that a clear path exists on the radar screen for the final and missed approach segments. If lateral clearance from any obstacle will be less than 1.0 nm, the commander shall:

(A) Approach to a nearby target structure and thereafter proceed visually to the destination structure; or

(B) Make the approach from another direction leading to a circling manoeuvre.

(v) The Commander shall ensure that the cloud ceiling is sufficiently clear above the helideck to permit a safe landing.

(2) *Minimum Descent Height (MDH)*. Notwithstanding the minima at sub-paragraphs (i) and (ii) below, the MDH shall not be less than 50 ft above the elevation of the helideck.

(i) The MDH is determined from a radio altimeter. The MDH for an airborne radar approach shall not be lower than:

(A) 200 ft by day;

(B) 300 ft by night.

(ii) The MDH for an approach leading to a circling manoeuvre shall not be lower than:

(A) 300 ft by day;

(B) 500 ft by night.

(3) *Minimum descent altitude (MDA)*. An MDA may only be used if the radio altimeter is unserviceable. The MDA shall be a minimum of MDH +200 ft and shall be based on a calibrated barometer at the destination or on the lowest forecast QNH for the region.

(4) *Decision range*. The Decision Range shall not be less than 0·75 nm unless an operator has demonstrated to the Authority that a lesser Decision Range can be used at an acceptable level of safety.

(5) *Visual reference*. No pilot may continue an approach beyond Decision Range or below MDH/MDA unless he is visual with the destination.

(6) *Single pilot operations*. The MDH/MDA for a single pilot ARA shall be 100 ft higher than that calculated using sub-paragraphs (2) and (3) above. The Decision Range shall not be less than 1·0 nm.

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SECTION 2

ADVISORY CIRCULAR (AC) / ACCEPTABLE MEANS OF COMPLIANCE (AMC) / INTERPRETATIVE AND EXPLANATORY MATERIAL (IEM)

1 *GENERAL*

1.1 This Section contains Advisory Circulars (AC), Acceptable Means of Compliance and Interpretative / Explanatory Material that has been agreed for inclusion in ANTR OPS 3.

1.2 Where a particular ANTR paragraph does not have an Advisory Circular, Acceptable Means of Compliance or any Interpretative / Explanatory Material, it is considered that no supplementary material is required.

2 *PRESENTATION*

2.1 The Advisory Circular, The Acceptable Means of Compliance and Interpretative / Explanatory Material are presented in full page width on loose pages, each page being identified by the date of issue.

2.2 A numbering system has been used in which the Advisory Circular, the Acceptable Means of Compliance or Interpretative / Explanatory Material uses the same number as the ANTR paragraph to which it refers. The number is introduced by the letters AMC or IEM to distinguish the material from the ANTR itself.

2.3 The acronyms AC, AMC and IEM also indicate the nature of the material and for this purpose the two types of material are defined as follows:

Advisory Circulars (AC) provide guidelines on a subject matter, such as how to comply with a regulation.

Acceptable Means of Compliance (AMC) illustrate a means, or several alternative means, but not necessarily the only possible means by which a requirement can be met. It should however be noted that where a new AMC is developed, any such AMC (which may be additional to an existing AMC) will be amended into the document following consultation under the NPA procedure.

Interpretative / Explanatory Material (IEM) helps to illustrate the meaning of a requirement.

2.4 New AMC or IEM material may, in the first place, be made available rapidly by being published as a Temporary Guidance Leaflet (TGL) or Civil Aviation Publication (CAP).

Note: Any person who considers that there may be alternative AMCs or IEMs to those published should submit details to the Authority, for alternatives to be properly considered.

2.5 New, amended and corrected text will be indicated with a side bar beside paragraphs, until a subsequent “amendment” is issued.

AC/AMC/IEM E – ALL WEATHER OPERATIONS

AMC OPS 3.430(b)(4)
Effect on Landing Minima of temporarily failed or downgraded Ground Equipment
See ANTR OPS 3.430(b)(4)

1 Introduction

1.1 This provides operators with instructions for flight crews on the effects on landing minima of temporary failures or downgrading of ground equipment.

1.2 Aerodrome facilities are expected to be installed and maintained to the standards prescribed in ICAO Annexes 10 and 14. Any deficiencies are expected to be repaired without unnecessary delay.

2 General. These instructions are intended for use both pre-flight and in-flight. It is not expected however that the commander would consult such instructions after passing the outer marker or equivalent position. If failures of ground aids are announced at such a late stage, the approach could be continued at the commander's discretion. If, however, failures are announced before such a late stage in the approach, their effect on the approach should be considered as described in Tables 1A and 1B below, and the approach may have to be abandoned to allow this to happen.

3 Operations with no Decision Height (DH)

3.1 An operator should ensure that, for helicopters authorised to conduct no DH operations with the lowest RVR limitations, the following applies in addition to the content of Tables 1A and 1B, below:

i. RVR. At least one RVR value shall be available at the aerodrome;

ii. FATO/runway lights

a. No FATO/runway edge lights, or no centre lights - Day only min RVR 200 m;

b. No TDZ lights - No restrictions;

c. No standby power to FATO/runway lights - Day only min RVR 200 m.

4. Conditions applicable to Tables 1A & 1B

i. Multiple failures of FATO/runway lights other than indicated in Table 1B are not acceptable.

ii. Deficiencies of approach and FATO/runway lights are treated separately.

iii. Category II or III operations. A combination of deficiencies in FATO/runway lights and RVR assessment equipment is not allowed.

iv. Failures other than ILS affect RVR only and not DH.

TABLE 1A – Failed or downgraded equipment – effect on landing minima

FAILED OR DOWNGRADED EQUIPMENT	EFFECT ON LANDING MINIMA				
	CAT III B (Note 1)	CAT III A	CAT II	CAT I	NON PRECISION ~~2D~~
ILS stand-by transmitter	Not allowed		No effect		
Outer Marker	No effect if replaced by published equivalent position				Not applicable
Middle Marker	No effect				No effect unless used as MAPT
Touch Down Zone RVR assessment system	May be temporarily replaced with midpoint RVR if approved by the State of the Aerodrome. RVR may be reported by human observation			No effect	
Midpoint or Stop End RVR	No effect				
Anemometer for R/W in use	No effect if other ground source available				
Ceilometer	No effect				

Note 1: For Cat IIIB operations with no DH, see also paragraph 3, above.