European Union Aviation Safety Agency

SAFETY MATERIAL

RMT.0379

‘All weather operations.’

SPT.0101

‘Promote the new European provisions on AWO’

AWO IMPLEMENTATION MANUAL

V1.5

According to: ORO.FC, CAT.OP.MPA and SPA.LVO.

together 4safety

In collaboration with

AESA AGENCIA ESTATAL DE SEGURIDAD AÉREA

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Disclaimer: The Agency has prepared this document to provide stakeholders with an easy-to-read publication. This document is part of the safety material documentation published by EASA. The document provides some of the best practices in the industry to implement All weather operations and **does not** form part of the EASA regulatory system (there is no need to comply with this document). This document is for information only. The Agency accepts no liability for damage of any kind resulting from the risks inherent in the use of this document.

1 Legislation and references:

This manual transposed large pieces of information from the Spanish AESA "Guía de transición al cambio normative Reg. (UE) 2021/2237" available in the following link:

English version Edition 1: https://www.seguridadaerea.gob.es/sites/default/files/OPS-REG-ITR01-DT02_Ed_01.Transition_Guide_for_Regulatory_Change_2021_2237_EN.pdf

Spanish version Edition 3: https://www.seguridadaerea.gob.es/sites/default/files/OPS-REG-ITR01-DT02%20Ed%2003%20Gu%C3%ADa%20transici%C3%B3n%20cambio%20normativo%202021_2237.pdf,

Stakeholders are recommended to follow the advice and documentation provided by their regulator.

1.1 Primary legislation and references:

European Regulations:

- Regulation (EU) 2021/2237 amending regulation to Air OPS of 15 December 2021 as regards the requirements for all-weather operations and for flight crew training and checking.
- Regulation (EU) 2021/2227 amending regulation to Air Crew of 14 December 2021 as regards the requirements for all-weather operations and for instrument and type rating training in helicopters.

Consolidated versions

- EASA easy access rules for Air Operations
- EASA easy access rules for certification in All-Weather Operations (CS-AWO) issue 2

1.2 Secondary legislation and references:

- EASA ED Decision 2022/012/R in 'All-weather operations — AMC & GM to air operations rules' of 30 June 2022
    - Explanatory note to ED Decision 2022/012/R
- ED Decision 2022/014/R 'Update of ORO.FC — review of crew training provisions' of 19 August 2022 that includes some small improvements to the AWO and Fuel regulatory packages.
- Regulation (EU) 2021/1296amending and correcting Regulation (EU) No 965/2012 as regards the requirements for fuel/energy planning and management, and as regards requirements on support programmes and psychological assessment of flight crew, as well as testing of psychoactive substances

1.3 For info:

- EASA Opinion No 02/2021 'All-weather operations and review of crew training requirement'
- Terms of Reference (+ Concept Paper).
- IATA.
- ICAO PANS.
- ICAO Doc. 9365 AWO Manual

2 BACKGROUND

The rulemaking task RMT.0379 aimed to make the rules more technology-neutral, i.e. more performance-based. This particularly applies at implementing rule level, whereas specific technical systems may be mentioned at the AMC or GM level. To support the performance-based aerodrome operating minima, EASA introduced the concept of operational credits, e.g. SA CAT I. This rule change closes some gaps with amendments to ICAO provisions and harmonises closely with FAA regulations.

The purpose of this document (EASA AWO Implementation Manual) is to assist states, operators and other stakeholders in implementing the rule changes from Regulation (EU) 2021/2237 and Regulation (EU) 2021/2227. The manual does not introduce requirements or authorize deviations from the rules. The manual provides explanations and examples of ways to implement. It is important to note that the manual is focused on the transition of ongoing operations, i.e. the same category of operations to the same runways as before using aircraft models already operated.

In this context, the manual provides tables, examples, and references between the old regulatory framework (before 30.10.2022) and the new framework (Regulation (EU) 2021/2237). This approach will be maintained through the new versions published during 2023; however, it is planned that from 2024 the manual will slowly decrease the references to the old regulatory framework.

Additionally, all-weather operations also have consequences in the Fuel schemes – Aerodrome selection policy (CAT.OP.MPA.182). Therefore, this manual may indirectly help implement Regulation (EU) 2021/1296 and ED Decision 2022/002/R.

3 CHANGES INTRODUCED ON REGULATION (UE) 2021/2237

3.1 Aerodrome categorisation – ORO.FC.105 & AMC1 ORO.FC.105(b)(2);(c)

Point (b) in AMC1 ORO.FC.105(b)(2);(c) categorised the aerodromes as follows:

3.1.1 Aerodrome CATEGORY A. AMC1 ORO.FC.105(b)(2);(c) point (b)(3)(i)

category A — an aerodrome that meets all the following conditions:

(A) a straight-in 3D instrument approach procedure with a glide path angle of not more than 3.5 degrees to each runway expected to be used for landing;

(B) at least one runway with no performance-limited procedure for take-off and/or landing, such as no requirement to follow a contingency procedure for obstacle clearance in the event of an engine failure on take-off from any runway expected to be used for departure; and

(C) night operations capability.

The contingency procedures for obstacle clearance requirement implies that as long as one runway has no limitation on the engine out contingency procedure for the intended operations, the airport will be categorised as A.

The wording “no performance-limited procedure for take-off” (…) “contingency procedure for obstacle clearance in the event of an engine failure on take-off”. The understanding of the regulator of a performance limited procedure where contingency procedures must be used for obstacle clearance is, for instance, when the aircraft in TOGA requires a complex deviation to avoid obstacles. The regulator understands that there are many reasons to have a deviations in a take-off procedure, for instance, to improve efficiency and allow lower flex temperature/derated thrust, for ATC reasons, alignment with go-around procedures for simplicity reasons…etc.

3.1.2 Aerodrome CATEGORY B. AMC1 ORO.FC.105(b)(2);(c) point (b)(3)(ii)

category B — an aerodrome that does not meet the category A conditions or which requires extra considerations due to:

(A) non-standard approach aids and/or approach patterns, such as restrictions on the availability of straight-in instrument approach procedures;

(B) unusual local weather conditions, such as environmental features that can give rise to turbulence, windshear or unusual wind conditions;

(C) unusual characteristics or performance limitations, such as unusual runway characteristics in length, width, slope, markings or lighting that present an atypical visual perspective on approach;

(D) any other relevant considerations, including obstructions, physical layout, lighting, etc., such as restrictions on circling in certain sectors due to obstacles in the circling area;

(E) training or flight crew experience requirements stipulated by the competent authority responsible for the aerodrome that do not include instruction in an FSTD or visiting the aerodrome.

3.1.3 Aerodrome CATEGORY C. AMC1 ORO.FC.105(b)(2);(c) point (b)(3)(iii)

category C — an aerodrome:

(A) that requires additional considerations to those of a category B aerodrome; or

(B) for which flight crew experience or qualification requirements stipulated by the competent authority responsible for the aerodrome include instruction in an FSTD or visiting the aerodrome.

3.2 Aerodrome Recency – ORO.FC.105

3.2.1 Aerodrome Recency – CATEGORY A.

For Category A aerodromes, the operations manual C and the charts already include the necessary knowledge of obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, applicable operating minima, and ground movements considerations. When the pilot hasn't operated to the Category A aerodrome in more than 12 months, the pilot simply needs to review its operations manual C and the charts during the briefing to the aerodrome as means of initial familiarisations training on the aerodromes, facilities, and procedures to be used.

3.2.2 Aerodrome Recency – CATEGORY B.

When the pilot hasn't operated at the Category B aerodrome during the preceding 12 months, the pilot should complete the briefing/requirements in point (c) of AMC1 ORO.FC.105(b)(2);(c).

3.2.3 Aerodrome Recency – CATEGORY C.

When the pilot hasn't operated at the Category C aerodrome during the preceding 12 months, the pilot should complete the briefing/requirements/visit in point (d) of AMC1 ORO.FC.105(b)(2);(c).

3.2.4 Aerodrome Recency regulatory references refer above.

The new Implementing rule ORO.FC.105 point (c) is amended in Regulation (EU) 2021/2237

ORO.FC.105

(…)

(c) In the case of commercial operations of aeroplanes and helicopters, the pilot-in-command/commander or the pilot to whom the conduct of the flight may be delegated shall have had initial familiarisation training on the route or area to be flown and on the aerodromes, facilities and procedures to be used and shall maintain this knowledge as follows:
(1) The validity of the aerodrome knowledge shall be maintained by operating at least once on the aerodrome within a 12 calendar months' period.
(2) The route or area knowledge shall be maintained by operating at least once to the route or area within a 36 months' period. In addition, refresher training is required regarding route or area knowledge if not operating on a route or area for 12 months within the 36-month period.

(…)

ORO.FC.105 point (c) and AMC1 ORO.FC.105(c) are both aligned:

AMC1 ORO.FC.105(c) Designation as pilot-in-command/commander

ROUTE/AREA AND AERODROME RECENCY

(a) The 12-month period should be counted from the last day of the month:

(1) when the familiarisation training was undertaken; or

(2) when the latest operation on the route or area was flown and when the aerodromes, facilities and procedures were used.

(…)

AMC1 ORO.FC.105(b)(2);(c) Designation as pilot-in-command/commander

GENERAL

The operator should comply with the national training and checking requirements published in the aeronautical information publication (AIP).

ROUTE, AREA AND AERODROME KNOWLEDGE FOR COMMERCIAL OPERATIONS

(…)

(b) Aerodrome knowledge

(1) Aerodrome familiarisation training should include knowledge of obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, applicable operating minima and ground movement considerations.

(2) The operations manual should describe the method of categorisation of aerodromes and, in the case of CAT operations, provide a list of those aerodromes categorised as B or C.

(…)

(c) Prior to operating to a category B aerodrome (planned destination or required alternate), the pilot-in-command/commander should:

(1) comply with any requirements stipulated by the competent authority responsible for the aerodrome; and

(2) be briefed, or self-brief by means of programmed instruction, about the additional considerations applicable to operations to that category B aerodrome. The completion of the briefing should be recorded. This recording may be accomplished after completion or confirmed by the pilot-in-command/commander before departure on a flight involving category B aerodrome(s) as destination or alternate aerodromes.

(d) Prior to operating to a category C aerodrome (planned destination or required alternate), the pilot-in-command/commander should:

(1) comply with any requirements stipulated by the competent authority responsible for the aerodrome; and

(2) be briefed or self-brief by means of programmed instruction, about the additional considerations applicable to operations to that category C aerodrome; and

(3) visit the aerodrome as an observer and/or undertake instruction in a suitable FSTD. The observer should occupy an observer's seat where installed. If an observer's seat is not available and cannot be installed, the pilot-in-command/commander may occupy a pilot seat to conduct the aerodrome visit with a suitably qualified commander nominated by the category C aerodrome operator.

The completion of the briefing, visit and/or instruction should be recorded.

(…)

3.3 All weather operations (AWO)

3.3.1 Summary of approvals for ongoing operations related to Regulation (EU) 2021/2237 – LVO

Kind of Specific Approvals	New naming Y/N	Are the Requirements the same? Y/N	Explanation/Remarks
LVTO 150m	N	Y	There is a new definition of LVO (old rules LTVTO was RVR<400m, in the new rules an RVR 550 or below is an LVTO) but the requirements have no changed.
LVTO 125m	N	Y	No significant differences for approvals to RVR 125 m. "90-meter visual segment" moved to GM
LVTO 75	N	Y	Requires instrument guidance certified in accordance with. CS-AWO issue 2 and for old equipment CS-AWO initial issue.
Special authorisation CAT I SA CAT I: RVR 400m/150 ft.	Y	N	NO grandfathering from LTS CAT I.
Category II operations: CAT II: RVR/DH 300m/100ft	N	Y	No differences in Ops Spec. except that "HUDLS" to touchdown" also qualifies Cat D clarifies for RVR 300 m
Special Authorization Category II Operations SA CAT II: RVR/DH: 350m/100ft	Y, New name: SA CAT II	Y	Replaces OTS CAT II on essentially unchanged conditions. The ILS classification II/D/3 changes to II/D/2 while the max GP-angle becomes 3,2° iso 3,5°. SA CAT has its own col in the tables for downgraded equipment

Category III operations: CAT III: RVR: 175m; DH: 50 ft	Y; New name: CAT III	Y	Previously CAT IIIA with RVR ≥200m. No differences except the naming convention and the fact that with the new provision accepts an RVR of175 m instead of 200 m. It should require changes to the training programme. Fail-passive approach systems are now limited to DH 50 feet or above.
Category III operations: CAT III: RVR: 125m; DH: <50 ft	Y; New name: CAT III	Y	Previously CAT IIIB. No differences except in the naming convention. Note: fail-passive roll-out or equivalent guidance is required.
Category III operations: CAT III: RVR: 75m; No DH.	Y; New name: CAT III	Y	Previously CAT IIIB, No DH. No differences except in the naming convention.
Operational credits: EVS, RVR 350 m Operational credits: EFVS-A: 200ft/RVR 350 m; natural vison according to AFM or otherwise 100 ft.	Y	Y	Previously EVS. No differences except the change of naming to EFVS-A

Note: Grandfathering: The intention is to highlight the operations where Credits for the new approval could be obtained based on the existing approval.

3.4 Annex I - Definitions

Annex I of Regulation (EU) 965/2012 has been modified to eliminate definitions that are no longer applicable, introduce those corresponding to new elements, and modify existing ones to clarify concepts. The most relevant ones are the following:

- New definitions of instrument approach operations (2D, 3D) with their corresponding categories (A and B) as well as those corresponding to the procedures (PA, LPV, NPA) to align it with the ICAO definitions.

- Clarifications are introduced on the CDFA technique, excluding circling approach operations from its scope.

- Likewise, the definitions of new types of operation such as EFVS or EFVS 200 operation are introduced.

- Due to its importance in the new focus of the SPA part, the concept of “operational credit” is introduced.

3.4.1 Specific Explanation about the definition of Circling

(20a) ‘circling approach operation’ means a Type A instrument approach operation to bring an aircraft into position for landing on a runway/final approach and take-off area (FATO) that is not suitably located for a straight-in approach.

3.4.1.1 Preceding instrument approach procedure

The new AMC7 CAT.OP.MPA.110 ‘Circling operations’ in the ED Decision 2022/012/R has deleted the former point (a)(3)(iii) ‘the RVR/CMV derived (…) for the preceding instrument approach procedure’, that means that in the new regulatory environment there is no need to increase the visibility minima to the preceding instrument approach procedure. However, the AMC7 CAT.OP.MPA.110 maintains the provision to increase the DH/MDA to the preceding instrument approach procedure.

Although the situation where the circling visibility minima are lower than the preceding instrument approach procedure is not common, there are a few occasions that could happen (can only happen for Category A or B aircraft and BALS or NALS lighting facility and operations by day. It cannot happen at night see table 16 AMC10 CAT.OP.MPA.110). The recommendation is: to take the preceding instrument approach procedure RVR/CMV into account, although it is not legally required. For example, if the State of the aerodrome has published a minimum RVR or visibility for the preceding instrument approach procedure and such RVR or VIS is higher than the minima derived from table 9 AMC5 CAT.OP.MPA.110, it may be prudent to take the corresponding visibility for the preceding instrument approach procedure into account when determining the circling minima. The same applies when the operator has established a higher minimum for the preceding instrument approach (i.e. above table 9 or the State of the aerodrome). The recommendation above intends to avoid circling approach operations in marginal weather conditions.

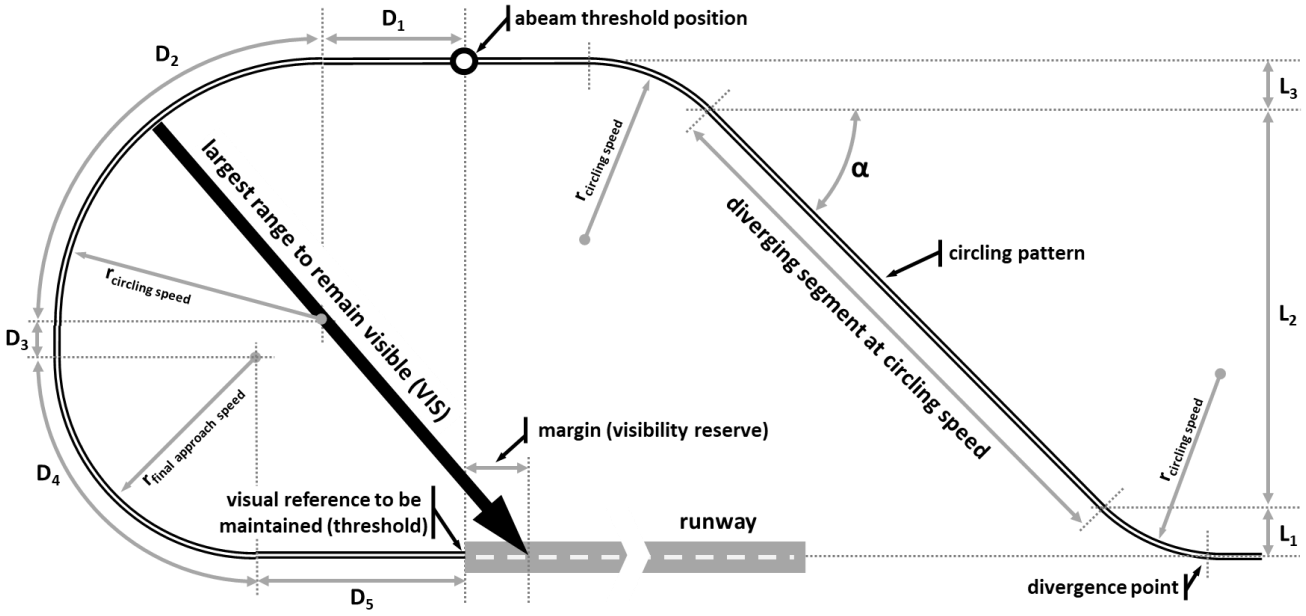
It may be noted that Doc 9635 Manual of All-Weather Operations (Fourth Edition, 2017) Chapter 6.4 paragraph 6.4.8 table 6-2 provides the same values as table 15 of AMC7 CAT.OP.MPA.110.

3.4.1.2 Tabular guidance

The intention of point (b)(4) AMC7 CAT.OP.MPA.110 is that operators should provide guidance for the visibility needed when for example, the circling OCH drives the MDH to higher values than in table 15 or when the operator uses higher values as an standard policy than in table 15. In that case, the main factor to be considered is the distance needed to descend from circling minima to 50 ft above the runway threshold using a normal descent gradient.

Example of parameters in the table to be considered in the context of AMC7 CAT.OP.MPA.110 point (b)(4) based on the assumptions shown in diagram of the circling manoeuvre below.

