

## Annex I to ED Decision 2022/012/R

### **‘GM to Annex I (Definitions for terms used in Annexes II to VIII) to Commission Regulation (EU) No 965/2012 — Issue 1, Amendment 16’**

The text of the amendment is arranged to show deleted, new or amended text as shown below:

- (a) deleted text is ~~struck through~~;
- (b) new or amended text is highlighted in **blue**;
- (c) an ellipsis ‘[...]’ indicates that the rest of the text is unchanged.

#### **Note to the reader**

*In amended, and in particular in existing (that is, unchanged) text, ‘Agency’ is used interchangeably with ‘EASA’. The interchangeable use of these two terms is more apparent in the consolidated versions. Therefore, please note that both terms refer to the ‘European Union Aviation Safety Agency (EASA)’.*

The Annex to ED Decision N° 2012/015/Directorate R of 24 October 2012 of the Executive Director of the European Aviation Safety Agency is amended as follows:

## GM1 Annex I Definitions

### DEFINITIONS FOR TERMS USED IN ACCEPTABLE MEANS OF COMPLIANCE AND GUIDANCE MATERIAL

(...)

~~(aa) 'Space-based augmentation system (SBAS)' means a wide coverage augmentation system that augments and/or integrates the information obtained from the other GNSS elements with information from a satellite-based transmitter. The most common form of SBAS in Europe is the European Geostationary Navigation Overlay Service (EGNOS).~~

(...)

## GM2 Annex I Definitions

### ABBREVIATIONS AND ACRONYMS

**2D** two-dimensional

**3D** three-dimensional

(...)

~~Baro VNAV~~ **Baro VNAV** barometric VNAV

(...)

**CVS** combined vision system

(...)

**FAS** final approach segment

(...)

**EFVS** enhanced flight vision system

**EFVS-A** enhanced flight vision system used for approach

**EFVS-L** enhanced flight vision system used for landing

(...)

**FOV** field of view

(...)

**IAP** instrument approach procedure

(...)

**LSAA** landing system assessment area

(...)

**OFZ** obstacle free zone

(...)

PVD paravisual display

(...)

SA CAT I special authorisation category I

SA CAT II special authorisation category II

SapSAP stabilised approach

SVS synthetic vision system

(...)

TDZE touchdown zone elevation

(...)

VSS visual segment surface

(...)

## GM31 Annex I Definitions

### DEFINITIONS OF TERMS RELATED TO ALL-WEATHER OPERATIONS

The following terms and concepts are used in the provisions related to all-weather operations in the AMC and GM to Regulation (EU) No 965/2012:

'Advanced aircraft' means an aircraft with equipment in addition to that required for a basic aircraft for a given take-off, approach or landing operation.

'AFM or additional data from the TC/STC holder' — an AFM or additional data from the TC/STC holder may provide:

- limitations, in accordance with which the aircraft must be operated, as described under point 4.1 of Annex V to Regulation (EU) 2018/1139. This means that the aircraft may NOT exceed those given values; or
- demonstrated capabilities, which are the assumptions, envelope or conditions that were used to demonstrate adequate performance to comply with the appropriate certification specifications.

However, some AFMs (especially for those aircraft or landing systems that were certified before the introduction of CS-AWO Issue 2) may not include all of the assumptions, envelope or conditions that were used to demonstrate adequate performance. Information regarding the assumptions, envelope, or conditions that were used to demonstrate adequate performance of a landing system can be provided by equivalent documentation issued by TC/STC holder.

Other types of information issued by the TC/STC holder may include(not an exhaustive list):

- equivalence between different aircraft models (types);

- equivalence between aircraft types and variants;
- landing systems equivalence;
- a list of runways with their demonstrated performance;
- a letter of no-technical objection/ evaluation letter.

Note: 'TC/STC holder' should be understood as the holder of the certificate for the landing system.

'Basic aircraft' means an aircraft which has the minimum equipment required to perform the intended take-off, approach or landing operation.

'Continuous descent final approach (CDFA)': when the circling altitude/height is reached, it is acceptable to maintain altitude (level-off) and transition to the visual segment. The operator may provide a point in the visual segment in which the descent may be resumed to follow a continuous descent to a point approximately 15 m (50 ft) above the landing runway threshold or the point where the flare manoeuvre begins for the type of aircraft flown.