Determining minimum visibility (aerodrome operating minima) in visual maneuvering operations (circling) for tabular guidance in accordance with point (b)(4) of AMC7 CAT.OP.MPA.110 / GM1 NCC.OP.112 / GM1 SPO.OP.112



Parameter /formula	Parameter and description	CAT A	CAT B	CAT C	CAT D	unit
A	circling height above threshold (corrected for temperature)	400	500	600	700	[ft]
B	aerodrome elevation	0	500	1 000	1 500	[ft]

C	max. Δ ISA - highest temperature deviation above ISA; should cover usual higher temperature range at the aerodrome.	15	15	15	15	[°C]
D	max. VAT (CAS) - for information only: highest VAT of approach category (CAT.OP.MPA.320)	91	120	140	165	[kts]
E	Vcircling (CAS) - visual manoeuvring (circling) speed; specific to the aircraft model	95	125	145	165	[kts]
F	Vfinal approach (CAS) - final approach speed (calibrated airspeed); specific to the aircraft model	85	110	130	145	[kts]
G = E * 171233 * ((288 + C) - 0,00198 * (A + B))^0,5 / (288 - 0,00198 * (A + B))^2,628	Vcircling (TAS) - CAS to TAS conversion; ref. ICAO DOC 8168 Vol. 2, table I-2-1-App-2	98	130	152	175	[kts]
H = F * 171233 * ((288 + C) - 0,00198 * (A + B))^0,5 / (288 - 0,00198 * (A + B))^2,628	Vfinal approach (TAS) - CAS to TAS conversion; ref. ICAO DOC 8168 Vol. 2, table I-2-1-App-2	88	115	137	154	[kts]
I	bank angle during turns - usually in the range of 20° … 25°; consider adequate margin above stall speed; ref. ICAO DOC 8168 Vol. 2 table I-2-3-1	20	20	20	20	[°]
J = 3431 * TAN(I) / (π * G)	Rcircling speed - turn rate at Vcircling (TAS), ref. ICAO DOC 8168 Vol. 2 part I section 2 chapter 3	4.1	3.1	2.6	2.3	[°/s]
K = G / (20 * π * J) * 1852	rcircling speed - turn radius at Vcircling (TAS), ref. ICAO DOC 8168 Vol. 2 part I section 2 chapter 3	712	1 256	1 720	2 268	[m]
L = 3431 * TAN(I) / (π * H)	Rfinal approach speed - turn rate at Vfinal approach (TAS), ref. ICAO DOC 8168 Vol. 2 part I section 2 chapter 3	4.5	3.5	2.9	2.6	[°/s]
M = H / (20 * π * L) * 1852	rfinal approach speed - turn radius at Vfinal approach (TAS), ref. ICAO DOC 8168 Vol. 2 part I section 2 chapter 3	570	972	1 383	1 752	[m]
N	α - diverging segment angle, usual range: 30° … 45°	45	45	45	45	[°]
O	tdiv - diverging segment flight time, usual range: 30 s … 45 s	30	35	40	45	[s]
P = (1 - COS(N)) * K	L1 - lateral offset from runway centre line resulting from turn onto diverging segment at Vcircling	209	368	504	664	[m]
Q = O * G * 1,852 / 3,6 * SINE(N)	L2 - lateral offset from runway centre line of the diverging segment at Vcircling	1 070	1 657	2 216	2 863	[m]
R = (1 - COS(N)) * K	L3 - lateral offset from runway centre line resulting from turn onto downwind segment at Vcircling	209	368	504	664	[m]
S = P + Q + R	L4 - downwind segment lateral offset from runway centre line	1 487	2 392	3 224	4 191	[m]

T = 3 * A / 100	tdownwind, standard - standard procedure downwind segment time past abeam threshold position based on the assumption "3s /100 ft circling height"	12	15	18	21	[s]
U	tdownwind, operator - operator procedure specific downwind time past abeam threshold position	0	5	5	5	[s]
V = U * G * 1,852 / 3,6	D1 - track distance made good of downwind segment past abeam threshold position at Vcircling	0	335	392	450	[m]
W = K * π / 2	D2 - track distance made good along base turn arc (no wind) at Vcircling	1 119	1 972	2 702	3 563	[m]
X = S - K - M	D3 - track distance made good along base segment (straight flight, no wind)	204	164	121	172	[m]
Y = M * π / 2	D4 - track distance made good along final turn arc (no wind) at Vfinal approach	896	1 527	2 172	2 751	[m]
Z = V + K - M	D5 - track distance made good along final approach segment (no wind)	142	618	729	966	[m]
AA = -(A-50) * 0,3048 / (V + W + X + Y + Z)	average gradient for early descent scenario - descent from circling height initiated at abeam threshold position to 50 ft above threshold; value should not exceed the gradient specific for the aircraft model, appropriate limit may be in the range of -5% … -7%.	-4.5%	-3.0%	-2.7%	-2.5%	[%]
BB = -(A-50) * 0,3048 / (X + Y + Z)	average gradient for late descent scenario - descent from circling height initiated after completion of base turn to 50 ft above threshold; value should not exceed the gradient specific for the aircraft model, appropriate limit may be in the range of -5% … -7%.	-8.6%	-5.9%	-5.5%	-5.1%	[%]
CC	margin for flight technical error or visibility reserve (section of the runway beyond threshold to remain visible during base turn); settings based on operator's safety policy, procedures and conditions; may be negative if relevant visual reference is located between runway threshold and circling pattern.	0	100	200	300	[m]
DD = SQRT((S - K)² + (V + CC)²) + K	largest range in the visual manoeuvring pattern along which visual reference needs to be maintained (usually from the outer region of the base turn to the runway threshold); slant range may be neglected.	1 487	2 473	3 336	4 332	[m]
EE	legal minimum visibility - ref. table 15 of AMC7 CAT.OP.MPA.110 / table 1 of NCC.OP.112 or SPO.OP.112	1 500	1 600	2 400	3 600	[m]
FF = maximum of DD (round up to the next hundred digt) and EE	VIS - aerodrome operating minimum; highest of the above (round up to the next higher hundred digit)	1 500	2 500	3 400	4 400	[m]

π : pi =3,141592 CAS: Calibrated air speed.

Green	input value for "height above threshold"; point (b)(4) of AMC7 CAT.OP.MPA.110 / GM1 NCC.OP.112 / GM1 SPO.OP.112
Blue	parameter to reflect operator's procedures, policy and conditions.
Yellow	result for "visibility"; point (b)(4) of AMC7 CAT.OP.MPA.110 / GM1 NCC.OP.112 / GM1 SPO.OP.112

3.4.1.3 Circling Regulatory references refer in points above.

AMC7 CAT.OP.MPA.110 Aerodrome operating minima

CIRCLING OPERATIONS — AEROPLANES

(a) (…)

Table 15

Circling — aeroplanes

MDH and minimum VIS versus aeroplane category

	Aeroplane category			
	A	**B**	**C**	**D**
MDH (ft)	400	500	600	700
Minimum VIS (m)	1 500	1 600	2 400	3 600

(b) Conduct of flight — general:

(1)the MDH and OCH included in the procedure are referenced to aerodrome elevation;

(2)the MDA is referenced to mean sea level;

(3)for these procedures, the applicable visibility is the meteorological visibility VIS; and

(4)operators should provide tabular guidance of the relationship between height above threshold and the in-flight visibility required to obtain and sustain visual contact during the circling manoeuvre.

AMC5 CAT.OP.MPA.110 Aerodrome operating minima

DETERMINATION OF RVR OR VIS FOR INSTRUMENT APPROACH OPERATIONS — AEROPLANES

(a) The RVR or VIS for straight-in instrument approach operations should be not less than the greatest of:

(1) the minimum RVR or VIS for the type of runway used according to Table 8;

(2) the minimum RVR determined according to the MDH or DH and class of lighting facility according to Table 9; or

(3) the minimum RVR according to the visual and non-visual aids and on-board equipment used according to Table 10.

If the value determined in (1) is a VIS, then the result is a minimum VIS. In all other cases, the result is a minimum RVR.

(b) For Category A and B aeroplanes, if the RVR or VIS determined in accordance with (a) is greater than 1 500 m, then 1 500 m should be used.

(c) (…)

(d) (…)

Table 8 **Type of runway versus minimum RVR or VIS — aeroplanes**

Type of runway	Minimum RVR or VIS (m)
PA runway Category I	RVR 550
NPA runway	RVR 750
Non-instrument runway	VIS according to Table 15 (circling minima)

Table 9

RVR versus DH/MDH — aeroplanes

DH or MDH (ft)			Class of lighting facility			
			FALS	IALS	BALS	NALS
			RVR (m)			
200	-	210	550	750	1 000	1 200
211	-	240	550	800	1 000	1 200
241	-	250	550	800	1 000	1 300
251	-	260	600	800	1 100	1 300
261	-	280	600	900	1 100	1 300
281	-	300	650	900	1 200	1 400
301	-	320	700	1 000	1 200	1 400
321	-	340	800	1 100	1 300	1 500
341	-	360	900	1 200	1 400	1 600
361	-	380	1 000	1 300	1 500	1 700
381	-	400	1 100	1 400	1 600	1 800
401	-	420	1 200	1 500	1 700	1 900
421	-	440	1 300	1 600	1 800	2 000
441	-	460	1 400	1 700	1 900	2 100
461	-	480	1 500	1 800	2 000	2 200
481		500	1 500	1 800	2 100	2 300
501	-	520	1 600	1 900	2 100	2 400
521	-	540	1 700	2 000	2 200	2 400
541	-	560	1 800	2 100	2 300	2 400
561	-	580	1 900	2 200	2 400	2 400
581	-	600	2 000	2 300	2 400	2 400
601	-	620	2 100	2 400	2 400	2 400
621	-	640	2 200	2 400	2 400	2 400
641		660	2 300	2 400	2 400	2 400
661	and above		2 400	2 400	2 400	2 400

3.4.1.4 Circling under ICAO Doc.8168 Volume II

According to ICAO Doc.8168 Volumme II:

“5.2.1 The final approach and its track guidance should be aligned with a runway whenever possible (...). When runway aligned track guidance is not possible it may be offset up to 5 degrees without OCA/H penalty (see 5.4.3.1, “Aligned straight-in approach”). Beyond these limits (or where other requirements cannot be met) a circling approach shall be used.”

“5.2.2.3.1 Maximum angle. For a straight-in approach, the angle formed by the final approach track and the runway centre line shall not exceed:

a) 30° for procedures restricted to Cat A and B aircraft ; and

b) 15° for other aircraft categories."

Non-aligned straight-in approach

3.4.1.5 Circling under TERPS standards in an instrument approach procedure

Some countries in the world are not following the ICAO standars in Doc.8168 'Procedures for air navigation services', 'aircraft operations' (PANS-OPS)Volumme II, instead they air following the USA 'terminal instrument procedures' (TERPS). In addition to United states of Americe, other countries following TERPS are: Canada, Korea, Saudi Arabia, etc.

Generally speaking the following can be said when using 'Non-aligned straight-in approach' versus circling: 'for straight-in IAPs (including non-aligned straight-in), US Standard for Terminal Instrument Procedures (TERPS) may be considered to be acceptable as an equivalent to PANS-OPS. If other design criteria than those in PANS-OPS or US TERPS are used, non-aligned straight-in instrument approach procedures above 15 degree should not be used and instead a circling (when available) may be used.

3.4.2 Other definitions outside Reg. (EU) 965/2012 relevant for AWO.

3.4.2.1 Regulation 139/214 Aerodromes regulation.

- 'instrument runway' means one of the following types of runways intended for the operation of aircraft using instrument approach procedures:
  1. 'non-precision approach runway': a runway served by visual aids and at least one non-visual aid, intended for landing operations following a type A instrument approach operation;
  2. 'precision approach runway, category I': a runway served by visual aids and at least one non-visual aid, intended for landing operations following a type B CAT I instrument approach operation;
  3. 'precision approach runway, category II': a runway served by visual aids and at least one non-visual aid, intended for landing operations following a type B CAT II instrument approach operation;
  4. 'precision approach runway, category III': a runway served by visual aids and at least one non-visual aid, intended for landing operations following a type B CAT III instrument approach operation;
- 'non-instrument runway' means a runway intended for the operation of aircraft using visual approach procedures.

3.4.2.2 Certification Specifications for All-weather Operations (CS-AWO) Issue 2

- 'Automatic landing system' (ALS) refers to the airborne equipment, which provides automatic control of the aeroplane during the approach and landing. It includes all the sensors, computers, actuators and power supplies necessary to control the aeroplane to touchdown. It also includes the means to control the aeroplane along the runway during the landing roll-out. In addition, it includes the indications and control necessary for its management and supervision by the pilot. (AMC AWO.A.ALS.101(a) Applicability and terminology)
- An xLS (landing system) is a navigation means (facilities external to the aircraft) that provides to the crew and the aircraft systems deviations from ideal approach and landing lateral and vertical trajectories. The combination of navigation means, crew and aircraft system has been demonstrated to provide the required minimum performance for the intended decision altitude/height (DA/H) or no decision height (DH). If required, the xLS can provide relevant distance information. The xLS can also apply to low-visibility take-offs. (CS AWO.B.CATI.102 Terminology). Previously, landing systems were constrained to instrument landing systems (ILSs); however, the term 'xLS' now includes identified means such as microwave landing system (MLS), ground-based augmented (GBAS) landing system, space-based augmented landing system (SBAS/LPV) or any other system (or combination of systems).

- ‘Fail-passive automatic landing system’: an automatic landing system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition or deviation of the flight path or attitude but the landing is not completed automatically. (AMC AWO.B.CATIII.101(a) point (c)).
- ‘Super fail-passive automatic landing system’: an automatic landing system which meets the requirements of point (c) but has additional features such as automatic align, roll-out and go-around modes which, along with other aircraft characteristics defined under CS AWO.B.CATIII.113(b)(2), permit operations in lower RVRs than less sophisticated fail-passive landing systems (AMC AWO.B.CATIII.101(a) point (e)).
- ‘Fail-operational hybrid landing system’: a system which consists of a primary fail-passive automatic landing system and a secondary independent guidance system enabling the pilot to complete a landing manually following a failure of the primary system.

  A typical secondary independent guidance system consists of a monitored HUD providing guidance which normally takes the form of command information, but it may alternatively be situation (or deviation) information (AMC AWO.B.CATIII.101(a) point (g)).
- ‘Fail-operational automatic landing system’: an automatic landing system is fail-operational if, in the event of a failure, the approach, flare and landing can be completed by the remaining part of the automatic system. In the event of a failure, the automatic landing system will operate as a fail-passive system (AMC AWO.B.CATIII.101(a) point (f)).

3.5 Annex IV – Commercial Air transport operations (Part CAT)

The new requirement CAT.OP.MPA.101 is introduced in relation to the procedures for checking the altimeter before departure and its adjustment in each phase of the flight.

The procedure for establishing aerodrome utilization minima represents one of the main changes for the transition plan—the amendment to the CAT.OP.MPA.110 requirement establishes that the said procedure becomes subject to approval by the Authority. This implies that operators must request the corresponding approval in addition to aligning the procedure with the new AWO regulatory framework. The calculation method of DH and RVR for operations not subject to SPA derived from other points of the regulation are transferred to the AMCs and GMs of this requirement.

Clarifications are introduced in CAT.OP.MPA.115 regarding the criteria for the use of the CDFA technique, particularly in circling approaches, as well as clarifications to the stabilized approach.

Points CAT.OP MPA.265 and CAT.OP.MPA.300 relating to take-off, approach and landing conditions are modified to include the requirements established in CAT.OP.MPA.110 (e) of the old regulation.

CAT.OP.MPA 305 is modified with the approach initiation and continuation criteria to clarify the applicable RVR/VIS (per runway segment or reduced by application of operational credits, for example).

The new concept of operations EFVS 200 (not subject to approval) is introduced through CAT.OP.MPA.312 and its AMCs and GMs. This type of operation is based on the concept of operational credit to allow aircraft equipped with an enhanced flight vision system (EFVS) to apply reduced RVR minima with respect to those that would be applicable according to CAT.OP.MPA.110. The minimum RVR applicable to the EFVS 200 operation will not be, in any case, less than 550 m nor the DH less than 200 ft.

Other normative points of Annex IV are slightly modified in order to introduce the changes in the definitions of Annex I, such as in CAT.OP.MPA.107, CAT.OP.MPA.245, CAT.OP.MPA.246 CAT .OP.MPA.310.

3.5.1 Aerodrome Operating minima CAT.OP.MPA.110

The list of items in the new CAT.OP.MPA.110 applicable from 30.10.2022 has been expanded and, in some cases, changed. The main difference is that the method shall be approved.

The starting point for the method for establishing aerodrome operating minima (AOM) is the standard value/s provided by the Service Providers (SP) which usually covers the majority of aerodrome operating minima; therefore, the operators' method should focused in the deviations (positive or negative) from those standard conditions based on the rules, the Operations Specifications, and circumstances applicable to each case. The method must be based on relevant safety assessment, and described in sufficient detail to be used as guidance for the personnel involved in establishing and applying the AOM.

Note: the SP is expected to explain the method they apply to calculate the aerodrome operating minima and to specify what is not included in their considerations.

The table below offers a description of the process that may be followed.

Items (CAT.OP.MPA.110 (b))	Standard delivery by SP	Action by the Operator	Remarks
(1) the type, performance, and handling characteristics of the aircraft;	Approach category covered	Identification and application of approach category and handling issues affecting AOM if relevant	
(2) the equipment available on the aircraft for the purpose of navigation, acquisition of visual references, and/or control of the flight path during take-off, approach, landing, and the missed approach;	AOM based on minimum equipment required.	Effects of any additional equipment, e.g. auto-pilot, EFVS	
(3) any conditions or limitations stated in the aircraft flight manual (AFM);	Not included	To be identified and applied by the operator.	
(4) the relevant operational experience of the operator;	Not included	Any difference from standard non-LVO conditions to be identified and applied by the operator. Assessment of previous operational data related to runway suitability for LVO.	Normally nothing for non-LVO. Runway suitability is normal part of the operator´s LVO considerations.
(5) the dimensions and characteristics of the runways/final approach and take-off areas (FATOs) that may be selected for use;	Not included	Any difference from standard conditions to be identified and applied by the operator	Normally nothing.
(6) the adequacy and performance of the available visual and non-visual aids and infrastructure;	AOM based on the tables in the OPS rules, e.g. length of approach lights, xLS category, system minima.	Any difference from standard conditions to be identified and applied by the operator	Normally nothing.
(7) the obstacle clearance altitude/height (OCA/H) for the instrument approach procedures (IAPs);	AOM based on IAPs published in AIP	Any difference from standard conditions to be identified and applied by the operator	Normally nothing.
(8) the obstacles in the climb-out areas and necessary clearance margins;	AOM based on compliance with published climb gradients	Verification of ability to comply with published gradients, identification of any measures needed for compliance or establishing visual procedures where visual avoidance of obstacles is needed	Adherence with published gradients is normally achieved by stating the applicable MTOM. Need for visual obstacle avoidance is rather rare.
(9) the composition of the flight crew, their competence and experience;	AOM based on flight crew without any competency restrictions (add-on)	Identification and application of the add-on required by the OPS rules and any additional values	One example is the add-on required for pilots inexperienced on the type.

		that may be imposed by the operator.	
(10) the IAP;	AOM based on IAPs published in AIP including any additional values or conditions that may be published by the State of the Aerodrome	Any difference from standard conditions to be identified and applied by the operator	
(11) the aerodrome characteristics and the available air navigation services (ANS);	AOM based on the published AIP data, e.g. IAC, AD2-text	Assessment of pre-threshold terrain for determination of DH/AH and of LSAA for landing system performance. These may affect the AOM. The form of ATS at the aerodrome, e.g. TWR or AFIS may affect LVO, e.g. LVTO	
(12) any minima that may be promulgated by the State of the aerodrome;	Included in the AOM if published in the AIP (or equivalent)	To be identified and applied by the operator, e.g. for AIP or Ops Spec	
(13) the conditions prescribed in the operations specifications including any specific approvals for low-visibility operations (LVOs) or operations with operational credits.	Standard MDH/DH and RVR provided including DH/RVR for CAT II/III (incl NO DH)	Any non-standard conditions, e.g. AOM based on operational credits (SA CAT I/II, EFVS)	
(14) any non-standard characteristics of the aerodrome, the IAP or the environment	Any non-standard condition stated in the AIP relevant to any operator is expected to be included in the AOM	Any non-standard condition specific to the operator is to be identified and applied by the op0erator if not covered under items (10) and (11)	

3.5.1.1 Regulatory comparison of the Aerodrome Operating minima CAT.OP.MPA.110

The table below explains the background of each requirement in the new CAT.OP.MPA.110 (applicable after 30.10.2022) and compare it to the old CAT.OP.MPA.110 (applicable until 30.10.2022).

NEW CAT.OP.MPA.110	Old CAT.OP.MPA.110	Remark
(b) The method used to establish aerodrome operating minima shall take all the following elements into account:	(c) When establishing aerodrome operating minima, the operator shall take the following into account:	
(1) the type, performance, and handling characteristics of the aircraft;	(1) the type, performance and handling characteristics of the aircraft;	No change
(2) the equipment available on the aircraft for the purpose of navigation, acquisition of visual references, and/or control of the flight path during take-off, approach, landing, and the missed approach;	(5) the equipment available on the aircraft for the purpose of navigation and/or control of the flight path during the take-off, the approach, the flare, the landing, rollout and the missed approach;	“acquisition of visual reference” is added for EFVS. Therefore, ‘no change’ for traditional operations.

(3) any conditions or limitations stated in the aircraft flight manual (AFM);	Regulation (EU) 2018/1139 Annex V point 4.1 4.1 An aircraft must be operated in accordance with its airworthiness documentation and all related operating procedures and limitations as expressed in its approved flight manual or equivalent documentation, as the case may be. The flight manual or equivalent documentation must be available to the crew and kept up to date for each aircraft.	Essential requirements are already required. Therefore it should not be a changed.
(4) the relevant operational experience of the operator;		This point is typically used for new operators or new operations. No change for existing operations.
(5) the dimensions and characteristics of the runways/final approach and take-off areas (FATOs) that may be selected for use;	(3) the dimensions and characteristics of the runways/final approach and take-off areas (FATOs) that may be selected for use;	No change
(6) the adequacy and performance of the available visual and non-visual aids and infrastructure;	(4) the adequacy and performance of the available visual and non-visual ground aids;	No change
(7) the obstacle clearance altitude/height (OCA/H) for the instrument approach procedures (IAPs);	(7) the obstacle clearance altitude/height for the instrument approach procedures;	No change. Note: Missed approach" removed in the old point (6) (new (8)) is included here as IAPs include missed approach.
(8) the obstacles in the climb-out areas and necessary clearance margins;	(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;	New requirement "clearance margins" added; however, if PANS-OPS is followed, it should be NO changed as the clearance margins have not changed in PANS-OPS before and after 30.10.2022.
(9) the composition of the flight crew, their competence and experience;	(2) the composition, competence and experience of the flight crew;	No change
(10) the IAP;	Included in the former AMC4 CAT.OP.MPA.110 criteria for establishing RVR/CMV	The IAP has always been the basis for the aerodrome operating minima.
(11) the aerodrome characteristics and the available air navigation services (ANS);	(8) the means to determine and report meteorological conditions; and	No change

(12) any minima that may be promulgated by the State of the aerodrome;	(a) The operator shall establish aerodrome operating minima for each departure, destination or alternate aerodrome planned to be used. These minima shall not be lower than those established for such aerodromes by the State in which the aerodrome is located, except when specifically approved by that State. Any increment specified by the competent authority shall be added to the minima.	No change
(13) the conditions prescribed in the operations specifications including any specific approvals for low-visibility operations (LVOs) or operations with operational credits.		The conditions prescribed in the OPS SPEC are already required.
(14) any non-standard characteristics of the aerodrome, the IAP or the environment	(c)(…) (9) the flight technique to be used during the final approach.	This item is merely a reminder to give special consideration to special cases when working on items (10) and (11).

3.5.1.2 Temperature correction

EASA only mandates the temperature correction at baro DA/MDA minima.

Important note: the formula for temperature correction provided in ICAO documents (PANS-OPS) should NOT be used as it may contain precision errors. The tables of temperature correction in PANS OPS are correct and are available for use.

The 6th Edition 2018 of the ICAO Doc 8168 PANS OPS Procedures for Air Navigation Services AIRCRAFT OPERATIONS Volume I Flight Procedures Part II FLIGHT PROCEDURE REQUIREMENTS states:

(a) Section I Chapter I General requirements states:

1.7 COLD TEMPERATURE CORRECTION

1.7.1 Temperatures lower than those of the standard atmosphere result in the actual altitude of an aircraft being lower than that indicated by the barometric altimeter. As a consequence, the MOC actually achieved could be lower than the prescribed MOC. In order to prevent this, the pilot shall correct for low temperatures. The pilot is responsible for any necessary cold temperature corrections to all published minimum altitudes/heights in both conventional and PBN procedures. This includes:

a) the altitudes/heights for the initial and intermediate segment(s);
b) the decision altitude/height (DA/H) or minimum descent altitude/height (MDA/H); and
c) subsequent missed approach altitudes/heights.

However, the European AMC3 CAT.OP.MPA.110 Aerodrome operating minima point (c) (see below) only requires correction in the DA/H or MDA/H. The reason for 'not mandating' temperature correction is that safety assessments were discussed during the rulemaking group RMT.0379 reveal that in Europe and for commercial air transport (CAT), the large majority of operations were performed under radar control and radar vectors, while in other aerospace (not under radar vectors) a number of pilots were not correcting altitudes in the initial

and intermediate segments, nor in the subsequent missed approach while others pilots do, creating a lack of separation between those correcting and those not correcting.

Furthermore, other important aerospace authorities in the North American area also have very similar provisions to not mandate and, in some cases, even forbid the use of temperature correction in the initial and intermediate segment (i.e. see snowflake symbol in some airports charts). Thus, it is recommended that Operators review the local provisions, especially when flying to the United States of America (FAA), where there are limitations on the application of temperature correction.

The PANS-ATM states that, except when specifically authorised by the State, ATCOs are not to assign altitudes lower than the minimum flight altitude and are also not to assign flight levels lower than the lowest useable flight level or transition level (as applicable). Further, when vectoring an IFR flight, ATCOs are required to issue clearances such that the aircraft is at or above the minimum vectoring altitude (MVA) applicable to the aircraft's position; it is a requirement that MVAs are corrected for cold temperatures. To facilitate these obligations, the PANS-ATM requires that ATC units provide ATCOs with information regarding minimum flight altitudes, lowest usable flight levels and MVAs, including any correction for cold temperature applied to those levels. The PANS-ATM also requires that ATCOs pass this information to pilots on request to assist pilots-in-command with their responsibility to ensure adequate terrain and obstacle clearance.

The procedures in the PANS-ATM state that on request, ATCOs are to provide pilots of controlled flights information regarding:

a) the minimum flight altitude, lowest usable flight level and/or minimum vectoring altitude applicable to the aircraft's current position and its intended operation; and
b) whether corrections have been applied to those levels by the ATC unit for the effects of cold temperature, and if so, the coldest temperature taken into account.

Section 5 APPROACH PROCEDURES, Chapter 1 subpoint 1.8 VERTICAL PATH CONTROL ON NON-PRECISION APPROACH PROCEDURES

1.8.5 Temperature correction
In all cases, regardless of the flight technique used, a temperature correction shall be applied to all minimum altitudes (see PANS-OPS, Volume III, Section2, Chapter 4, 4.3, "Temperature correction")

(b) Section 5, Chapter 5 Final approach Point 5.4 APV APPROACH PROCEDURES subpoint 5.4.3 APV/BARO-VNAV approach procedures

5.4.3.7 Temperature constraints

5.4.3.7.1 The pilot shall be responsible for any necessary cold temperature corrections to all published minimum altitudes/heights. This includes:
a) the altitudes/heights for the initial and intermediate segment(s);
b) the DA/H or MDA/H; and
c) subsequent missed approach altitudes/heights.
5.4.3.7.2 Only the FAS VPA of the APV baro-VNAV procedure is safeguarded against the effects of low temperature by the design of the procedure. The minimum temperature on the chart relates to a minimum VPA of 2.5°, and the maximum temperature on the chart relates to a maximum VPA of 3.5°.
5.4.3.7.3 Baro-VNAV procedures are not permitted when the aerodrome temperature is below the promulgated minimum aerodrome temperature for the procedure, unless the flight management system (FMS) is equipped with approved automated cold temperature compensation for the final approach.
5.4.3.7.4 The charted temperature range applies to the LNAV/VNAV minima only and does not apply to other minima.
5.4.3.7.5 For aircraft with approved automated cold temperature compensation FMS systems, the promulgated minimum temperature can be disregarded provided the actual temperature is within the limits of the aircraft certification.
5.4.3.7.6 Below the equipment certified limiting temperature, an LNAV procedure may still be used provided that such a procedure is promulgated for the approach and the appropriate cold temperature altimeter correction is applied to all minimum promulgated altitudes/heights by the pilot.
5.4.3.7.7 Procedure temperature restrictions do not apply when SBAS is used to fly LNAV/VNAV procedures.

In EASA, for LNAV/VNAV using baro VNAV minima it is forbiden the temperature correction on the final approach fix (FAF) when the temperature is within the design limits, even if that is below 0°C in accordance with AMC2 CAT.OP.MPA.126 'Performance-based navigation' point (d)(2) '*Temperature compensation'* paragraph (i)(B) *'when the temperature is within promulgated limits, the flight crew should not make compensation to the altitude at the FAF'*. When outside the range, the operator may allow flight crews to revert to an LNAV approach (2D) with LNAV minima and therefore, temperature correction of those LNAV minima should be performed in accordance with AMC3 CAT.OP.MPA.110 point (c). Note that at the design level, Baro VNAV (LNAV/VNAV) is not safeguarded against the effects of low temperature in the intermediate or initial approach segments. In this regard the EASA regulatory framework does NOT mandate the use of temperature correction nor forbids its use in the intermediate or initial segments. It is, therefore, the operator on the basis of the minimum obstacle clearance (MOC) of a particular approach and of the particular segment that should evaluate the application of temperature correction.

The 1st Edition 2018 of Doc 8168 PANS OPS Procedures for Air Navigation Services AIRCRAFT OPERATIONS Volume III Aircraft Operating Procedures states:

(a) Section 2 Altimeter setting procedures Chapter 4. Altimeter corrections

4.3 TEMPERATURE CORRECTION

4.3.1 Requirement for temperature correction

The calculated minimum safe altitudes/heights must be adjusted when the ambient temperature on the surface is much lower than that predicted by the standard atmosphere. In such conditions, an approximate correction is 4 per cent height increase for every 10°C below standard temperature as measured at the altimeter setting source. This is safe for all altimeter setting source altitudes for temperatures above –15°C.

4.3.2 Tabulated corrections

For colder temperatures, a more accurate correction should be obtained from Tables 2-4-1 a) and 2-4-1 b). These tables are calculated for a sea level aerodrome. They are therefore conservative when applied at higher aerodromes. To calculate the corrections for specific aerodromes or altimeter setting sources above sea level, or for values not tabulated, see 4.3.3, "Corrections for specific conditions".

Note 1.— The corrections have been rounded up to the next 5 m or 10 ft increment.

Note 2.— Temperature values from the reporting station (normally the aerodrome) nearest to the position of the aircraft should be used.

(..)

4.3.6 Small corrections

For practical operational use, it is appropriate to apply a temperature correction when the value of the correction exceeds 20 per cent of the associated minimum obstacle clearance (MOC).

AMC3 CAT.OP.MPA.110 Aerodrome operating minima

DETERMINATION OF DH/MDH FOR INSTRUMENT APPROACH OPERATIONS — AEROPLANES

(...)

(c) Where a barometric DA/H or MDA/H is used, this should be adjusted where the ambient temperature is significantly below international standard atmosphere (ISA). GM8 CAT.OP.MPA.110 'Low temperature correction' provides a cold temperature correction table for adjustment of minimum promulgated heights/altitudes.

GM8 CAT.OP.MPA.110 Aerodrome operating minima

LOW TEMPERATURE CORRECTION

(a) An operator may determine the aerodrome temperature below which a correction should be applied to the DA/H.

(b) Table 20 may be used to determine the correction that should be applied.

(c) The calculations in the table are for a sea-level aerodrome; they are therefore conservative when applied at higher-level aerodromes.

(d) Guidance on accurate corrections for specific conditions (if required) is available in PANS-OPS, Volume I (ICAO Doc 8168) Section 1 Chapter 4.

See table 20 in the Air OPS regulation.

3.5.2 Approach ban – CAT.OP.MPA.305 and related AMC&GM.

1- The approach ban is located at 1.000 feet. Except for DA/H/MDA/H above 1.000 feet, in such case, it is located in the final approach fix (FAP).
2- The RVR that determines the approach ban is called “controlling RVR”.
3- The controlling RVR should be the ‘touchdown RVR’. The value should be sufficient to allow pilots to see enough to land the aircraft.
4- If ‘touchdown RVR’ is not available, then MID RVR should be the controlling RVR.
5- Additional RVR information (e.g., midpoint and stop end) are advisory and they should allow the pilot to determine if sufficient visual reference exist to control the aircraft during roll-out and taxi.
6- However, for aircraft manually controlled during ‘roll-out’ EASA recommends the following RVR for the MID and/or END:

Minimum RVR	Facilities
300 m (day)	Centre line markings; and Runway edge lights.
300 m (night)	Centre line markings; and Runway edge lights; and Runway end lights or centre line lights.
150 m	Centre line markings; and Runway end lights; and Runway edge lights; and Runway centre line lights.
125 m	Centre line markings; and Runway end lights; and Runway edge lights (spaced 60 m or less); and Runway centre line lights (spaced 15 m or less).
Information transposed from Table 1 AMC1 SPA.LVO.100(a)	

Note: the minimum value of the MID RVR should allow pilots to keep the aircraft straight on the runway after touchdown in a highspeed condition. That is the reason why EASA recommends for aircraft manually controlled to use the Table 1 AMC1 SPA.LVO.100(a) ‘low-visibility take-off (LVTO) operations — aeroplanes in an RVR of less than 400 m’ because the necessary skills to control the aircraft in a high speed conditions of landing should be similar to those in take-off , therefore it should be RVR 125m for a runway capable of supporting Low visibility operations. For helicopter operations table 3 in AMC 2 SPA.LVO.100(a) ‘LVTO operations — helicopters’ should be applicable:

RVR or VIS (m) *	Facilities
Not less than 250 m or the rejected take-off distance, whichever is the greater	No light and no markings (day only)
Not less than 800 m	No markings (night)
Not less than 200 m	Runway edge/FATO light and centre line marking

RVR or VIS (m) *	Facilities
Not less than 150 m	Runway edge/FATO light, centre line marking and relevant RVR information
Information transposed from Table 3 'LVTO operations with helicopters — RVR versus facilities onshore' of AMC2 SPA.LVO.100 (a).	

Note 2: the minimum value of the 'STOP END RVR' should be sufficient to allow pilots to find the turn-off out of the runway and taxi to the terminal.

3.6 Annex V – Specific approvals (Part SPA)

General changes are made to the requirements for LVO approvals.

Since the definition of low visibility operations extends to all those below an RVR of 550 m, the LVTO concept of operations extends to all takeoffs with an RVR of less than 550 m. However, they will only require specific approval for those LVTOs with an RVR of less than 400 m.

The operations of LTS CAT I, OTS CAT II, and EVS approaches disappear. The operational attributions of these SPAs become contemplated within the framework of the operational credits.

The denomination of CAT IIIA and CAT IIIB are deleted. The new regulatory framework simply refers to CAT III operations.

The concept of "operational credits" is introduced, which allows the application of reduced minimums to those aircraft that have equipment that is additional to that required as standard in relation to a given operation. In particular, the following operational credits are introduced:

- SA CAT I is an operational credit applied to a CAT I operation that allows the instrument segment of a CAT I approach to be extended to a minimum DH of 150 ft.
- HELI SA CAT is an operational credit applied to a CAT I operation for helicopters that allows the instrument segment of a CAT I approach to be extended to a minimum DH of 130 ft.
- SA CAT II is an operational credit that applies to a CAT II operation. It allows operating on a runway without the lighting requirements of a CAT II approach. It does not imply lower DHs than those in a standard CAT II approach.
- EFVS Operations allows reductions of RVR in the visual segment (not DH) under certain conditions for aircraft equipped with an Enhanced Flight Vision System (EFVS).

The AMCs in point SPA.LVO.105 include the necessary criteria for the corresponding specific approval, such as operational procedures, equipment certification, etc., from points that disappear in the new regulation, such as SPA.LVO.125 and SPA.LVO.130. A requirement that disappears from SPA.LVO.105 is the need for operational checks for each runway/aircraft type pair before starting CAT II or III operations established by the old AMC6 SPA.LVO.105, which is eliminated with the new normative change.

Point SPA.LVO.110 and its AMCs establish the requirements related to the necessary aerodrome infrastructure and navigation services whose adequacy for the corresponding LVO operation.

In addition to the SPA LVO, the following changes are introduced in the SPA part:

- In the specific approval SPA.NVIS new AMCs are introduced to allow the use of NVIS devices during IFR operations.

- In HOFO (specific approval), the destination alternate aerodrome requirements are modified. SPA.HOFO.125 introduces a more general concept of standard approach procedures at sea (OSAP).

- A new specific approval is created for helicopter approaches and departures to a point in space with reduced VFR minima (SPA.PINS-VFR) that allows the use, under certain conditions, of reduced VFR minima in the visual segment after a PinS approach, as well as before an IFR transition.

3.6.1 **LVTO**

The new AMC1 SPA.LVO.100(a) 'LVTO operations — aeroplanes in an RVR of less than 400 m' point (a) to (d) transposes the requirements for LVTO down to 125 m from the old AMC1 SPA.LVO.110 and incorporates the requirements for LVTO in multi-engine aeroplanes without the performance to stop or continue a take-off in the event of an engine failure. These have been transposed from AMC1 CAT.OP.MPA.110, as a specific approval. The requirement for a 90 m visual segment is moved to GM2 SPA.LVO.100(a) because this is the intention of requiring an RVR of 125 m, the 90 m visual segment should not be considered an additional requirement.

The new AMC1 SPA.LVO.100(a) point (e) to (h) 'LVTO operations — aeroplanes in an RVR of less than 125 m' transposes the requirements for LVTO in an RVR of less than 125 m but also allows for the situation where equipment is certified for take-off in lower values of RVR than 125 m. This is to facilitate the future implementation of new technologies that could have different capabilities. Note that SPA.LVO.105 and AMC1 SPA.LVO.105(a) details the equipment currently required for LVTO below 125 m.

The new AMC1 SPA.LVO.105(a): 'Equipment certification' details the equipment requirements for certain types of LVOs and operations with operational credits. The requirements have been transposed from the existing rules with the following differences:

— For LVTO in an RVR of lower than 125 m, a certified system for such purpose is mandated. GM1 provides information about the types of systems that could be certificated for such purposes.

The new GM1 SPA.LVO.100(a) 'Classification of low-visibility take-off operations' clarifies that not all Low Visibility Take Offs (LVTOs) require specific approval. Only low visibility take-off operations below an RVR of 400 m required specific approval.

Low Visibility take off (LVTO) in accordance with Regulation (EU) 2021/2236 (**AEROPLANES**)	
RVR	Comments
550 m * see note below	Take-off below 550 m RVR is considered a Low visibility operation in Europe. However, in 3rd countries, this situation may not be the same; therefore, EASA operators can perform an LVTO without LVPs in force as per AMC2 SPA.LVO.105(c) point (b)(7), in Europe and in 3rd countries and only for LVTO between 400 m to 550 m. More information in GM1 SPA.LVO.100(a). The airline operator does not require prior approval for such an operation. Note aerodromes under EU Regulation No 139/2014 should have implemented LVPs to accommodate low visibility operations and the information is published in the AIP (ADR.OPS.B.045). This in line with ICAO PANS ATM Chapter 7.13.2.1 which also requires that the aerodrome develops LVPs for operations below 550 meters, including LVTOs. In Europe when the aerodrome has not developed LVPs the aerodromes may stop operations on the basis of Reg (EU) 1139/2018 Annex VII 'Essential requirements for ADR', point (6.) OTHERS *'Without prejudice to the responsibilities of the aircraft operator, the aerodrome operator shall ensure that, except for aircraft emergency situations, when diverting to an alternate aerodrome, or under other conditions specified in each case, an aerodrome or parts*

	thereof shall not be used by aircraft for which the aerodrome design and operating procedures are not normally intended.'
400 m	Low visibility take-off below 400 m RVR required prior approval. The operator should refer to Part SPA subpart SPA.LVO and seek specific approval before operations below 400m. Prior to commencing an LVTO below 400 m, the pilot-in-command/commander should be satisfied that LVPs are in effect. (AMC1 SPA.LVO.105(c) point (b)). Initial training for LVTO in an RVR of less than 400 m is covered by AMC1 SPA.LVO.120(b). Such training includes: (a) a ground training and (b) FSTD or flight training. Recurrent checking for LVTO is contained in AMC4 SPA.LVO.120(b): (a) One or more rejected take-offs once a year. Difference training for LVTO is contained in AMC5 SPA.LVO.120(b)
300 m	The following runway facilities are required: (a) By day: Centre line markings; and Runway edge lights. (b) By night: Centre line markings; and Runway edge lights; and Runway end lights or centre line lights.
Less than 150 m	The following runways facilities are required: Centre line markings; and Runway end lights; and Runway edge lights; and Runway centre line lights. Initial training for LVTO in an RVR of less than 400 m is covered by AMC1 SPA.LVO.120(b). In addition: (a) the training should be conducted in an FSTD (no aircraft training is allowed) (b) Checking is required as follows: – One LVTO in minimum approved RVR – One rejected take-off at minimum RVR Recurrent checking for LVTO, is contained in AMC4 SPA.LVO.120(b): (a) One or more LVTO every OPC (six months) or (b) for ATQP once every OPC or LOE (one year) (c) for EBT at frequency B (one cycle) or for non-commercial once every periodic demonstration of competence (one year).
Less than 125 m	The following runway facilities are required: Centre line markings; and Runway end lights; and Runway edge lights (spaced 60 m or less); and Runway centre line lights (spaced 15 m or less). Aircraft used for LVTO in an RVR of less than 125 m should be equipped with a system certified for the purpose. A minimum of 10 take-offs using the specific procedures established for LVTOs in less than 125m.
75 m	Aircraft used for LVTO in an RVR of 75 m should be equipped with a system certified for the purpose.
Compliance table of LVTO between 550 meters and 400 meters with Annex V Part-SPA. Article 5 Regulation (EU) 965/2012 states the following: "2. Operators shall comply with the relevant provisions of Annex V when operating: (...) (iv) low-visibility operations (LVOs) or operations with operational credits;(...)"	

At the same time SPA.LVO.100 states the following:
”The operator shall conduct the following operations only if they are approved by the competent Authority:
(a) take-off operations with visibility conditions of less than 400 m RVR;(...)”.

Therefore, LVTO between 550m and 400 m must comply with Part SPA, but it does not require specific approval.

Compliance with Part-SPA is as follows:

SPA.LVO.100: as detailed above, no approval is required for LVTO between 550m and 400m.
AMC1 SPA.LVO.100 (a): the AMC applies to LVTO below 400 m.

SPA.LVO.105 ”Specific approval criteria” and related AMCs are not applicable because they are related to the specific approval, and LVTO between 550m&400m does not require approval.

SPA.LVO.110 and AMC1 SPA.LVO.110. Point (a)(2) states the following: ’suitable aerodrome operating procedures, including LVPs, and the compatibility with the intended aircraft operations; (...)’, however, point AMC2 SPA.LVO.105(c) point (b)(7) states the following: ’(7)(...) LVPs are required:
(...)(ii)for LVTOs with RVR less than 400 m.’ Therefore, to keep coherence between AMCs, no LVPs are required for LVTOs with RVR at or above 400 m. The rest of the points in SPA.LVO.110 are related to low visibility approach and landing operations.

SPA.LVO.120. Compliance with AMC1 SPA.LVO.120(a) is required by establishing mitigation measures for the operation of LVTO for new pilots on type or class or new pilots in command.
AMC1 SPA.LVO.120(b) is applicable for LVTO below 400m; therefore is not required for LVTO between 550m & 400m.