'Enhanced flight vision system (EFVS)-Approach (EFVS-A)' means a system that has been demonstrated to meet the criteria to be used for approach operations from a decision altitude/height (DA/H) or a minimum descent altitude/height (MDA/H) to 100 ft (30 m) threshold elevation while all system components are functioning as intended, but may have failure modes that could result in the loss of EFVS capability. It should be assumed for an EFVS-A that:

- (a) the pilot will conduct a go-around at or above 100 ft threshold elevation, in the event of an EFVS failure; and
- (b) descent below 100 ft above the threshold elevation through to touchdown and roll-out should be conducted using natural vision so that any failure of the EFVS does not prevent the pilot from completing the approach and landing.

'Enhanced flight vision system (EFVS)-Landing (EFVS-L)' means a system that has been demonstrated to meet the criteria to be used for approach and landing operations that rely on sufficient visibility conditions to enable unaided roll-out and to mitigate for loss of EFVS function.

'Head-up display (HUD) or equivalent display system' means a display system which presents flight information to the pilot's forward external field of view (FOV), and which does not significantly restrict the external view.

'Landing system' means an airborne equipment, which:

- (a) provides automatic control of the aircraft during the approach and landing (i.e. automatic landing system); or
- (b) has been demonstrated to meet the criteria to be used for approach and landing operations (e.g. HUD landing system, EFVS-L or any other approved system).

'Landing system assessment area (LSAA)' means the part of the runway that extends from the threshold to a distance of 600 m from the threshold.

Note — Although the landing systems certification criteria use a value greater than 600 m after the threshold to evaluate limit conditions, for the purpose of flight operations assessment a distance of

600 m is the relevant part as landing beyond this point is not expected to occur in day-to-day operations. The LSAA may not necessarily be coincident with the touchdown zone. The touchdown zone is specified in CS-ADR DSN.

‘Low-visibility procedures (LVPs)’ means procedures applied by an aerodrome for the purpose of ensuring safety during low-visibility operations (LVOs).

Regular runway means a runway whose characteristics fit within the acceptable limits demonstrated by the original equipment manufacturer (OEM) during certification. The classification of a runway as a ‘regular runway’ is different from one set of equipment to another.

‘Required visual reference’ refers to that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach, the required visual reference is the runway environment.

‘Satellite-based augmentation system (SBAS)’ means a wide coverage augmentation system in which the user receives augmentation information from a satellite-based transmitter. The most common form of SBAS in Europe is the European Geostationary Navigation Overlay Service (EGNOS).

‘Synthetic vision system (SVS)’ means a system that displays data derived synthetic images of the external scene from the perspective of the flight deck.

‘Landing area’ means that part of a movement area intended for the landing or take-off of aircraft.

‘Touchdown zone (TDZ)’ means the portion of a runway, beyond the threshold, where landing aeroplanes are intended to first contact the runway.

‘Type B instrument approach operations categories’: where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with requirements of the most demanding category. This does not apply if the RVR and/or DH has been approved as operational credits.

## GM32 Annex I Definitions

### EFVS — DIFFERENCES WITH ENHANCED VISION SYSTEMS (EVSs)

#### (a) Introduction to EVSs

EVSs use sensing technology to improve a pilot’s ability to detect objects and topographical features ahead of the aircraft. Different types of sensing technology are used on different aircraft installations. Sensing technologies used include forward-looking infrared, millimetre wave radiometry, millimetre wave radar or low-light level intensification; additional technologies may be developed in the future. The image from sensors may be displayed to the pilot in a number of different ways including ‘head-up’ and ‘head-down’ displays.

#### (b) EVSs and EFVSs

An EFVS is an EVS that is integrated with a flight guidance system, which presents the image from sensors to the pilot on a head-up display (HUD) or equivalent display. If EFVS equipment is certified according to the applicable airworthiness requirements and an operator holds the

necessary specific approval, then an EFVS may be used for EFVS operations. An EFVS operation is an operation with an operational credit which allows operating in visibility conditions lower than those in which operations without the use of EFVS are permitted.

(c) Functions of EVSs

Depending on the capabilities of the particular system, EVSs may be useful during operations at night or in reduced visibility for the following:

- (1) improving visibility of airport features and other traffic during ground operations;
- (2) displaying terrain and obstructions in flight;
- (3) displaying weather in flight;
- (4) improving visibility of the runway environment during approach operations; and
- (5) improving visibility of obstructions on a runway (e.g. aircraft, vehicles or animals) during take-off and approach operations.