3.6.1.1 RVR Reporting point in LVTO

Point (c) of AMC1 SPA.LVO.100(a) clarifies that the specified RVR is required for the reporting points on the segments of the runway that will be used for the take-off roll or in the event of a rejected take-off. The reporting points necessary for the take-off are determined by the commander for each take-off. The intent of the requirement is not changed. The operator expects that the service provider (i.e. chart provider) provides the take-off minima value based on the runway facilities. Then, the commander/operator, based on the actual conditions of the day of operations, will determine the minimum RVR and the RVR reporting point that are necessary for the operation (e.g. how a downgraded equipment affects the minimum RVR, performance of the aircraft to complete ASD in less runway …etc).

Note: as discuss above, the minimum RVR at the initial reporting point (125 meters) can be replace by a pilot 90m visual segment.

3.6.2 CAT II

The new AMC1 SPA.LVO.100(b) ‘CAT II operations’ transpose the requirements for CAT II operations from the existing AMC4 SPA.LVO.100 but removes the criteria for other-than-standard category II (OTS CAT II) operations (operations with operational credits are dealt with in separate AMC, see AMC2 SPA.LVO.100(c) for the requirements for SA CAT II). The equipment requirements and operating procedures have been moved to SPA.LVO.105 and the aerodrome requirements to SPA.LVO.110.

The requirement for the DH to be not lower than ‘the minimum height to which the precision approach (PA) aid can be used without the specified visual reference’ is removed as this is a duplication of the minimum DH for the approach category.

3.6.3 CAT III

The new AMC2 SPA.LVO.100(b) 'CAT III operations' transposes the requirements for CAT III operations from the existing AMC5 SPA.LVO.100. The equipment requirements and operating procedures have been moved to SPA.LVO.105 and the aerodrome requirements to SPA.LVO.110.

The subdivisions of category III have been removed. The lowest DH values to be used for particular aircraft installations will be described in the AFM. The reference to the type of roll-out systems used is included to allow the determination of the appropriate RVR value based on the pilot's need to be able to control the roll-out (the certification requirements are described in CS-AWO). GM2 SPA.LVO.100(b) offers additional information about which systems are required for certain DHs.

The lowest RVR for a DH between 50 and 100 ft (previously CAT IIIA) will be 175 m (previously 200 m) to be aligned with the new ICAO standard for CAT IIIA. The provision for an RVR of 150 m for aircraft certificated as 'super fail-passive' is removed. 175 m will now be required for DHs down to 50 ft. It is understood that this provision was applicable to a single aircraft type that is no longer in production.

As the equipment of super fail-passive has been demonstrated as suitable for use down to 150 m, operators with such aircraft could consider applying for an AltMoC.

The minimum RVR for DH below 50 is 125 m in the current rules, based on a fail-passive roll-out system; this has been retained but based on input from an aircraft manufacturer, a provision has been inserted to allow a minimum RVR of 75 m where this has been demonstrated during the equipment certification process.

The new ICAO (Annex 6) definition: Category III (Cat III): a decision height lower than 30 m (100 ft) or no decision height and an RVR less than 300 m or no RVR limitation; AWO Manual will talk about fail-passive and fail-operational CAT III and the associated values similar to the European rules.

3.6.3.1 Table 5 of AMC2 SPA.LVO.100(b)

The background for table 5 AMC2 SPA.LVO.100(b) is that the airworthiness certification does not specify RVR minima as a limitation in the AFM. Instead, the RVR minima are subject to OPS rules. The RVR values encountered during airworthiness certification are included to assist in establishing the calculation of the aerodrome operating minima. The RVR is very much related to the ability to control the aircraft along the runway, and consequently, the availability and capability of roll-out control or guidance system is essential in establishing the minimum RVR for CAT III operations.

AMC2 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

INSTRUMENT APPROACH OPERATIONS IN LOW-VISIBILITY CONDITIONS — CAT III OPERATIONS

For CAT III operations, the following should apply:

(a) For operations in which a DH is used, the DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance and be not lower than:

(1) the minimum DH specified in the AFM, if stated;

(2) the DH to which the flight crew is qualified to operate.

(b)Operations with no DH should only be conducted if:

(1) operation with no DH is specified in the AFM;

(2) there is no published information indicating that the approach aid or aerodrome facilities cannot support operations with no DH; and

(3) the flight crew is qualified to operate with no DH.

(c) The lowest RVR to be used~~.~~ should be determined in accordance with Table 5:

***Table 5* - CAT III operation minima: RVR (m) versus DH (ft)**

DH (ft)	Ground roll-out control/guidance system	RVR (m)*
50-99	Not required	175
0-49 or no DH	Fail-passive	125
	Fail-operational	75

3.6.3.2 Certified DH for fail-passive vs fail-operational landing.

There is no need to include information in the OPS SPEC about the capability of the landing systems (automatic, HUDLS, fail-passive or fail-operational) since the airworthiness certification fully covers this (CS-AWO), where the DH will depend on whether the landing systems are fail-passive (DH ≥50 ft) or fail-operational (DH < 50 ft or No DH). Our examples for Operations Specifications in the Implementation Manual are fully in line with this, and they are similar to what FAA does. Additionally, both CS-AWO Issue 2 (2022) and Issue 1 (2003) contain the same requirements in this respect. Both Airbus and Boeing have informed that their aeroplanes approved for CAT III with DH <50 ft have fail-operational landing systems.

Examples of FAA OpSpec

Airplane M/M/S	Approach/Landing System*	Rollout System*	DH/AH	TDZ/Mid/RO RVR	Special Operational Equipment and Limitations
B-737-8	FP Autoland	None	50 DH	600/600/300	N/A
B-737-800	FP Autoland	None	50 DH	600/600/300	N/A

Airplane M/M/S	Approach/Landing System*	Rollout System*	DH/AH	TDZ/Mid/RO RVR	Special Operational Equipment and Limitations
A-319-131	FO Autoland	FO	100 AH	300/300/300	N/A

It should be noted that FAA normally does not specify DH less than 50 ft, so the second example is a No DH approval. There is no ICAO requirement to include AH I in the Operations Specifications, and in the EU it is contained in the airworthiness certification documents.

3.6.3.3 Certification criteria for fail-passive vs fail-operational landing.

According to CS AWO.B.CATIII.123 Fail-operational landing system (automatic or hybrid) point (a) 'the probability of total loss of the landing system below the alert height shall be extremely remote' and point (b) ' fail-operational landing system shall operate as a fail-passive system following the first failure, which leads to a loss of the fail-operational capability'

In the other hand, CS AWO.B.CATIII.122 Fail-passive automatic landing system (including super fail-passive system) point (a) 'failure conditions resulting in the loss of automatic landing control capability below the DH shall not occur more frequently than once every thousand approaches' and point (b) 'any failure condition, which is not extremely remote, shall be detected and neutralised before it has a significant effect on the trim, flight path or attitude'.

According to AMC AWO.B.CATIII.101(a) Applicability and terminology:

Point (d) For a fail-passive automatic landing system, the pilot assumes control of the aircraft following a failure. The following are typical arrangements:

(1) A monitored automatic pilot in which automatic monitors will provide the necessary failure detection and protection.

(2) Two automatic pilots with automatic comparison to provide the necessary failure detection and protection.

Point (f) 'Fail-operational automatic landing system': an automatic landing system is fail-operational if, in the event of a failure, the approach, flare and landing can be completed by the remaining part of the automatic system. In the event of a failure, the automatic landing system will operate as a fail-passive system. The following are typical arrangements:

(1) Two monitored automatic pilots, one remaining operative following a failure.

(2) Three automatic pilots, two remaining operative (to permit comparison and provide necessary failure detection and protection) following a failure.

3.6.3.4 Fail-passive vs fail-operational landing and Instrument approach operations with a DH 50 ft or greater, below 50 ft and NO DH.

The following guidance provides explanation on the reasoning behind Table 5 AMC2 SPA.LVO.100(b) and other provisions in Part SPA. For the purpose of the explanation the super fail-passive system is excluded (this equipment require an AltMoC) and the explanation will only consider fail-passive and fail operational landing.

According to CS-AWO issue 2, CS AWO.B.CATIII.113 Installed equipment:

(a) For instrument approach procedures (IAP) with a DH of 15 m (50 ft) or greater the require equipment is (see point (b) of CS AWO.B.CATIII.113):

(i) Fail-passive automatic landing system or HUDLS;
(ii) Automatic speed control, unless it can be shown that speed control does not add excessively to the flight crew workload;
(iii) Automatic or flight director go-around or suitable attitude indicators

(b) For IAP with a DH below 15 m (50 ft) the require equipment is (see point (c) of CS AWO.B.CATIII.113):

(1) Fail-operational automatic landing system or fail-operational hybrid landing system;
(2) Fail-passive automatic go-around;
(3) Automatic speed control; and
(4) Fail-operational or fail-passive automatic ground-roll control or head-up ground-roll guidance (see CS AWO.B.CATIII.105).

(c) For IAP with NO DH the require equipment is (see point (d) of CS AWO.B.CATIII.113):

(1) Fail-operational automatic landing system;
(2) Fail-passive automatic go-around;
(3) Automatic speed control; and
(4) Fail-operational or fail-passive automatic ground-roll control or head-up ground-roll guidance (see CS AWO.B.CATIII.105).

Thus, table 5 can be completed as follows:

DH (ft)	Automatic landing system	Go-around	Ground roll-out control/guidance system	RVR (m)*
50-99	Fail-passive automatic landing or HUDLS(1)	Automatic go-around or flight directors	Not required(2)	175
0-49 or no DH	Fail-operational automatic landing system or fail-operational hybrid landing system(3)	Fail passive	Fail-passive	125
	Fail-operational automatic landing system(3)	Fail passive	Fail-operational(4)	75

* Note: For a fail-passive or HUD roll-out control system, a lower RVR value (no lower than 75 m) can be used if stated in the AFM provided that the equipment demonstrated such capability as part of the certification process. This is provided that the operator has implemented the appropriate operating procedures and training. The intend of this provision in the regulation is to allow future automatic landing systems without ground roll guidance/control system but equipped with other technologies such a combine system with EFVS (to benefit from a visual advantage).

1-CS-AWO issue 2 AMC AWO.B.CATIII.101(a) Characteristics of the types of operation point (a) 'DH below 30 m (100ft) but not less than 15 m (50 ft)' states: 'in order to achieve the desired success rate and to preserve the safety level, it has been considered necessary that the aeroplane be fitted with an automatic landing system[1] or a head-up landing guidance system'

2-CS AWO.B.CATIII.105 Control of flight path and ground roll point (a)(1). For fail passive automatic landing, the primary mode of controlling the aeroplane shall be automatic until the main wheels touch the ground.

3-CS-AWO issue 2 AMC AWO.B.CATIII.101(a) 'Characteristics of the types of operation' point (b) 'DH below 15 m (50 ft)' states 'Aeroplanes which have a fail-operational landing system[2]'

4-CS AWO.B.CATIII.105 Control of flight path and ground roll point (a)(2). For DHs below 15 m (50 ft), a fail-operational landing system (automatic or hybrid) shall be provided which, when appropriate, includes provision for the control of the aeroplane along the runway during the ground roll down to a safe speed for taxiing.

3.6.4 **EFVS**

The new AMC3 SPA.LVO.100(c) 'Operational credit: EFVS operations' allows approach EFVS operations, including in low-visibility conditions (RVR less than 550 m), and landing EFVS operations considering them operations with operational credits. Such operations will require the operator to hold specific approval from the competent authority. ICAO standards require specific approval for operations with operational credits. This requirement is in Part-SPA. The term 'EFVS' is introduced to describe a system that can be used for operational credits as opposed to 'EVS', which refers to a system used only for improved situational awareness (see definitions in Annex I).

NOTE: There is an option to allow EFVS operations without specific approval where the equipment is not used below 200 ft and where the RVR is not less than 550 m; see CAT.OP.MPA.312 and NCC.OP.235.

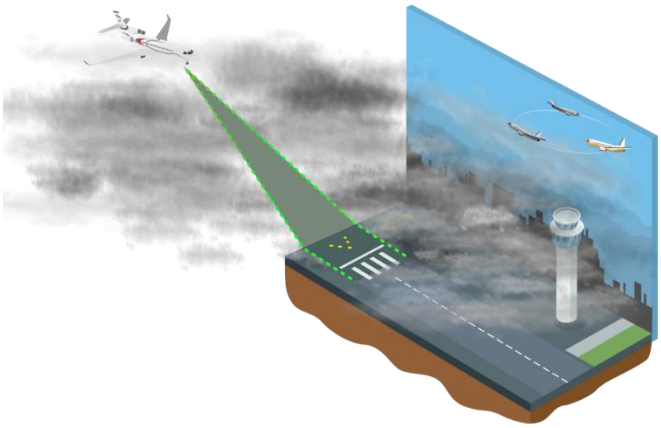
CS-AWO issue 2 allows equipment manufacturers to specify the performance of a particular EFVS in different weather conditions. This information will be presented in the AFM, usually in the form of a table of visibility credits for different weather conditions. In order to allow operators to take advantage of EFVS, this AMC allows the RVR to be determined in accordance with the demonstrated performance as shown in the AFM. For 'legacy'

[1] See the definition of automatic landing system (ALS) in chapter 3.4 Annex I Definitions, Other definitions outside Reg (EU) 965/2012 relevant for AWO

[2] See the definition in chapter 3.4 Annex I Definitions, Other definitions outside Reg (EU) 965/2012 relevant for AWO and more explanations in

systems and other systems where the AFM does not include such information, the new Table 8 has been transposed from Table 6 in the existing AMC6 SPA.LVO.100.

If EFVS operations are to be conducted in visibilities of less than 550 m, then such operations would be LVOs. Point (c) AMC3 SPA.LVO.100(c) ensures that LVOs are conducted only if LVPs are established at the aerodrome of intended landing.



Use of EFVS in a Non-precision approach: the regulatory framework allows the use of EFVS (approach (EFVS-A) or landing (EFVS-L) in a non-precision approach. The EFVS equipment has an offset limitation (usually about 3 degrees to 5 degrees) that must be observed. Therefore, NPA with offset above the EFVS maximum certified offset limitation should not be flown; thus, NPA should be flown traditionally, and NO operational credits can be obtained.

3.6.4.1 Aircraft flight manual (AFM) and table 10 of AMC3 SPA.LVO.100(c)

The new European AWO regulatory system follows the principle that EFVS should be certified and the performance assessed; therefore, the RVR minima should be determined in accordance with the AFM for the expected weather conditions. CS-AWO issue 2 has established this principle for that purpose, and the equipment certified after March 2022 must provide this information. However, there are a number of equipment certified prior to March 2022 (in accordance with CS-AWO issue 1), and criteria to determine RVR are not specified. AMC3 SPA.LVO.100 (c) table 10 provides the traditional 1/3 approach for the determination of the RVR.

Note: In the new CS-AWO issue 2 published in 2022, the minimum visibility currently certified is RVR 300[3] meters; therefore, the RVR minima in point (b)(1) of AMC3 SPA.LVO.100(c) may be 300 meters or above.

AMC3 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS — EFVS OPERATIONS TO A RUNWAY

When conducting EFVS operations to a runway:

(a) (…)

(b) the lowest RVR minima to be used should be determined:

(1) in accordance with criteria specified in the AFM for the expected weather conditions; or

(2) if no such criteria are specified, by reducing the RVR determined for operation without the use of EFVS/CVS in accordance with Table 10;

(c) (…)

(d) (…).

[3] CS-AWO.A.EFVS.105
(…) (c) EFVS-L that is intended to be used from the DA/H through touchdown and roll-out at not less than 300 m (1 000 ft) RVR (…)

Table 10

Operations using EFVS/CVS — RVR/CMV reduction

RVR/CMV (m) required without the use of EFVS	RVR/CMV (m) with the use of EFVS
550	350*
600	400*
650	450*
700	450*
750	500*
800	550
900	600
1 000	650
1 100	750
1 200	800
1 300	900
1 400	900
1 500	1 000
1 600	1 100
1 700	1 100
1 800	1 200
1 900	1 300
2 000	1 300
2 100	1 400
2 200	1 500
2 300	1 500
2 400	1 600
* Reported RVR should be available (no CMV conversion).	

3.6.5 **Flight crew training for AWO.**

The training part of SPA.LVO is all under SPA.LVO.120, renamed ‘Flight crew competence’. The material has been expanded, providing more details over 10 AMCs and 4 GMs.

The competency to conduct the intended operations required in SPA.LVO.120(a) is specified in the first 3 AMCs. The experience required in Type or Class, or as PIC and related mitigating measures should be assessed by the operator and guidance is provided in GM1 SPA.LVO.120(a). Recent experience to be considered competent is laid out for EFVS in AMC2 and for the rest of the approach operations in AMC3 SPA.LVO.120(a).

Training requirements are detailed, referring to SPA.LVO.120(b).

Initial training and checking, where applicable, for LVTO in an RVR less than 400 m is covered by AMC1.

Initial training and checking for all approaches, except EFVS, are detailed in AMC2, and for EFVS in AMC3.

Recurrent checking for LVTO and all approaches, except for EFVS, are contained in AMC4 SPA.LVO.120, while AMC6 SPA.LVO.120 is on EFVS.

AMC5 covers the case of differences training when a new operation is added to the ones already approved and AMC7 SPA.LVO.120 is specific for differences training for EFVS operations.

Guidance on combinations of types of operations training requirements is provided in GM1. The GM also contains two very useful tables that summarize the requirements of initial and recurrent training and checking.

A recommendation on the recurrent training and checking of EFVS is given in GM2.

Finally, a list of items to possibly, include in-ground training is provided in GM3.

3.6.5.1 Difference training for AWO.

Point (a) AMC5 SPA.LVO.120(b), was intended amongst others, to allow operators already authorised LVO (e.g CATII) to progress to a lower LVO category or operations with operational credits (e.g. CAT II to CAT III) within the same type and without requiring completing all the provisions required in AMC2 SPA.LVO.120 (b), for that reason this option[4] (e.g. CAT II to CAT III) was not included in the AMC2 and it is regulated through AMC5 SPA.LVO.120(b) difference training and familiarisation.

3.7 Annex VI – Non-commercial operations complex motor power aircraft (Part NCC).

The changes introduced in the regulations applicable to AWO operations for NCC operators generally reflect those introduced in the CAT part:

- NCC.OP.101 introduces the requirement to establish the aforementioned verification and adjustment methods for the altimeter.
- NCC.OP.110 introduces changes analogous to those of point CAT.OP.MPA.110 in a manner appropriate to the type of NCC operations. The fundamental difference is that, in keeping with the declarative nature of the NCC operation, the aerodrome minima calculation method established by the operator in its manual does not require approval by the authority as in the CAT part.
- New requirements are introduced in relation to the selection of alternative destination aerodromes, both for aeroplanes (NCC.OP.147) and for helicopters (NCC.OP.148).
- NCC.OP.195 and NCC.OP.225 introduce similar changes to those referred to above for CAT.OP MPA.265 and CAT.OP.MPA.300 in relation to take-off, approach and landing conditions.
- Point NCC.OP.230 is aligned with what is referred to for point CAT.OP.MPA 305 in relation to the approach start and continuation criteria.
- Finally, there is a new requirement NCC.OP.235, which establishes the criteria for the EFVS 200 operation in a similar way to what is established in CAT.OP.MPA.312.

[4] flight crew members qualified CATII within an EU operator changing to CAT III on the same type and on the same operator.

3.8 Annex VII – Non-commercial operations other than complex motor power aircraft (Part NCO)

Similarly to what is referred to for NCC operators, the changes corresponding to AWO operations for NCO operators generally correspond to those for CAT operators with the corresponding modifications to adapt it to the typical operational environment of the NCO operator.

Point NCO.OP.101 is introduced, establishing altimeter verification and adjustment requirements in the same way as referred to for CAT and NCC.

In line with the aforementioned, the point corresponding to the minima of aerodrome use in relation to the calculation of the RVR (NCO.OP.110) is revised, clarifications are introduced on the use of the CDFA technique in 2D operations, calculation of the DH/MDH (NCO.OP.111) and NCO.OP.112 is modified in relation to the operating minima in the aerodrome circuit.

An important change is introduced in the selection criteria for destination alternate aerodromes. The points affected are NCO.OP.140 and NCO.OP.141, concerning the meteorological minima applicable at the destination (below which the destination alternate aerodrome is required) for both aeroplanes and helicopters and NCO. OP.142, in relation to the criteria related to the instrument approach procedures that must be available at the destination alternate. In addition, points NCO.OP.143 and NCO.OP.144 are added with the applicable meteorological minima at the destination aerodrome.

Likewise, points NCO.OP.175, NCO.205 and NCO.OP.206 are modified, in relation to take-off, approach and landing conditions in line with what was previously referred to for the CAT part.

Finally, point NCO.OP.210 is modified in relation to the criteria for starting and continuing the approximation.

3.9 Annex VIII – Specialised operations (Part SPO)

The changes for this type of operation are very similar to those listed above:

The new point SPO.OP.101 is introduced in relation to the verification and adjustment procedures of the altimeter that must be established by the operator.

SPO.OP.110 and its AMCs and GMs are modified in relation to aerodrome minima. The material to determine the applicable RVR and DH/MDH is concentrated on said normative point. SPO.OP.112 is also modified in relation to the minimums for circuit operations.

The new points SPO.OP.143 and SPO.OP.144 specify the minima that must be considered at the destination alternate aerodrome for aeroplanes and helicopters, respectively.

Points SPO.OP.180 and SPO.OP.210 are modified, in relation to take-off, approach and landing conditions in line with what was previously referred to for the CAT part.

Point SPO.OP.215 is modified in relation to the criteria for starting and continuing the approach.

Finally, point SPO.OP.235 is added, which, together with its AMCs and GMs, describes the requirements for EFVS 200 operation.

3.10 Downgraded equipment.

3.10.1 **Multiple failures of runway/FATO lights**

Several AMCs in Regulation (EU) 965/2012 Air OPS regulation contain the following text:

“Multiple failures of runway/FATO lights other than those indicated in Table X should not be acceptable”

See AMC11 SPA.LVO.110, AMC3 SPA.LVO.100(b), AMC9 NCC.OP.110, AMC9 SPO.OP.110 point (b)(1).

While the correct interpretation of this criterion is that any other combination of unserviceability prevents the conduct of that particular approach category, it is considered that this is applicable only if each individual unserviceability has an effect identified in the applicable Table.

For example, if 2 equipment are listed in table 6 AMC3 SPA.LVO.100 (b) are inoperative if one of them is labelled as “no effect”; only the specified effect of the second one is to be considered, and this combination does not lead to a prohibition of the related LVO approach. For instance, due to runway repairs, an airport announces that TDZ lights and runway centreline lights will become unserviceable. For an operator CAT III NO DH, the TDZ lights have “no effect” while centre line lights during the day have a penalty of 200 m RVR. Therefore, it would be acceptable to operate CAT III NO DH under an RVR of 200m in the day.

3.10.2 **Lighting**

Stakeholders requested to clarify when the lighting group is considered operative and when not. EASA decided not to clarify it at the level of the Regulation for the following reasons:

(a) It is for the aerodrome operator to decide whether a light system or part of a light system is to be considered serviceable. The tables for downgraded equipment contained in the Regulation should be sufficient for this decision based on the information received by NOTAM or other sources.

(b) It is difficult for an aircraft operator to get information at the level of detail required in the table below.

However, the table is provided here in order to help stakeholders in the understanding of the tables related to ‘downgraded equipment’ located in the several parts of the Air OPS Regulation (e.g. Part-CAT, Part-SPA).

Minimum serviceability for a lighting group to be considered operative

Lighting group	Minimum specification to be considered operative
Runway edge lights	— Minimum runway edge light spacing for an instrument runway is a maximum of 60 m. — Minimum runway edge light spacing for a non-instrument runway is 100 m. — Lights should be uniformly spaced in rows; however, at intersections to runways or due to temporary unserviceability, lights may be spaced irregularly or omitted, provided that adequate guidance remains available to the pilot.
Runway threshold lights	— A minimum of six threshold lights is required for a non-instrument runway. — On a precision approach runway CAT I, at least the number of lights that would be required if the lights were uniformly spaced at intervals of 3 m between the rows of runway edge lights, is required. — On a non-instrument or non-precision approach runway which has a displaced threshold, the runway threshold lights may be replaced by runway wing bar lights.
Runway wing bar lights	— Each wing bar should be formed by at least five lights extending at least 10 m outward from the runway edge lights.
Runway end lights	— A minimum of six runway end lights is required.
Runway centre line lights	— Minimum runway centre line light spacing is as a minimum 15 m

3.10.3 LOW-VISIBILITY TAKE-OFF (LVTO) OPERATIONS — EFFECT ON TAKE-OFF MINIMA OF TEMPORARILY FAILED OR DOWNGRADED EQUIPMENT

Related to GM2 SPA.LVO.100(a)

(a) The following provides further information related to non-nominal LVTO operations in the following cases already described in the GM2 SPA.LVO.100(a):

(1) runway lighting facilities have been downgraded or have failed;

(2) a reported RVR is below the minimum RVR;

(3) the RVR of a reporting point is not reported (not available); and

(4) an RVR reporting point representative for the initial part of the take-off run is not established.

(b) Downgraded or failed runway lighting facilities

(1) The commander/PIC is not expected to actively look out for downgraded or failed lighting facilities and may rely on the related official notices (ie NOTAM). If runway lighting facilities have been downgraded or have failed, refer to Table 1 of AMC1 SPA.LVO.100(a) to determine the resulting minimum RVR. Identify the cell in the column “Facilities” with the lighting facilities that remain operative. Determine the minimum RVR in the left column of the table, for example with runway edge lights having failed, LVTO both at night and day in an RVR below 400m is not permissible according to AMC1 SPA.LVO.100(a). Furthermore, take-off operations are not permissible at night

without runway edge lights according to table 1 of AMC1 CAT.OP.MPA.110, table 1 of AMC3 NCC.OP.110, or AMC3 SPO.OP.110.

(c) A reported RVR is below the minimum RVR

(1) In case the reported RVR representative of the initial part of the take-off run is below the minimum RVR, the take-off minima are satisfactory if it is established by pilot assessment that the RVR in that part of the runway is above the minimum RVR.

(2) The following exemplary scenarios are permissible according to AMC1 SPA.LVO.100(a):

(i) The TORA of a runway is 1 800 m or less and there is only one RVR reporting point established in the initial part of a take-off runway (i.e. touchdown zone). If the reported RVR representative of the initial part of the take-off run is below the minimum RVR, LVTO operations may still be conducted provided that the commander/PIC assesses that the RVR in the initial part is above the minimum RVR and the runway lighting facilities permit, including when the reported RVR is below 300 m.

(ii) The TORA of a runway is more than 1 800 m but not more than 2 100 m and there are two RVR reporting points established of which one is sited in the initial part of a take-off runway (i.e. touchdown zone) and the other one either at the midpoint or the stop-end of the runway. If the reported RVR representative of the initial part of the take-off run is below the minimum RVR, LVTO operations may still be conducted provided that the commander/PIC assesses that the RVR in the initial part is above the minimum RVR and the runway lighting facilities permit, including when the reported RVR is below 300 m.

(iii) The TORA of a runway is more than 2 100 m and there are three RVR reporting points established of which one is sited in the initial part of a take-off runway (i.e. touchdown zone), one at the midpoint, and one at the stop-end end of the runway. If the reported RVR representative of the initial part of the take-off run is below the minimum RVR, LVTO operations may still be conducted provided that the commander/PIC assesses that the RVR in the initial part is above the minimum RVR and the runway lighting facilities permit, including when the reported RVR is below 300 m.

(iv) The TORA of a runway is more than 2 100 m and there are three RVR reporting points established of which one is sited in the initial part of a take-off runway (i.e. touchdown zone), one at the midpoint, and one at the stop-end end of the runway. If the reported RVR representative of the stop-end is below the minimum RVR, LVTO operations may still be conducted provided that the commander/PIC establishes that the calculated take-off distance and accelerate-stop distance is such that the RVR of the stop-end is not relevant.

(d) RVR of reporting point is not reported

(1) The commander/PIC may assess the prevailing RVR for the initial part of the take-off run. This is the part in which the aircraft is stationary immediately before applying take-off thrust or where the take-off run begins. Point (e) of AMC1 SPA.LVO.100(a) does not provide for the option that the RVR in other-than the initial part of the take-off run is assessed by the commander/PIC.

(2) A pilot assessment of the RVR representative for the initial part of the take-off run may be useful if an RVR reporting point is established in the respective part of the runway (i.e. touchdown zone), but the RVR is not reported (i.e. only midpoint and/or stop-end RVRs are reported but touchdown zone RVR is out of service).

(3) For the exemplary scenarios in which the RVR of a reporting point is not reported, refer to the scenarios described above in points (c) (2) (i) to (iv) with the distinction that the respective reported RVR is not below the minimum RVR but the RVR is not reported at all.

(e) RVR reporting point representative for the initial part of the take-off run is not established

(1) According to AMC1 SPA.LVO.100(a), LVTO in RVRs below 400 m are not permissible on a runway with a TORA of 1 800 m or less, if there is only one RVR reporting point established of which the RVR is not reported. At least one RVR value needs to be reported for LVTO in an RVR below 400m.

(2) The following scenarios are permissible according to AMC1 SPA.LVO.100(a):

(i) The TORA of a runway is more than 1 800 m but not more than 2 100 m and there is only one RVR reporting point established at the midpoint or at the stop-end of the runway. LVTO operations may still be conducted provided that the commander/PIC assesses that the RVR in the initial part is above the minimum RVR and the runway lighting facilities permit, including when the reported RVR is below 300 m.

(i) The TORA of a runway is more than 2 100 m and there are only two RVR reporting points established of which one is sited at the midpoint and the other at the stop-end of the runway. LVTO operations may still be conducted provided that the commander/PIC assesses that the RVR in the initial part is above the minimum RVR and the runway lighting facilities permit, including when the reported RVR is below 300 m.

4 CHANGES INTRODUCED ON REGULATION (UE) 2021/1296 FUEL SCHEMES RELATED TO ALL WEATHER OPERATIONS.

Regulation (EU) 2021/1296 on Fuel schemes relates to All-weather operations. Some of the changes in the aerodrome selection policy (see CAT.OP.MPA.182 and related AMC&GM) has implications in AWO and vice versa.

4.1 AMC8 CAT.OP.MPA.182 and AMC9 CAT.OP.MPA.182 Fuel/energy scheme — aerodrome selection policy — aeroplanes

Table 3 in AMC8 CAT.OP.MPA.182 and table 4 in AMC9 CAT.OP.MPA.182 refers to "*3D Type A instrument approach operations, based on a facility with a system minimum of 200 ft or less.*"

The *"system minimum"* of each instrument approach facility can be found in AMC3 CAT.OP.MPA.110 table 4 "*system minima - aeroplanes*" for aeroplanes and AMC4 CAT.OP.MPA.110 table 6 "*system minima - helicopters*" for helicopters.

Therefore only the facilities of ILS/MLS/GLS, GNSS/SBAS (LPV) and Precision approach radar (PAR) are currently allowed to use this row in the AMC8 and AMC9.

AMC8 and AMC9 CAT.OP.MPA.182 Fuel/energy scheme — aerodrome selection policy — aeroplanes

BASIC FUEL SCHEME WITH VARIATIONS — PLANNING MINIMA

(…)

Row	Type of approach operation	Aerodrome ceiling (cloud base or vertical visibility)	RVR/VIS
(…)			
	3D Type A instrument approach operations, based on a facility with a system minimum of 200 ft or less	DA/H* + 200 ft	RVR/VIS** + 800 m
(..)			

(…)

AMC3 CAT.OP.MPA.110 Aerodrome operating minima

DETERMINATION OF DH/MDH FOR INSTRUMENT APPROACH OPERATIONS — AEROPLANES

(…)

Table 4

System minima — aeroplanes

Facility	Lowest DH/MDH (ft)
ILS/MLS/GLS	200
GNSS/SBAS (LPV)	200*

Facility	Lowest DH/MDH (ft)
Precision approach radar (PAR)	200
GNSS/SBAS (LP)	250
GNSS (LNAV)	250
GNSS/ Baro VNAV (LNAV/VNAV)	250
LOC with or without DME	250
SRA (terminating at ½ NM)	250
SRA (terminating at 1 NM)	300
SRA (terminating at 2 NM or more)	350
VOR	300
VOR/DME	250
NDB	350
NDB/DME	300
VDF	350

* For localiser performance with vertical guidance (LPV), a DH of 200 ft may be used only if the published FAS datablock sets a vertical alert limit not exceeding 35 m. Otherwise, the DH should not be lower than 250 ft.

5 AWO IMPLEMENTATION OF THE OPERATOR

5.1 PROJECT GUIDANCE FOR AN EXISTING LVO OPERATOR FOR TRANSITION INTO THE NEW RULES.

The operator's actions may be as follows:

1. Adapt all affected OMs regarding the removal of LTS CAT I, OTS CAT II & CAT IIIA/B.
2. Adapt OMs/Procedures/Checklists/Briefings regarding new terminology.
3. Review the Minimum equipment list to update the new terminology. Each individual operator should assess the impact of the regulatory changes regarding LVO operations on its particular MEL and propose the appropriate changes to the MEL, if necessary.
4. Definition of Type A & B approach concept in the OM.
5. Review the methodology to establish aerodrome operating minima and apply for approval. See actions for the service provider regarding the increase minima (Chapter 4 below).
6. Review of all minima tables (e.g. RVR vs. facilities).
7. Contact authority regarding the new and lower RVR minima (175 m) for CAT III with DH 50-99 ft.
8. Review of Safety Performance Monitoring & Data Collection Requirements (definition of successful Autoland).
9. Collect and review all recorded ACFT/RWY end LVOs/Autoland combinations.
10. Define and implement a process for the RWY suitability check (Previous Operational Data Assessment, Desktop Assessment, Operational Assessment).
11. Review new definitions of terms regarding AWO that are included in the OM-A.
12. Review of operational procedures for LVOs.
13. Flight Crew Training: adapt Training Syllabus.
14. Safety/FDM Department: adapt Autoland monitoring, especially touchdown point.

15. Submit the necessary application for revised approvals.

Note: The above list is a non-exhaustive list; for example, EFVS operations are not covered.

Note 1 – MEL referred to in point 3:

(a) MMELs should not pose a problem in respect of the removal of CAT III subcategories (e.g CAT III A or B), but the operators will need to review their MELs and introduce the changes that may be needed (e.g. Operator's MEL may refer to CAT IIIA).

(b) As a minimum and interim solution for the implementation of the new AWO regulatory framework, competent authorities may accept an explanation of the deletion of CAT III subcategories in the OM and MEL where the operator simply explain how to understand the old CAT IIIA/IIIB in relation to the new rules, e.g., "Where the expression CAT IIIA is used, it means a CAT III operation with DH ≥50 ft and RVR ≥ 175 m" instead of replacing every single reference in the OM/MEL.

(c) Best practice example: LBA Germany usually requires that LVO operators implement two kinds of information related to LVO minimum equipment list:

1- A table of minimum required equipment in the OM-B (or QRH) containing all the relevant equipment for the intended operations to ensure flight crews have the information at hand when preparing or conducting the LVO operation in order to perform the check in accordance with point (b) (1) of AMC2 SPA.LVO.105(c) (old point (b) (i) (2) of AMC1 SPA.LVO.125). The table derives from the AFM, for which the type certification holder is required to state all required equipment (e.g. refer to CS AWO.B.CATII.112 Minimum equipment for CAT II or CS AWO.B.CATIII.114 Minimum equipment for CAT III). The operator may add additional equipment to that list based on a risk assessment (ie autobrake for CAT II, flight director for take-off). This information is usually included in OM-B chapter 1 'Limitations' (see AMC3 ORO.MLR.100 for CAT operators).

2- Equipment which affects the aircraft's dispatch status and is relevant for flight or fuel planning. It should be available not only to flight crew but also to dispatch personnel and should be contained in the MEL, which is OM-B chapter 9 MEL (see more in AMC3 ORO.MLR.100 for CAT operators). This is now required in (d) of SPA.LVO.105 (which used to be the point (a) of SPA.LVO.130). Furthermore, the "scope" of the MEL should explicitly state the approved Low visibility operations, so the pilot and dispatchers can find all relevant LVO items. Note: MEL is usually relevant only until engines start. Flight crews usually do not refer to the MEL for in-flight failures/system degradations.

3- Operators that have already implemented both of the above-mentioned information in the OM do not need to do anything "new". The others might need to adapt the OM as mentioned above and adapt dispatch processes.

5.2 MEL regulatory references refer above.

SPA.LVO.105 Specific approval criteria

To obtain a specific approval as required by SPA.LVO.100, the operator shall demonstrate that:
(a) for low-visibility approach operations, LVTO operations in an RVR less than 125 m, and operations with operational credits, the aircraft has been certified for the intended operations;
(b) the flight crew members are competent to conduct the intended operation and a training and checking programme for the flight crew members and relevant personnel involved in the flight preparation has been established, in accordance with SPA.LVO.120;
(c) operating procedures for the intended operations have been established;
(d) any relevant changes to the minimum equipment list (MEL) have been made;

AMC2 SPA.LVO.105(c) Specific approval criteria

OPERATING PROCEDURES — GENERAL

(a) (…)

(b) Operating procedures should include:

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

6 AWO IMPLEMENTATION OF THE SERVICE PROVIDER

Service providers/ Chart providers should prioritise the update of minima for those approaches where the minima before 30.10.2022 would be lower than the minima after 30.10.2022. This is a critical element in terms of flight safety. This task must be completed by 30.10.2022 for example by means of providing information to the users about those the higher minima changed until the next available AIRAC cycle.

Generally speaking, the new AWO regulatory framework usually allows a lower minima than before 30.10.2022, however, there may be a few situations where the minima before 30.10.2022 may be lower than what would be legally required after 30.10.2022. As an example (non-exhaustive list):

- An approach to a non-precision runway served by a precision navigation equipment such as CAT I ILS. With the old regulatory framework (before 30.10.2022) the industry was usually using CAT I minima. However, the new rules mandate considering the runway. In this case, the non-precision approach runway should be taken into account, and therefore, the minima would be limited by this element (non-precision runway) which may lead to higher minima in the new regulatory framework.
- In the new regulatory framework (after 30.10.2022) the former CAT III A will be raised to a DH of 50 feet while before in the old regulatory system (before 30.10.2022) the DH could be as low as NO DH.

NOTE: AIRAC cycle in late 2022 is on the 3 of November 2022.

6.1 TYPE A and TYPE B instrument approach operations

The new AWO regulation – Reg. (EU) 2021/20236 – introduces the ICAO terminology of Type A & B instrument approach operations:

Regulation (EU) 2021/2036:

"(120d)'Type A instrument approach operation' means an instrument approach operation with an MDH or a DH at or above 250 ft;
(120e)'Type B instrument approach operation' means an operation with a DH below 250 ft. Type B instrument approach operations are categorised as:
(a) Category I (CAT I): a DH not lower than 200 ft and with either a visibility not less than 800 m or an RVR not less than 550 m;
(b) Category II (CAT II): a DH lower than 200 ft but not lower than 100 ft, and an RVR not less than 300 m;
(c) Category III (CAT III): a DH lower than 100 ft or no DH, and an RVR less than 300 m or no RVR limitation;"

In the new regulatory environment, a precision approach with minima above DH 250 feet would be considered a Type A instrument approach operation. This categorisation has several implications in AWO, in the aerodrome selection policy (CAT.OP.MPA.182) and therefore in Fuel planning (CAT.OP.MPA.181).

- NOTE: ICAO has initiated a process to remove those terms (Type A and B), EASA is currently assessing the impact of this decision in the European regulatory framework in order to find a suitable Rulemaking task to amend the regulatory framework. It is not recommended to use those terms in National regulations.

6.2 EFVS operations

The service provider may update the operating minima, considering the EFVS credit for RVR customised for the aircraft type certified visual advantage.

The service provider may declared if the necessary requirement for the suitability of EFVS operations into a particular runway has being check. This depends on type of operation for which the operator is approved (generally speaking EFVS-L has more stringent requirements than EFVS-A and EFVS-A has usually more stringent requirements than EFVS-200).Please referred:

- For EFVS 200: AMC1 & AMC2 of CAT.OP.MPA.312(a)(2) / NCC.OP.235(a)(2) and
- For EFVS-A: & -L: AMC1 & AMC2 of SPA.LVO.110 and GM12.SPA.LVO.110

7 AWO IMPLEMENTATION OF THE AUTHORITY

7.1 General

This document contains actions needed for the application and issue of any kind of specific approvals under SPA.LVO on 31 October 2022. The document is applicable to existing successful operations, i.e. the same operator using the same aircraft model(s) at the same runways. These operations are grandfathered based on the existing operational data/experience.

Notwithstanding the statement above, the following items must be considered as applicable to the respective kind of LVO.

1. The safety assessment of the intended operations and the performance indicators needed to monitor the level of safety (SPA.LVO.105);
2. The reporting of incidents as prescribed (AMC3 ORO.GEN.160 and GM1 ORO.GEN.160)
3. The competence of flight crew members (SPA.LVO.120(a))
4. The training and checking of flight crew members (SPA.LVO.120(b))
5. Flight crews' training programmes require approval at syllabi level.
6. The approval of the method of establishing aerodrome operating minima for any kind of operations including LVO. The method must already be established and specified in the OM, but an approval is now required. A few items to be considered have been added. (CAT.OP.MPA.110).

Operations that are new, e.g. new runways, new aircraft models… etc, are subject to review in accordance with the entire SPA.LVO as applicable. ‘AMC5 ARO.OPS.200 Specific approval procedure PROCEDURES FOR THE APPROVAL OF LOW-VISIBILITY OPERATIONS’ provides the elemens to be verify when approving.

Note: other prior-approval items that before 30.10.2022 did not required prior approval but after 30.10.2021 requires prior-approval are related to the fuel schemes (Regulation (EU) 2020/1296):

1- Aerodrome selection policy link to the approval of Fuel schemes.
2- In flight fuel management policy link to the approval of Fuel schemes.
3- Special Refuelling procedures and defueling.