(d) Limitations of EVSs

EVSs are a useful tool for enhancing situational awareness; however, each EVS installation has its own specific limitations. These may include:

- (1) Performance variations depend on conditions including ambient temperature and lighting and weather phenomena. A system may provide very different image qualities in the same visibility depending on the particular phenomena causing restricted visibility, e.g. haze, rain, fog, snow, dust, etc.
- (2) An EVS may not be able to detect certain types of artificial lighting. Light emitting diode (LED) lights have a much lower infrared signature than incandescent lights and therefore may not be detected by some types of EVSs. LED lighting is used for runway, taxiway and approach lighting at many airports.
- (3) Monochrome display. EVSs will generally not be able to detect and display the colour of airport lighting. This means that colour coding used on airport lighting will not be visible to the pilot using an EVS.
- (4) Many EVS installations do not have redundancy, so a single failure may lead to loss of EVS image.
- (5) The location of the sensor on the airframe may mean that in certain conditions it could be susceptible to ice accretion or obscuration from impact damage from objects such as insects or birds.
- (6) Where an EVS image is presented on a HUD or an equivalent display, the image needs to be consistent with the pilot's external view through the display. Particular installations may have limitations on the conditions under which this consistent image can be generated (e.g. crosswind conditions during approach).
- (7) Imaging sensor performance can be variable and unpredictable. Pilots should not assume that a flightpath is free of hazards because none are visible in an EVS image.

**(e) Considerations for the use of EVSs**

EVSs may be used in all phases of flight and have significant potential to enhance the pilot's situational awareness. No specific approval is required for the use of an EVS; however, the operator is responsible for ensuring that the flight crew members have received training on the equipment installed on their aircraft in accordance with ORO.FC.120. In addition, the operator is responsible for evaluating the risks associated with system limitations and for implementing suitable mitigation measures in accordance with ORO.GEN.200(a)(3) before using the EVS.

The use of EVSs does not permit the use of different operating minima, and EVS images cannot replace natural vision for the required visual reference in any phase of flight including take-off, approach or landing.

An EVS that is not an EFVS cannot be used for EFVS operations and therefore does not obtain an operational credit.

**GM33 Annex I Definitions****INSTRUMENT APPROACH OPERATIONS**

- (a) Depending on the instrument approach procedure (IAP) in use, the lateral and vertical navigation guidance for an instrument approach operation may be provided by:
- (1) a ground-based radio navigation aid; or
  - (2) computer-generated navigation data from ground-based, space-based or self-contained navigation aids or a combination of these.
- (b) A non-precision approach (NPA) procedure flown as CDFAs with vertical path guidance calculated by on-board equipment is considered to be a 3D instrument approach operation. Depending on the limitations of the equipment and information sources used to generate vertical guidance, it may be necessary for the pilot to cross-check this guidance against other navigational sources during the approach and to ensure that the minimum altitude/height over published step-down fixes is observed. CDFAs with manual calculation of the required rate of descent are considered 2D operations.
- (c) Further guidance on the classification of an instrument approach operation based on the designed lowest operating minima is contained in Appendix J to ICAO Doc 9365 Manual of All-Weather Operations, Fourth Edition, 2017.

**GM34 Annex I Definitions****DECISION ALTITUDE (DA) OR DECISION HEIGHT (DH)**

- (a) Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.
- (b) For operations using DA, the aircraft altimeters are set to QNH. For operations using a barometric DH, the aircraft altimeters are set to QFE.
- (c) For SA CAT I, SA CAT II, CAT II/III operations, the DH is based on the use of a radio altimeter or other devices capable of providing equivalent performance. The DH is determined with

reference to threshold elevation, but the value of the DH set for the approach will be based on the height of the aircraft above the pre-threshold terrain, which may be higher or lower than the threshold.

- (d) For convenience, when both expressions are used, they may be written in the form 'decision altitude/height' and abbreviated 'DA/H'.

## GM35 Annex I Definitions

### MINIMUM DESCENT ALTITUDE (MDA) OR MINIMUM DESCENT HEIGHT (MDH)

- (a) Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 7 ft below the aerodrome elevation. An MDH for a circling approach is referenced to the aerodrome elevation.
- (b) For operations using MDA, the aircraft altimeters are set to QNH. For operations using a barometric MDH, the aircraft altimeters are set to QFE.
- (c) For convenience, when both expressions are used, they may be written in the form 'minimum descent altitude/height' and abbreviated 'MDA/H'.