AMC5 ARO.OPS.200 Specific approval procedure

PROCEDURES FOR THE APPROVAL OF LOW-VISIBILITY OPERATIONS

Before issuing an approval for low-visibility operations (LVOs), the competent authority should verify that the applicant has:

(a) taken account of the relevant airworthiness requirements and limitations;

(b) established the relevant aerodrome operating minima;

(c) established and documented the relevant operating procedures;

(d) established and conducted adequate training and checking programmes;

(e) adopted the minimum equipment list (MEL) for the LVOs to be undertaken;

(f) processes to ensure that only runways and instrument procedures suitable for the intended operations are used; and

(g) established and conducted the relevant risk assessment and monitoring programmes.

7.2 Approval of CAT III

7.2.1 175 meters (former CAT III A 200 meters)

The ED Decision 2022/012/R has replaced the old CAT III A with an RVR 200 meters to a CAT III that means that DH and RVR would be stablished by the operator following table 5 in AMC2 SPA.LVO.100(b), that means that the limitation will come through the aircraft equipment used, thus, if the aircraft is certified in accordance with CS-AWO.B.CATIII.113 for approach operations with a DH of 50 ft or greater, then the RVR would be 175 meters (DH 50 ft or above), however if the aircraft is certified for lower than 50 ft or no DH then the RVR may be lower (up to RVR 75 meters depending on the roll-out control/guidance system installed in the aircraft).

Old

Category of Operation	Decision Height (DH)	RVR
CAT III A	lower than 100 ft or no DH	not less than 200 m

New table 5 AMC2 SPA.LVO.100(b)

CAT III DH (ft)	Roll-out control/guidance system	RVR (m)*
50-99 ft	Not required	175

The old approval CAT III A RVR 200m can be credited to CAT III as follows:

Option A Prior approval - Grandfathering:

1. The operator does NOT amend its training and checking programme to reflect the new minima 175 m and instead, it keeps 200 m.
2. The operator amends its SOP and manuals only to reflect the replacement of CAT III A to CAT III (editorial amendment). However, the operator maintained an RVR of 200 m.
3. The Operator notifies the authority about the replacement of CAT III A to CAT III (if the operator is entitled to perform those amendments without prior approval. Note: An amendment to the operations manual including only minor editorials should not be considered a change and therefore should not require a prior approval under ARO.OPS.200, ORO.GEN.130(b) and GM1 ORO.GEN.130(b).
4. The authority amends OPS SPEC to reflect the new naming convention in regard to CAT III and maintains the RVR 200 meters in the new OPS SPEC form. Note the operations specification is part of the certificate of the AOC and therefore if there is a changed of the scope of the operations specification.

ARO.OPS.100 Issue of the air operator certificate

Regulation (EU) No 379/2014

(a) The competent authority shall issue the air operator certificate (AOC) when satisfied that the operator has demonstrated compliance with the elements required in ORO.AOC.100.

(b) The certificate shall include the associated operations specifications.

(c) The competent authority may determine specific operational limitations. Such limitations shall be documented in the operations specifications.

ORO.GEN.130 Changes related to an AOC holder

Regulation (EU) No 379/2014

(a) Any change affecting:

(1) the scope of the certificate or the operations specifications of an operator; or

(2) any of the elements of the operator's management system as required in ORO.GEN.200(a)(1) and (a)(2),

shall require prior approval by the competent authority.

(…)

Option B Pior approval changed of minima

1. The operator amends its training and checking programme to reflect the new minima 175 m.
    - The training should highlight the new visual scenario (visual cues) at DH. From 200 m to 175 m the difference is about one light difference in the centre line.
2. The operator does not need to conduct an additional simulator check; however, the next regular OPC/LPC/EBT Module should follow the new amended values (175 m).
3. The Operator amend its SOP in accordance with CAT III RVR175m.
4. The authority may amend Operators OPS SPEC at the same time it approves the operator's training and checking programme and SOPs.

NOTE: there will be a transition phase from the Chart providers where the replacement of CAT III A to CAT III will live together.

7.3 Approval of Operational credits.

7.3.1 Special authorisation CAT I - SA CATI (former LTS CAT I).

SA CATI is a new operation credit with a DH of 150 feet or above and an RVR of 400 meters or above. SA CATI is an evolution from LTS CATI. However, the approval of LTS CATI can not be credited directly into SA CATI. The main difference is related to aircraft certification. The new CS-AWO issue 2 introduced a new set of criteria to certify an SA CATI. This new certification specification ensures that the Autoland (or alternative technology) maintains the centre line even with a lower performant ground equipment (CATI instead of CAT II). Thus, automatic credit from LTS CATI to SA CATI should not happen, even if the minima proposed by operator of the new SA CATI is the same as the LTS CATI. This approach is supported by many countries in the EU (e.g. Germany, Sweden,…etc).

EASA is aware of the impact of not allowing automatic credits from LTS CATI to SA CATI. However, the impact is rather low as there are not many operators authorised for LTS CATI (e.g. only a few countries have authorised LTS CATI and only a few operators of those countries got approved).

7.3.2 SA CAT II from OTS CAT II

The ED Decision 2022/012/R has replaced the old OTS CAT II with the SA CAT II

Old

Category of Operation	Decision Height (DH)	RVR
OTS CAT II	100 ft	not less than 350 m

New

SA CAT II DH (ft)	Aircraft Equipment	RVR (m)*
100 ft	Auto-land or approved HUDLS utilised to touchdown	not less than 350 m

The old approval OTS CAT II can be credited to SA CAT II as follows:

Option A Grandfathering:

1. The operator does NOT amend its training and checking programme.
2. The operator amends its SOP and manuals (including OM D) only to reflect the replacement of OTS CAT II to SA CAT II (editorial amendment).
3. The Operator notifies the authority about the replacement of OTS CAT II to SA CAT II (if the operator is entitle to perform those amendments without prior approval. Note: An amendment to the operations manual including only minor editorials should not be considered a change and therefore should not require a prior approval under ARO.OPS.200, ORO.GEN.130(b) and GM1 ORO.GEN.130(b).
4. The authority amends OPS SPEC to reflect the new naming convention in regard to SA CAT II and maintains the RVR 350 meters in the new OPS SPEC form.

Option B

1. The operator amends its training and checking programme to reflect the new SA CAT II.
2. The operator does not need to conduct an additional simulator check.
3. The Operator amend its SOP in accordance with SA CAT II.
4. The authority may amend Operators OPS SPEC at the same time it approves the operator's training and checking programme and SOPs.

NOTE: there will be a transition phase from the Chart providers where the replacement of OTS CAT II to SA CAT II will live together.

AMC2 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS — SPECIAL AUTHORISATION CATEGORY II (SA CAT II)

For special authorisation category II (SA CAT II) operations, the following should apply:

(a) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process, and be not lower than the highest of:

(1) the minimum DH specified in the AFM, if stated;

(2) the applicable OCH for the category of aeroplane;

(3) the DH to which the flight crew is qualified to operate; or

(4) 100 ft.

(b) The following visual aids should be available:

(1) approach lights as specified in Table 9;

(2) precision approach runway markings;

(3) category I runway lights.

(c) The lowest RVR minima to be used are specified in Table 9:

Table 9

SA CAT II operation minima: RVR (m) versus DH (ft)

Class of light facility		FALS	IALS	BALS	NALS
DH (ft)	100–120	350	450	600	700
	121–140	400	500	600	700
	141–160	400	500	600	750
	161–199	400	550	650	750

7.4 Amendments to the AIP

The airport authorities should amend the AIP to reflect the deletion of CAT III A, B and include simply CAT III. The airport authorities should provide, as a minimum, the ILS classification (e.g. III/D/4). This will allow the service provided to identify the ILS facility. Alternatively, the airport authority may provide the DH and RVR minima.
The ILS classification in the new rules is particularly important when the chart is changed to the new terminology because of the removal the labels CAT III A or B.

For EFVS operation the Airport authorities should provide (non-exhaustive list):

- Whether the instrument approach procedure is designed in accordance to PANS-OPS Vol II and whether is straight in.
- The location and presence of the LED lights. Specially on the approach lighting system and runway. As required by the Aerodrome regulation.
- The switchover time of the standby power for runway/approach lights. Note: for European Aerodromes the requirement is stablished in AMC1 ADR.OPS.B.045(a)(3) point (5) *'the switch-over time for runway edge, threshold and end lights meets the specifications in CS ADR-DSN.S.880 for CAT II/III runways'*
- The status of obstacle penetration in the Visual Segment Surface (VSS). This needs to be described for all of the intended instrument approach minima operation relevant for EFVS.
- In addition, for EFVS-A
    - (1) Whether LVP for approach and landing operations are stablished in operations below 550 meters; and
    - (2) The minimum visibility in which the airport is allowed to operate (for example, the airport needs stop bars to accept operations lower than 350 meters).
    - (3) The presence of touchdown zone RVR measurement sensor.
- In addition to EFVS-A, for EFVS-L
    - (1) an aerodrome obstacle chart – ICAO Type A is published in the AIP; and
    - (2) a precision approach terrain chart – ICAO is published in the AIP.
- Other items may be necessary please refer to the applicable regulation.

7.5 OPS SPECS Appendix II to Annex II (Part-ARO) EASA Form 139 Issue 7

This chapter describes the recommended practice for the Competent authority to fill out the OPS SPEC:

a) As a minimum, the Authority should:

1) State each type of approach: In low visibility operations/approach and landing: CAT II, CAT III.
2) DA/H, the minimum authorised DH. For example, NO DH or DH 20ft…etc.
3) RVR (m): The minimum RVR authorised. For example75 m.

Note: Operations Specifications in the ICAO All-Weather Operations Manual (Doc 9365) and ICAO Annex 6 do not contradicts or expands on the instruction in Annex 6, which reads: "Insert the

applicable precision approach category (CAT II or III). Insert the minimum RVR in metres and decision height in feet. One line is used per listed approach category"

b) The recommended practice: EASA recommends to provide more details than the ICAO minimum. Amongst other FAA uses a more detailed approach to the OPS spec and for certain foreign approvals a detailed OPS SPEC would be beneficial for the Operator in order to facilitate the paperwork with foreign authorities. In the recommended practice the following should be completed:

1) State each type of approach and technology used: In low visibility operations/approach and landing: CAT III fail-passive, CAT III fail-operative, etc. One line for each type of approach and technology combination.
2) DA/H, the minimum authorised DH for each type of approach and technology used. For example, CAT III fail-passive: DH: 50 ft, CAT III fail-operative with DH: DH 20 ft.
3) RVR (m): The minimum RVR authorised for each type of approach and technology used. CAT III fail-passive: DH: 50 ft RVR 175 m, CAT III fail-operative with DH: DH 20 ft RVR 125 m.

7.5.1 Format of the OPS Specs (example)

OPERATIONS SPECIFICATIONS **(subject to the approved conditions in the operations manual)**				
Issuing authority contact details Telephone (1): _____; Fax: _____; Email: _____				
AOC (2):	Operator name (3):		Date (4):	Signature:
	Dba trading name			
Operations specifications #:				
Aircraft model (5): Registration marks (6):				
Types of operations: Commercial air transport				
☐ Passengers	☐ Cargo		☐ Others (7): _____	
Area of operation (8):				
Special limitations (9):				
Specific approvals:	Yes	No	Specification (10)	Remarks
Dangerous goods:	☐	☐		
Low-visibility operations				
Take-off	☐	☐	RVR (11):.. m e.g., RVR 125 m RVR 75 m (guided)	
Approach and landing	☐	☐	CAT (12).... DA/H: ft, RVR:.. m *Example of recommended practice:* CAT II: DH 100 ft RVR 300 m CAT III fail-passive: DH: 50 ft RVR 175 m CAT III fail-operative with DH: DH 20 ft RVR 125 m CAT III no DH: RVR 75 m. *Example short version:*	

			CAT II with DH: 120 ft RVR 300 m *CAT III no DH: RVR 75 m*	
Operational credits	☐	☐	CAT [13].....DA/H: ft, RVR:... m *Example of recommended practice:* SA CAT I: DH 150 ft RVR 400 m SA CAT II: DH 100 ft RVR 350 m EFVS-A: RVR 350 m. EFVS-L: RVR 300 m. *Example short version:* *EFVS: RVR 300 m*	
RVSM [14] ☐ N/A	☐	☐	☐	
ETOPS [15] ☐ N/A	☐	☐	☐ Maximum diversion time [16]: min.	
Complex navigation specifications for PBN operations [17]	☐	☐		[18]
Minimum navigation performance specification	☐	☐		
Operations of single-engined turbine aeroplane at night or in IMC (SET-IMC)	☐	☐	[19]	
Helicopter operations with the aid of night vision imaging systems	☐	☐		
Helicopter hoist operations	☐	☐		
Helicopter emergency medical service operations	☐	☐		
Helicopter offshore operations	☐	☐		
Cabin crew training [20]	☐	☐		
Issue of CC attestation [21]	☐	☐		
Use of type B EFB applications	☐	☐	[22]	
Continuing airworthiness	☐	☐	[23]	
Others [24]				

(1) Telephone contact details of the competent authority, including the country code. Email to be provided as well as fax if available.

(2) Insertion of associated air operator certificate (AOC) number.

(3) Insertion of the operator's registered name and the operator's trading name, if different. Insert 'Dba' before the trading name (for 'Doing business as').

(4) Issue date of the operations specifications (dd-mm-yyyy) and signature of the competent authority representative.

(5) Insertion of ICAO designation of the aircraft make, model and series, or master series, if a series has been designated (e.g. Boeing-737-3K2 or Boeing-777-232).

(6) The registration marks are listed either in the operations specifications or in the operations manual. In the latter case, the related operations specifications must make a reference to the related page in the operations manual. In case not all specific approvals apply to the aircraft model, the registration marks of the aircraft may be entered in the remark column to the related specific approval.

(7) Other type of transportation to be specified (e.g. emergency medical service).

(8) Listing of geographical area(s) of authorised operation (by geographical coordinates or specific routes, flight information region or national or regional boundaries).

(9) Listing of applicable special limitations (e.g. VFR only, Day only, etc.).

(10) List in this column the most permissive criteria for each approval or the approval type (with appropriate criteria).

(11) Insertion of approved minimum take-off RVR in metres. One line per approval may be used if different approvals are granted.

(12) Insertion of applicable precision approach category: CAT II or CAT III. Insertion of minimum RVR in metres and DH in feet. One line is used per listed approach category.

(13) Insertion of applicable operational credit: SA CAT I, SA CAT II, EFVS, etc. Insertion of minimum RVR in metres and DH in feet. One line is used per listed operational credit.

(14) The Not Applicable (N/A) box may be checked only if the aircraft maximum ceiling is below FL290.

(15) Extended range operations (ETOPS) currently applies only to two-engined aircraft. Therefore, the Not Applicable (N/A) box may be checked if the aircraft model has less or more than two engines.

(16) The threshold distance may also be listed (in NM), as well as the engine type.

(17) Performance-based navigation (PBN): one line is used for each complex PBN specific approval (e.g. RNP AR APCH), with appropriate limitations listed in the 'Specifications' or 'Remarks' columns, or in both. Procedure-specific approvals of specific RNP AR APCH procedures may be listed in the operations specifications or in the operations manual. In the latter case, the related operations specifications must have a reference to the related page in the operations manual.

(18) Specify if the specific approval is limited to certain runway ends or aerodromes, or both.

(19) Insertion of the particular airframe or engine combination.

(20) Approval to conduct the training course and examination to be completed by applicants for a cabin crew attestation as specified in Annex V (Part-CC) to Regulation (EU) No 1178/2011.

(21) Approval to issue cabin crew attestations as specified in Annex V (Part-CC) to Regulation (EU) No 1178/2011.

(22) Insertion of the list of type B EFB applications together with the reference of the EFB hardware (for portable EFBs). This list is contained either in the operations specifications or in the operations manual. In the latter case, the related operations specifications must make a reference to the related page in the operations manual.

(23) The name of the person or organisation responsible for ensuring that the continuing airworthiness of the aircraft is maintained and a reference to the regulation that requires the work, i.e. Subpart G of Annex I (Part-M) to Regulation (EU) No 1321/2014.

(24) Other approvals or data may be entered here, using one line (or one multi-line block) per authorisation (e.g. short landing operations, steep approach operations, reduced required landing distance, helicopter operations to or from a public interest site, helicopter operations over a hostile environment located outside a congested area, helicopter operations without a safe forced landing capability, operations with increased bank angles, maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval).

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8 AWO IMPLEMENTATION OF AERODROMES

8.1 Implementation of Low Visibility Procedures.(LVP) for take-off with Runway Visual Range (RVR) below 550 m.

The provisions of All-Weather Operations (AWO), for the air operator described in point (b)(7) of AMC2 SPA.LVO.105(c), do not required LVPs for take-off operations in runway with a runway visual (RVR) between 400 m and 550 m, while the aerodrome Regulation (EU) No 139/2014 requires the implementation of LVPs to support this operation. This chapter clarifies the regulatory requirements and present the expectations of the regulator concerning take-off operations with an RVR less than 550 m.

8.1.1 Regulatory overview

Regulation (EU) No 139/2014, as amended by Commission Delegated Regulation (EU) 2022/208, defines low visibility operations as approach or take-off operations on a RVR of less than 550m or a decision height of less than 200ft. Furthermore, low visibility procedures are defined as procedures applied at an aerodrome for the purpose of ensuring safety during low-visibility operations. In addition, 'low visibility take-off (LVTO)' is defined as a take-off with a RVR below 550 m.

In accordance with ADR.OPS.B.045 low visibility procedures must be established and implemented where the aerodrome is intended to be used to support low visibility take-offs, approach and landing operations with RVR less than 550 m or DH less than 200 ft and operations with operational credits where the actual RVR is less than 550 m.

8.1.2 How to apply in practice at an aerodrome

The main objectives of low visibility procedures are to prevent runway incursions and to protect the integrity of the signal of the navigational aids during approach and landing operations. For runways approved for approach and landing operations with a RVR of less than 550 m or a decision height less than 200 ft, take - off operations are always safeguarded by low visibility procedures.

The fact that a runway may only be approved for approach and landing operations down to CAT I minima, does not prevent take-off operations with a RVR below 550 m. In this case, the aerodrome must implement low visibility procedures to prevent runway incursions. The level of complexity depends on the aerodrome layout and the traffic density. While the installation of stop bars may be one solution, this may not be the only solution, for example the aerodrome can implement a procedures where only one aircraft movement at a time, restriction of vehicles to access the manoeuvring area, standard taxi routes, good condition and functionality of markings and signs, etc.

In any case, low visibility procedures need to be coordinated with air traffic services and details must be published in the AIP. Detailed information must be included in AD 2.22 Flight Procedures in the AIP (see Regulation (EU) 2017/373 as amended by Commission Implementing Regulation (EU) 2022/938).

9 FREQUENTLY ASK QUESTIONS & ANSWERS (FAQ).

9.1 All-weather operations - Questions related to Regulation (EU) 2021/2237 (AWO Regulation)

1. **Does the NAA need to issue a new approval under SPA.LVO if the operator has changed nothing in its LVO procedures?**

Yes, approval by the competent authority is needed.

SPA.GEN.115 establishes that when the conditions of a specific approval are affected by changes, the operator shall obtain prior approval from the competent authority. In this case, even if there are no changes to the operators' procedures, there are some changes that were introduced by the AWO Regulation and that need to be made to the scope of the activities that is specified and documented in the operations specifications to the AOC (or in the list of specific approvals, for operators not holding an AOC), in accordance with SPA.GEN.110 (for example, the changes from CAT III A or B to CAT III operations).

However, the level of verification needed for the competent authority to conclude that the operator is compliant in accordance with ARO.GEN.330(a) should depend on the scope of the changes and on the results of past certification and/or oversight activities. For example, if the only change is replacing the references to CAT III A or B with references to CAT III operations, and the operator has not changed its procedures and training and was compliant with SPA.LVO requirements before the applicability of the changes introduced by the AWO regulation, then the level of effort to process the approval should be rather low.

EASA recommends that NAAs use information collected during their continued oversight processes to determine the level of verification needed to approve the changes in accordance with ARO.GEN.330.

Further guidance on this topic has been included in Chapters 6.2 and 6.5 of the AWO Implementation Manual.

2. **Does the NAA need to issue the new operations specifications (OPS SPECs) in accordance with Appendix II to Part-ARO as amended by the AWO Regulation within the applicability date? (and how it would be treated in case of SAFA/SACA inspections after 30 of October)**

Yes, new OPS SPECs in accordance with the AWO Regulation need to be issued.

The OPS SPECs are the place where the scope of the activities performed by the operator are defined (ORO.AOC.105), and any change affecting the scope of the certificate or the OPS SPECs of an operator is subject to prior approval by the competent authority (ORO.GEN.130).

However, the level of verification needed for the competent authority to conclude that the operator is compliant in accordance with ARO.GEN.330(a) should depend on the scope of the changes and on the results of past certification and/or oversight activities. See reply to Question 1 for more details.

Further guidance on this topic has been included in Chapter 6.5 of the AWO Implementation Manual

As regards SAFA/SACA inspections we are reviewing with the RAMP coordination community the approach to take on the OPSPECs and intent to come back to you as soon as practical.

3. Would you please confirm that EFVS 200 Ops do not need neither prior approval nor specific approval?

EFVS 200 operations do not require specific approval by the competent authority. This is clearly stated in SPA.LVO.100 (c). But, if the aircraft is not certified for EFVS-A or L and the operator would like to make use of EVSs equipment for EFVS 200 operation then the following applies:

(1) An approval from the competent authority is required (in accordance with CAT.OP.MPA.312 point (c), NCC.OP.235 point (c) or SPO.OP.235 point (c)), and;
(2) The EVS should be certified before 01.Jan.2022 as 'EVS with an operational credit' (see AMC1 CAT.OP.MPA.312(c), AMC1 NCC.OP.235(c), AMC1 SPO.OP.235(c))

It should be noted that an operator cannot undertake this type of operation without changes to its Operations Manual (OM), MEL, and training programmes (OM D). Changes to the training and checking programmes and the MEL are items that require prior approval from the competent authority under ORO.GEN.130, ORO.MLR.105(b), and ORO.FC.145(c). Therefore, even if the operation itself is not subject to specific approval by the competent authority, there is a need to approve related changes to the operator.

It should be noted that the implementation of EFVS 200 is voluntary. There is no mandate to implement these operations on 30.10.2022

4. Can you clarify what is meant by the "limited-visibility approach operations" referred to in AMC9 CAT.OP.MPA.182 (b), as we are unable to trace this definition in the regulation.

The reference to "limited-visibility approach operations" in AMC9 CAT.OP.MPA.182 (b) was an editorial mistake that was corrected in August 2022 by ED Decision 2022/014/R. It is meant to say "low-visibility approach operations"

5. Can an operator currently approved for LTS CAT I and/or OTS CAT II automatically receive the operational credit for SA CAT I and/or SA CAT II, provided that the operations manual is updated and approved in accordance with the new AWO Regulation?

The AWO regulation does not foresee an automatic credit.

However, the level of verification needed for the competent authority to conclude that the operator is compliant and approve the change in accordance with ARO.GEN.330 (a) should depend on the scope of the changes and the results of past certification and/or oversight activities.

In the case of the change from OTS CAT II to SA CAT II, the substance of the requirements has not changed. If the change is limited to changing the references in the OM from OTS CAT II to SA CAT II, the operator has not changed its procedures and training, and the operator was compliant with the requirements before the applicability of the changes introduced by the AWO Regulation, then the level of effort to process the approval should be rather low.

Further guidance on this topic has been included in Chapter 6.3.2 of the AWO Implementation Manual.

In the case of the change from LTS CAT I to SA CATI, the content of the requirements has changed; therefore, operational credits cannot automatically be applied, and more attention is needed from the competent authority to approve the change in accordance with ARO.GEN.330.

EASA recommends that NAAs use information collected during their continued oversight processes to determine the level of verification needed to approve the changes in accordance with ARO.GEN.330.

6. Do you need to re-issue an OPS SPEC when the operator is NOT approved for LVO?.

Yes, but only in the next available substantial amendment or no later than 30.04.2023. As the operator does not have any amendments to do to the OPS SPEC.

7. **Is it required that LVPs are in force for low visibility take-off (LVTO) with reported meteorological conditions below RVR < 550m? If it is required, LVPs for LVTO should be included as a mitigation measure?**

Low visibility procedures (LVP) were required in the former SPA.LVO.115 when conducting LVOs. The former regulation only considered as LVTOs take-offs below 400 m RVR. The new regulatory framework in Regulation (EU) 2021/2237 defines LVTOs as a take-off below 550 m RVR. However, the new AMC2 SPA.LVO.105 point (b)(7) only requires LVPs for those LVTOs below 400 m. Therefore, the requirements in practice remain the same.

Please note that for European aerodromes (EASA aerodromes), the LVP should be enforced in RVRs below 550 meters (both for take-off and/or approaches). See more in AMC2 SPA.LVO.105(c) point (b)(7).

For more information, please refer to the table in chapter 3.6.1 of this manual.

8. What source of data should the operator use to identify LVO in the safety performance monitoring system in accordance with AMC1 SPA.LVO.105(g)?

The identification of the LVO operation may be done through flight crew reports. For instance, technical log entry, etc.

8.1. Do provisions of points (b), (d), (e) from AMC1 SPA.LVO.105(g) apply to LVTO operations?

The aforementioned requirements for monitoring, data collection and performance indicators only apply to LVO approaches and approach operations with operational credits. The next update of subpart SPA.LVO planned for summer 2023 will amend the title of the AMC1 SPA.LVO.105 to improve clarity on this matter.

9. As a foreign non-commercial operator (i.e. part 91 operator), do they need a LoA to operate EFVS in Europe?

The non-commercial operator is expected to comply with the applicable international standards as laid down in the ICAO Annexes, (unless EASA/EU rules provides alleviation).

ICAO Annex 6 says:

Part II - "2.2.2.2.1.1 The State of Registry shall authorize operational credit(s) for operations with advanced aircraft. Where the operational credit relates to low visibility operations, the State of Registry shall issue a specific approval.(…)"

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

While EASA regulation says:

Part SPA.LVO.100: low visibility operations (iaw ICAO definition) shall only be conducted if they are approved by the competent authority.

European Non-Comercial Complex motor power aircraft (NCC) operators are required to provide specific approvals granted for conducting operations with operational credits (see Declaration in Appendix I to Annex III Part-ORO).

Therefore:

Non-commercial operators (i.e. USA FAA's non-commercial operators) should provide an LOA C048 (or equivalent document) as a means of compliance with Annex 6 Part II when they are intending or entitled to operate EFVS in low-visibility (iaw ICAO Annex 6 Part II SARP 2.2.2.2.1.1).

Non-commercial operators (i.e. USA FAA's non-commercial operators) are NOT required to provide an LOA C048 (or any other equivalent document) when their EFVS operations are intended to be restricted to non-low-visibility conditions (but possibly still benefiting from visual advantage, e.g. EFVS200 operations).

9.2 All-weather operations and Fuel Schemes - Questions related to Aerodrome selection policy in Regulation (EU) 2021/2196 (FUEL Regulation)

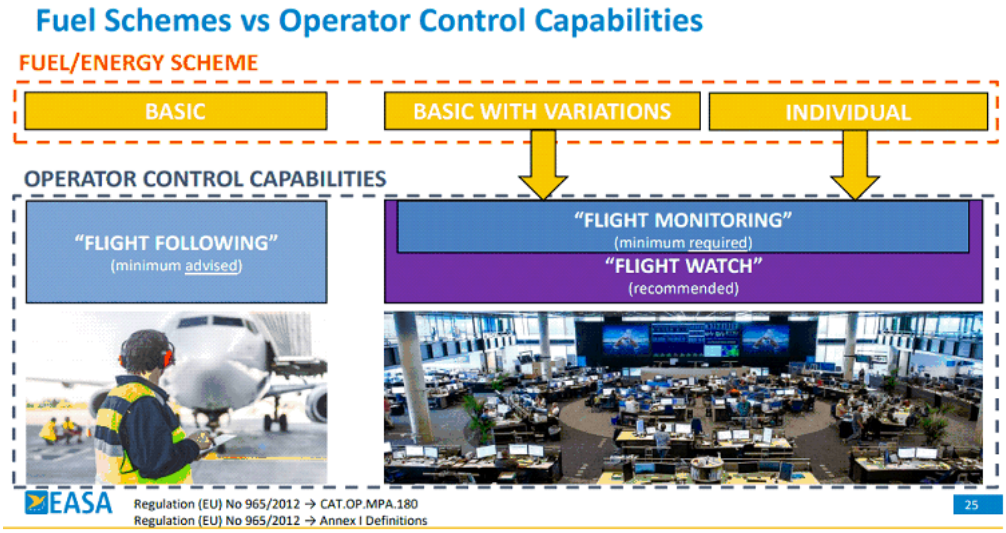
10. In the case of basic fuel schemes with variations, can you confirm that the operator only needs to follow the AMC of the variation it intends to apply, together with the AMC for the basic fuel scheme? For example, if an operator chooses to apply only the contingency fuel variation covered by AMC6 CAT.OP.MPA.181 and not the planning minima covered by AMC8 CAT.OP.MPA.182 and AMC9 CAT.OP.MPA.182, as variations to the basic fuel schemes, does it need to establish an operational control system that includes flight monitoring?

Yes, we can confirm that an operator will only have to apply the AMC relevant for the variations to the basic fuel scheme that it intends to use. This is explained in detail in GM1 CAT.OP.MPA.180.

In your example, an operator that decides to implement only the variation covered by AMC6 CAT.OP.MPA.181 is not required to include flight monitoring capabilities in its operational control system; flight monitoring capabilities are required only when implementing AMC8 CAT.OP.MPA.182 or AMC9 CAT.OP.MPA.182, or both.

Note: if the operator has decided to implement all the planning minima covered by AMC6 CAT.OP.MPA.182, AMC8 CAT.OP.MPA.182 and AMC9 CAT.OP.MPA.182, on the day of operations the operator can choose any of the three options, depending on which is most favourable (for example, with a marginal weather forecast, the operator may choose the variation covered by AMC6 CAT.OP.MPA.182; or for short-haul flights, the operator may decide to use AMC8 CAT.OP.MPA.182 and for long haul AMC9 CAT.OP.MPA.182).

11. Are flight monitoring capabilities required for basic fuel schemes with variations?



Basic fuel schemes do not require flight monitoring when no variation to the planning minima is used in the aerodrome selection policy.

Variations to the basic fuel schemes in the selection of aerodromes (CAT.OP.MPA.182) regarding the planning minima are methods to reduce the meteorological margins based on the established mitigating measures. The operator should establish an operational control system that includes flight monitoring when applying AMC8 CAT.OP.MPA.182 and/or AMC9 CAT.OP.MPA.182.

The following table provides further clarity on what is required:

<table>
<tr><th></th><th>Operational control</th><th>Fuel consumption monitoring system</th><th>Flight monitoring</th></tr>
<tr><td colspan="4">CAT.OP.MPA.181</td></tr>
<tr><td>Basic fuel scheme (AMC1, AMC2, AMC3, AMC4)</td><td>X</td><td>*</td><td rowspan="3">Depending on the operator's aerodrome selection policy. See below</td></tr>
<tr><td>Basic fuel scheme – Taxi fuel variation (AMC5)</td><td>X</td><td></td></tr>
<tr><td>Basic fuel scheme – contingency fuel variation/s (AMC6)</td><td>X</td><td>X</td></tr>
<tr><td colspan="4">CAT.OP.MPA.182</td></tr>
<tr><td>Basic fuel scheme – isolated aerodrome variation (AMC7)</td><td>X</td><td rowspan="3">Depending on the operator's fuel planning policy. See above</td><td></td></tr>
<tr><td>Basic fuel scheme – planning minima variation (AMC8)</td><td>X</td><td>X</td></tr>
<tr><td>Basic fuel scheme – planning minima variation (AMC9)</td><td>X</td><td>X</td></tr>
</table>

*: CAT.OP.MPA.181(a)(4): requires either a Fuel consumption monitoring system or if not available the use of data provided by the aeroplane manufacturer

12. In the fuel opinion and explanatory notes, the isolated destination aerodrome has been placed in the context of basic fuel schemes with variations. Why are references to isolated destination aerodromes included in AMC5 CAT.OP.MPA.182 and AMC6 CAT.OP.MPA.182, which are dedicated to basic fuel schemes only?

The isolated destination aerodrome is a variation to the basic fuel scheme, covered in AMC7 CAT.OP.MPA.182. To apply this variation, the operator needs to take into account other aspects of the fuel schemes, such as the 'safety margins for meteorological conditions' that should be applied to that isolated aerodrome (e.g., ETA ±1 hour) or the 'planning minima' of such isolated aerodrome. For these matters, the operator usually will follow the requirements for the basic fuel scheme. That is the reason why isolated aerodromes are mentioned in AMCs dedicated to basic fuel schemes.

10 Contact points and acknowledgements:

Please refer to EASA:

- AWO RMT.0379 and SPT.0101 project management Francisco Arenas Alvariño and
- Head of Safety promotion John FRANKLIN.

11 Inspector's checklist for the approval and oversight of Low-visibility operations in accordance with Reg. (EU) 2021/2237.

Checklist low visibility operations/operations with operational credits approval (SA CAT I, CAT II, SA CAT II, CAT II, LVTO with an RVR<400 m)(SPA.LVO)

Operator [1]		
Aircraft type/variant		
Ref.		
Inspectors	**(Name/signature)** [2]	**Date**
Principal Operations Inspector (POI)		
Flight Operations Inspector (FOI)		
Airworthiness Operations Inspector (AWI)		

[2] *By signing this checklist, I hereby confirm that, at the time of performing this activity, I did not have any conflict of interest to declare regarding the above-mentioned operator* [1].

OM amendment information			
Rev. No		**Date**	

List of non-compliances identified			
No	Ref Non-compliance	Ref OM (if applicable)	Non-compliances

List of remarks	
Ref OM	Remarks

Additional notes/comments:

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NA = Not Applicable; C = Compliant; NC = Not Compliant; R = Remark; N/R = Not Reviewed

Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
General						
SPA.LVO.105	Content of the application package: - C/L filled - Aircraft certification evidence, if applicable - FC training programme (OM-D amdt) - Operating procedures (OM-A/B amdt) - MEL amendment, if applicable - Maintenance programme amendment, if applicable - Procedure for the determination of the suitability of aerodromes (OM-A amdt) - Procedure for monitoring of LVO operations/maintenance of performance indicators - Safety assessment - Change management implementation evidence.	ALL	- Check that the application package addresses all the points mentioned. - In case one or several applicable items are not covered, the operator will be asked to complete it to allow the assessment of the application to start.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
ORO.GEN.200(a)(3)	Management of changes / safety risk management	ALL	- Check that the hazard identification process of the operator captured the risks associated with the new type of operations (LVO). - Check the adequate subsequent risk analysis and definition of mitigations. - Check that this was completed in the frame of the operator's management of change process.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Safety assessment - Monitoring, data collection and performance indicators						
Safety assessment						
SPA.LVO.105(g)	Minimum number of approaches/time period: - Sufficient to collect enough data to support the safety assessment - May be reduced in case of multiple application (LVO or operational credit) based on the following similarities:	ALL	- Regarding landing performance, check that the operator has established criteria for successful approach and landing - Check that the data gathered provides for a representative sample of the expected operating conditions.		☐ N/A ☐ C ☐ NC ☐ R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	• Type of technology • Operational procedures • Handling characteristics		(1) for approval of operations with a DH of not less than 50 ft, 30 approaches are recommended; (2) for approval of operations with a DH of less than 50 f, 100 approache are recommended. - Regarding LVTO, review the proposed number of take-offs using the LVTO procedures for the purpose of data gathering		☐ N/R	
SPA.LVO.105(g)	Safety assessment: Prior to commencing LVOs or operations with operational credits, an operator should demonstrate to the competent authority that such operations will achieve an acceptable level of safety. This requires the operator to gather data from operations using the relevant systems and procedures and conduct safety assessments taking that data into account.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.105(g)	Use of data related to another LVO application: If an operator is applying for more than one LVO approval or an approval for operation with operational credits for a particular aircraft type, then data gathered from operations using the systems and procedures designed for one classification of operations or operation with operational credits may be used to support the application for another classification of operations or operation with operational credits provided the following elements are similar: - Type of technology; - Operational procedures; and - handling characteristics.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.105(g)	Use of data from another aircraft type: An operator holding an approval for low-visibility approach operations or operations with operational credits may use data gathered from approaches conducted using one aircraft type to support an application for approval for a different aircraft type or variants provided the following elements are similar: - Type of technology; - Operational procedures; and	CAT II, CAT III, SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	- handling characteristics.					
Monitoring, data collection						
SPA.LVO.105(g)	Monitoring The operator should monitor LVOs and operations with operational credits in order to validate the effectiveness of the applicable aircraft flight guidance systems, training, flight crew procedures, and aircraft maintenance programme, and to identify hazards	ALL	- Regarding landing performance, check that the operator has established criteria for successful approach and landing - Check that sufficient data is recorded to allow the identification of safety hazards.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.105(g)	Data collection: type of data/collection rate: Data should be collected whenever an LVO or an operation with an operational credit is attempted regardless of whether the approach is abandoned, is unsatisfactory, or is concluded successfully. The data should include records of the following: (1) occasions when it was not possible to commence an approach due to deficiencies or unserviceabilities of related airborne equipment; (2) occasions when approaches were discontinued, including the reasons for discontinuing the approach and the height above the runway at which the approach was discontinued; (3) occasions when system abnormalities required pilot intervention to ensure a continued approach or safe landing; (4) landing performance, whether or not the aircraft landed satisfactorily within the desired touchdown area with acceptable lateral velocity or cross-track error. The approximate lateral and longitudinal position of the actual touchdown point in relation to the runway centre line and the runway threshold, respectively, should be recorded.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.105(g)	Data collection means: Data about LVOs should be collected by means of the operator's flight data monitoring programme supplemented by other means including reports submitted by flight crew. Operators that do not have a flight data	ALL			☐ N/A ☐ C ☐ NC ☐ R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	monitoring programme should use reports submitted by flight crew as the primary means of gathering data.				☐ N/R	
Performance indicators						
SPA.LVO.105(g)	Performance indicators should include the following: (1) the rate of unsuccessful low-visibility approaches, i.e. the number of attempted approaches terminating in discontinued approaches, approaches where pilot intervention was required to ensure a continued approach or safe landing or where landing performance was unsatisfactory, compared to the number of low-visibility approaches attempted; (2) measures of performance of the airborne equipment for low-visibility approaches or operations with operational credits; (3) safety performance indicators related to other specific risks associated with LVOs.	CAT II, CAT III, SA CAT I, SA CAT II, EFVS	- check if the operator has defined the means used to determine the rate of unsuccessful low-visibility approaches, and as well the related rate limit. - Check that the operator is using the relevant data at its disposal, and In particular the data gathered via flight crew reports, flight data monitoring or other means, as appropriate (see GM2 SPA.LVO.105(g) for a detailed list of data that may be gathered).		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Records						
SPA.LVO.105(g)	The following information should be retained for at least 5 years: (1) the total number of low-visibility approaches or operations with an operational approval attempted or completed, including practice approaches, by aircraft type; and (2) reports of unsatisfactory approaches and/or landings, by runway and aircraft registration, in the following categories: (i) airborne equipment faults; (ii) ground facility difficulties; (iii) missed approaches because of air traffic control (ATC) instructions; or (iv) other reasons.	CAT II, CAT III, SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Operating minima						
Take-off with visibility conditions of less than 400 m RVR						
SPA.LVO.100(a)	For multi-engined aeroplanes which, in the event of a critical engine failure at any point during take-off, can either stop or continue the take-off to a height of 1 500 ft	LVTO			☐ N/A ☐ C	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	above the aerodrome while clearing obstacles by the required margins, **table 1 of AMC1 SPA.LVO.100(a)** applies				☐ NC ☐ R ☐ N/R	
SPA.LVO.100(a)	For the other multi-engined aeroplanes, there may be a need to land immediately and to see and avoid obstacles. Such aeroplanes may be operated to the take-off minima shown in **Table 2 of AMC1 SPA.LVO.100(a)** and the marking and lighting criteria shown in **Table 1 of AMC1 SPA.LVO.100(a)**, provided that they are able to comply with the applicable obstacle clearance criteria, assuming engine failure at the height specified.	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.100(a)	The reported RVR value representative of the initial part of the take-off run can be replaced by pilot assessment.	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.100(a)	The minimum RVR value specified in **Table 1 or 2 of AMC1 SPA.LVO.100(a)** should be achieved for all reporting points representative of the parts of the runway from the point at which the aircraft commences the take-off until the calculated accelerate-stop distance from that point.	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.100(a)	<u>LVTO - RVR of less than 125 m:</u> the following additional elements should apply: (1) The runway has centre line lights spaced at intervals of 15 m or less; (2) If an ILS signal is used for lateral guidance, the ILS localiser signal meets the requirements for category III operations, unless otherwise stated in the AFM; (3) If an ILS signal is to be used, low-visibility procedures (LVPs) include protection of the runway and, where an ILS localiser signal is used, it should include protection	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	of the ILS-sensitive area unless otherwise stated in the AFM; and (4) If a GLS signal is used for lateral guidance, the GLS performance type meets the requirements for category III operations (GAST D and to GBAS point to which guidance is required), unless otherwise stated in the AFM.					
SPA.LVO.100(a)	LVTO - RVR of less than 125 m: The reported RVR should be not less than the minimum specified in the AFM or, if no such minimum is specified, not less than 75 m.	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.100(a)	LVTO - RVR of less than 125 m: The minimum required RVR should be achieved for all reporting points representative of the parts of the runway from the point at which the aircraft commences the take-off until the greater of the calculated take-off distance or accelerate-stop distance from that point.	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Instrument approach operations in LVO						
SPA.LVO.100(b)	The following should apply for CAT II: (a) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance and be not lower than the highest of: (1) the minimum DH specified in the AFM, if stated; (2) the applicable obstacle clearance height (OCH) for the category of aircraft; (3) the DH to which the flight crew is qualified to operate; or (4) 100 ft. (b) The lowest RVR minima to be used are specified in **Table 4 of AMC1 SPA.LVO.100(b).**	CAT II			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
SPA.LVO.100(b)	The following should apply for CAT III: (a) For operations in which a DH is used, the DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance and be not lower than: (1) the minimum DH specified in the AFM, if stated; (2) the DH to which the flight crew is qualified to operate. (b) Operations with no DH should only be conducted if: (1) operation with no DH is specified in the AFM; (2) there is no published information indicating that the approach aid or aerodrome facilities cannot support operations with no DH; and (3) the flight crew is qualified to operate with no DH. (c) The lowest RVR to be used should be determined in accordance with **Table 5 of AMC2 SPA.LVO.100(b).**	CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.100(b)	Effect on landing minima of temporarily failed or downgraded equipment for approach operations with a DH below 200 ft: - Only those facilities mentioned in **Table 6** of **AMC3 SPA.LVO.100(b).**should be acceptable to be used to determine the effect of temporarily failed of downgraded equipment on the required RVR for CAT II/III approach operations. - The following conditions should be applied to **Table 6**: (1) multiple failures of runway/FATO lights other than those indicated in **Table 6** are not acceptable; (2) failures of approach and runway/FATO lights are acceptable at the same time and the most demanding consequence should be applied; (3) for approach operations with a DH below 200 ft, a combination of deficiencies in runway/FATO lights and RVR assessment equipment are not permitted; and (4) failures other than ILS, GLS and MLS affect the RVR only and not the DH.	CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
Operations with operational credits						
SPA.LVO.100(c)	Effect on landing minima of temporarily failed or downgraded equipment for approach operations with a DH below 200 ft: **Table 7 of AMC1 SPA.LVO.100(b) applies.**	SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.100(c)	(a) The DH of an SA CAT I operation should not be lower than the highest of: (1) the minimum DH specified in the AFM, if stated; (2) the applicable OCH for the category of aeroplane; (3) the DH to which the flight crew is qualified to operate; or (4) 150 ft. (b) Where the DH for an SA CAT I operation is less than 200 ft, it should be determined by the use of a radio altimeter or other device capable of providing equivalent performance. (c) The following visual aids should be available: (1) approach lights as specified in **Table 8 of AMC1 SPA.LVO.100(c);** (2) precision approach (PA) runway markings; (3) category I runway lights. (d) The lowest RVR should not be lower than the higher of: (1) the minimum RVR specified in the AFM, if stated; or (2) the RVR specified in **Table 8.**	SA CAT I			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.100(c)	The following should apply: (a) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process, and be not lower than the highest of: (1) the minimum DH specified in the AFM, if stated; (2) the applicable OCH for the category of aeroplane; (3) the DH to which the flight crew is qualified to operate; or (4) 100 ft.	SA CAT II			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(b) The following visual aids should be available: (1) approach lights as specified in **Table 9 of AMC2 SPA.LVO.100(c)**; (2) precision approach runway markings; (3) category I runway lights. (c) The lowest RVR minima to be used are specified in **Table 9**.					
	When conducting EFVS operations to a runway: (a) the DA/H used should be the same as for operations without EFVS; (b) the lowest RVR minima to be used should be determined: (1) in accordance with criteria specified in the AFM for the expected weather conditions; or (2) if no such criteria are specified, by reducing the RVR determined for operation without the use of EFVS/CVS in accordance with **Table 10 of AMC3 SPA.LVO.100(c)**; (c) where the lowest RVR to be used, determined in accordance with (b), is less than 550 m, then this should be increased to 550 m unless LVPs are established at the aerodrome of intended landing; (d) where the EFVS is part of a CVS, it is only the EFVS element that should provide the operational credits. The other part of the CVS, the synthetic vision system (SVS), should not provide operational credits.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Aircraft certification						
SPA.LVO.105(a)	Aircraft used for LVTO in an RVR of less than 125 m should be equipped with a system certified for the purpose.	LVTO	The kind of systems in use today includes paravisual display (PVD) and HUD.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.105(a)	Aircraft used for low-visibility approach operations should be equipped in accordance with the applicable airworthiness requirements and certified as follows:	CAT II, CAT III, SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(1) For CAT II operations, the aircraft should be certified for CAT II operations. (2) For CAT III operations, the aircraft should be certified for CAT III operations. (3) For SA CAT I, the aircraft should be certified for SA CAT I operations. (4) For SA CAT II, the aircraft should be certified for CAT II operations and be equipped with HUDLS or fail-passive autoland or better. (5) For EFVS operations, the aircraft should be equipped with a certified EFVS-A or EFVS-L.				☐ NC ☐ R ☐ N/R	
Flight crew competency						
SPA.LVO.120(a)	Risk assessment: To ensure that the flight crew is competent to conduct the intended operations, the operator should assess the risks associated with the conduct of low-visibility approach operations by pilots new to the aircraft type or class and take the necessary mitigations. Where such mitigations include an increment to the visibility or RVR for LVOs, this should be stated in the operations manual.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Recent experience						
SPA.LVO.120(a)	Recent experience for SA CAT I, CAT II, SA CAT II and CAT III: - At least **two approaches** using the operator's procedures for low-visibility approach operations or operations with operational credits, during the validity period of each OPC or periodic demonstration of competence, unless credits related to recent experience when operating more than one type are defined in the OSD.	SA CAT I, CAT II, SA CAT II, CAT III	- Approaches conducted in a suitably qualified FSTD and/or during a proficiency check or demonstration of competence may be counted towards the recent experience requirements		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(a)	Recent experience for SA CAT I, CAT II, SA CAT II and CAT III: For operators approved for more than one piece of aircraft equipment used (e.g. autoland, HUD, auto-coupled approach with manual landing, SVGS, etc.): - at least **one additional approach** in the lowest approved RVR (either to go-around or landing) for each piece of aircraft equipment used during the validity period of each OPC or periodic demonstration	SA CAT I, CAT II, SA CAT II, CAT III	- Approaches conducted in a suitably qualified FSTD and/or during a proficiency check or demonstration of competence may be counted towards the recent experience requirements		☐ N/A ☐ C ☐ NC ☐ R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	of competence (e.g. two approaches CAT II with autoland and one CAT II with auto-coupled to below DH with manual landing, two CAT II autoland and one CAT II HUD to below DH with manual landing or vice versa) unless credits related to recent experience when operating more than one type are defined in the OSD.				☐ N/R	
SPA.LVO.120(a)	<u>Recent experience for SA CAT I, CAT II, SA CAT II and CAT III:</u> Pilots authorised to conduct low-visibility approach operations or operations with operational credits using HUDLS or equivalent display systems to touchdown: - **two approaches** (e.g. an operator approved for CAT II/III HUDLS will do two CAT III HUDLS; other examples would be two CAT III autoland and two CAT III HUDLS to touchdown, two SA CAT II autoland and two SA CAT II HUDLS, or when combining several LVOs and equipment, two CAT III autoland and one CAT II auto-coupled to below DH with manual landing and two CAT III HUDLS to touchdown) using the operator's procedures for low-visibility approach operations or operations with operational credits using HUDLS, during the validity period of each OPC or periodic demonstration of competence unless credits related to recent experience when operating more than one type are defined in the OSD.	SA CAT I, CAT II, SA CAT II, CAT III	- Approaches conducted in a suitably qualified FSTD and/or during a proficiency check or demonstration of competence may be counted towards the recent experience requirements		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(a)	<u>Recent experience for EFVS:</u> Pilots should complete a minimum of **two approaches** on each type of aircraft operated using the operator's procedures for EFVS operations during the validity period of each OPC or periodic demonstration of competence unless credits related to recent experience when operating more than one type are defined in the OSD. When the operator is approved for both EFVS-L and EFVS-A, a minimum of one approach in each EFVS operation should be completed.	EFVS	- Approaches conducted in a suitably qualified FSTD and/or during a proficiency check or demonstration of competence may be counted towards the recent experience requirements		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
SPA.LVO.120(a)	PF and PNF: If a flight crew member is authorised to operate as pilot flying and pilot monitoring, the flight crew member should complete the required number of approaches in each operating capacity.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Initial training and checking						
SPA.LVO.120(b)	LVTO: The operator should ensure that the flight crew members have completed: - a ground training course - a course of FSTD/flight training covering system failures and engine failures resulting in continued as well as rejected take-offs unless credits related to training and checking for previous experience in LVTOs on similar aircraft types are defined in the operational suitability data established in accordance with Regulation (EU) No 748/2012	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	SA CAT I, CAT II, SA CAT II and CAT III: The operator should ensure that the flight crew members have completed: - a ground training course - a course of FSTD and/or flight training - a check, if applicable - practice approaches during LIFUS, if applicable. unless credits related to training and checking for previous experience on similar aircraft types are defined in the OSD.	SA CAT I, CAT II, SA CAT II, CAT III, EFVS				
LVTO initial training and checking						
SPA.LVO.120(b)	LVTO ground course: The ground training course should include at least the following: (1) characteristics of fog;	LVTO			☐ N/A ☐ C ☐ NC	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(2) effects of precipitation, ice accretion, low-level wind shear and turbulence; (3) the effect of specific aircraft/system malfunctions; (4) the use and limitations of RVR assessment systems; (5) procedures to be followed and precautions to be taken with regard to surface movement during operations when the RVR is 400 m or less and any additional procedures required for take-off in conditions below 150 m; (6) qualification requirements for pilots to obtain and retain approval to conduct LVOs; and (7) the importance of correct seating and eye position.				☐ R ☐ N/R	
SPA.LVO.120(b)	LVTO FSTD/flight training: The FSTD/flight training should include at least the following: (1) normal take-off in minimum approved RVR conditions; (2) take-off in minimum approved RVR conditions with an engine failure: (i) for aeroplanes, between V1 and V2 (take-off safety speed) or as soon as safety considerations permit; (ii) for helicopters, at or after the take-off decision point (TDP); and (3) take-off in minimum approved RVR conditions with an engine failure: (i) for aeroplanes, before V1 resulting in a rejected take-off; and (ii) for helicopters, before the TDP.	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	LVTO with an RVR below 150 m: The operator approved for LVTOs with an RVR below 150 m should ensure that the FSTD/flight training is carried out in an FSTD. This training should include the use of any special procedures and equipment.	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	LVTO with an RVR below 150 m:	LVTO			☐ N/A ☐ C	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	The operator should ensure that a flight crew member has completed a check before conducting LVTOs in RVRs of less than 150 m. The check should require the execution of: (1) at least one LVTO in the minimum approved visibility; (2) at least one rejected take-off at minimum approved RVR in an aircraft or FSTD. For pilots with previous experience with an EU operator of LVTOs in RVRs of less than 150 m, the check may be replaced by successful completion of the FSTD and/or flight training.				☐ NC ☐ R ☐ N/R	
SA CAT I, CAT II, SA CAT II and CAT III initial training and checking (FC <u>with no</u> previous LVO experience with an EU operator)						
SPA.LVO.120(b)	<u>Ground training:</u> The ground training should include at least the following: (i) characteristics and limitations of different types of approach aids; (ii) characteristics of the visual aids; (iii) characteristics of fog; (iv) operational capabilities and limitations of airborne systems to include symbology used on HUD/HUDLS or equivalent display systems, if appropriate; (v) effects of precipitation, ice accretion, low level wind shear and turbulence; (vi) the effect of specific aircraft/system malfunctions; (vii) the use and limitations of RVR assessment systems; (viii) principles of obstacle clearance requirements; (ix) the recognition of failure of ground equipment or in satellite approaches, the loss of signal in space and the action to be taken in the event of such failures; (x) procedures to be followed and precautions to be taken with regard to surface movement during operations when the RVR is 400 m or less and any additional procedures required for take-off in conditions below 150 m; (xi) the significance of DHs based upon radio altimeters and the effect of terrain profile in the approach area on radio altimeter readings and on automatic approach/landing	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	systems. This applies also to other devices capable of providing equivalent information; (xii) the effect of the pre-threshold terrain and LSAA on airborne landing systems; (xiii) the significance of alert height, if applicable, and action in the event of any failure above and below the alert height; (xiv) qualification requirements for pilots to obtain and retain approval to conduct LVOs; (xv) the importance of correct seating and eye position; and (xvi) the significance of LVPs or equivalent procedures.					
SPA.LVO.120(b)	Phase **one** of FSTD training and/or flight training: The training should include at least the following: (A) approaches with engine failures at various stages of the approach; (B) approaches with critical equipment failures, such as electrical systems, auto-flight systems, ground or airborne approach aids and status monitors; (C) approaches where failures of auto-flight or flight guidance systems, including HUDLS or equivalent display systems, require either: (a) reversion to manual control for landing or go-around; or (b) reversion to manual control or a downgraded automatic mode control for go-around from the DH or below, including those which may result in contact with the runway. This should include aircraft handling if, during a CAT III fail-passive approach, a fault causes autopilot to disconnect at or below the DH when the last reported RVR is 300 m or less; (D) failures of systems that will result in excessive lateral or vertical deviation both above and below the DH in the minimum visual conditions for the operation; (E) incapacitation procedures appropriate to low-visibility approach operations; and (F) failures and procedures applicable to the specific aircraft type.	SA CAT I, CAT II, SA CAT II, CAT III	- Check also that the objectives of the training are clearly stated and meet the criteria of para (a)(2)(iii) of AMC2 SPA.LVO.120(b).		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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SPA.LVO.120(b)	Phase **two** of FSTD training and/or flight training: The training should include at least the following: (A) the required checks for satisfactory functioning of equipment, both on the ground and in flight; (B) the use of HUD/HUDLS or equivalent display systems during all phases of flight, if applicable; (C) approach using the appropriate flight guidance, autopilots, and control systems installed on the aircraft to the appropriate DH and transition to visual flight and landing; (D) approach with all engines operating using the appropriate flight guidance, autopilots and control systems installed on the aircraft, including HUD/HUDLS or equivalent display systems, down to the appropriate DH followed by a missed approach, all without external visual reference; (E) where appropriate, approaches using autopilot to provide automatic flare, hover, landing and roll-out; and (F) where appropriate, approaches using approved HUD/HUDLS or equivalent display system to touchdown.	SA CAT I, CAT II, SA CAT II, CAT III	- Check also that the objectives of the training are clearly stated and meet the criteria of para (a)(2)(i) of AMC2 SPA.LVO.120(b).		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	FSTD training and/or flight: FSTD training should include: (A) for approaches flown using HUDLS or equivalent display systems, a minimum of **eight approaches**; (B) otherwise, a minimum of **six approaches**.	SA CAT I, CAT II, SA CAT II, CAT III	- Check that the operator's procedure allows the possibility of additional approaches to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	FSTD training and/or flight training: For aircraft for which no FSTDs representing the specific aircraft are available, operators should ensure that the flight training phase specific to the visual scenarios of low-visibility approach operations is conducted in a specifically approved FSTD. Such training should include a minimum of **four approaches.** Thereafter, type-specific training should be conducted in the aircraft.	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
SPA.LVO.120(b)	Check: The check should comprise the completion of the following exercises in an aircraft or FSTD: (i) Low-visibility approaches in simulated instrument flight conditions down to the applicable DH, using the flight guidance system. Standard procedures of crew coordination (task sharing, call-out procedures, mutual surveillance, information exchange and support) should be observed. For CAT III operations, the operator should use an FSTD approved for this purpose; (ii) Go-around after approaches as in the FSTD/aircraft training at any point between 500 ft above ground level (AGL) and on reaching the DH; and (iii) Landing(s) with visual reference established at the DH following an instrument approach. Depending on the specific flight guidance system, an automatic landing should be performed.	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	LIFUS (when applicable): The check should comprise the completion of the following exercises in an aircraft or FSTD: (i) For low-visibility approach operations using a manual landing: (A) if a HUDLS or equivalent display system is used to touchdown, **four landings**, or if the required FSTD training was conducted in an FSTD qualified for zero flight-time training (ZFTT), **two landings**; (B) otherwise, **three landings**, or if the required FSTD training was conducted in an FSTD qualified for ZFTT, one landing; (ii) For low-visibility operations using autoland: (A) if the required FSTD training was conducted in an FSTD qualified for ZFTT, **one landing**, or none if the fight crew member successfully completed a type rating based on ZFTT; (B) otherwise, **two landings**.	SA CAT I, CAT II, SA CAT II, CAT III	- Check that the operator's procedure allows the possibility of additional landings to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SA CAT I, CAT II, SA CAT II and CAT III initial training and checking (FC with previous LVO experience with an EU operator, when changing to an aircraft for which a new class or type rating is required, within the same operator)						

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SPA.LVO.120(b)	Ground training: The content of the ground course should cover all the elements of the ground course for FC with no LVO experience, taking into account the flight crew member's existing knowledge of low-visibility approach operations.	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	FSTD and/or flight training: The content of the FSTD and/or flight training should cover all the elements of the related course for FC with no LVO experience. If the FC's previous experience of low-visibility approach operations is on a type where the following were the same or similar: (i) the technology used in the flight guidance and flight control system; (ii) operating procedures; (iii) handling characteristics; and (iv) the use of HUD/HUDLS or equivalent display systems, then the flight crew member may complete an abbreviated course of FSTD and/or flight training.	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	Abbreviated course of FSTD and/or flight training: Such an abbreviated course should: - meet the objectives of the related course for FC with no experience and - include at least the following number of landings: (A) if a HUDLS or an equivalent display system is utilised to touchdown, **four approaches** including a landing at the lowest approved RVR and a go-around; or (B) otherwise, **two approaches** including a landing at the lowest approved RVR and a go-around.	SA CAT I, CAT II, SA CAT II, CAT III	- Check that the operator's procedure allows the possibility of additional approaches to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SA CAT I, CAT II, SA CAT II and CAT III initial training and checking (FC with previous LVO experience with an EU operator, when joining another operator)						

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
SPA.LVO.120(b)	Ground training: The content of the ground course should cover all the elements of the ground course for FC with no LVO experience, taking into account the flight crew member's existing knowledge of low-visibility approach operations.	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	FSTD and/or flight training: The content of the FSTD and/or flight training should cover all the elements of the related course for FC with no LVO experience. If the FC's previous experience of low-visibility approach operations is on the same aircraft type and variant, or on a different type or variant where the following were the same or similar: (i) the technology used in the flight guidance and flight control system; (ii) operating procedures; (iii) handling characteristics; and (iv) the use of HUD/HUDLS or equivalent display systems, then the flight crew member may complete an abbreviated course of FSTD and/or flight training.	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	Abbreviated course of FSTD and/or flight training: Such an abbreviated course should: - meet the objectives of the related course for FC with no experience and - include at least the following number of landings: (A) if a HUDLS or an equivalent display system is utilised to touchdown, **four approaches** including a landing at the lowest approved RVR and a go-around; or (B) otherwise, **two approaches** including a landing at the lowest approved RVR and a go-around.	SA CAT I, CAT II, SA CAT II, CAT III	- Check that the operator's procedure allows the possibility of additional approaches to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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SPA.LVO.120(b)	LIFUS : Practice in approaches during LIFUS as required for FC with no experience unless the flight crew member's previous experience of low-visibility approach operations is on the same aircraft type and variant.	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
EFVS initial training and checking (for FC with no previous experience with an EU operator)						
SPA.LVO.120(b)	Ground training : The ground training should include at least the following: (i) characteristics and limitations of HUDs/HUDLSs or equivalent display systems including information presentation and symbology; (ii) EFVS sensor performance, sensor limitations, scene interpretation, visual anomalies and other visual effects; (iii) EFVS display, control, modes, features, symbology, annunciations and associated systems and components; (iv) the interpretation of EFVS imagery; (v) the interpretation of approach and runway lighting systems and display characteristics when using EFVS; (vi) weather associated with low-visibility conditions and its effect on EFVS performance; (vii) pre-flight planning and selection of suitable aerodromes and approach procedures; (viii) principles of obstacle clearance requirements; (ix) the use and limitations of RVR assessment systems; (x) normal, abnormal and emergency procedures for EFVS operations; (xi) the effect of specific aircraft/system malfunctions; (xii) procedures to be followed and precautions to be taken with regard to surface movement during operations when the RVR is 400 m or less; (xiii) for EFVS-L, the effect of the pre-threshold terrain and LSAA on airborne landing systems; (xiv) human factors aspects of EFVS operations; (xv) qualification requirements for pilots to obtain and retain approval for EFVS operations; and	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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	(xvi) the significance of LVPs or equivalent procedures when operating below RVR 550 m.					
SPA.LVO.120(b)	**Phase one** of FSTD and/or flight training: Phase one of the training should include the following exercises: (A) the required checks for satisfactory functioning of equipment, both on the ground and in flight; (B) the use of HUD/HUDLS or equivalent display systems during all phases of flight; (C) approach using the EFVSs installed on the aircraft to the appropriate DH and transition to visual flight and landing; (D) approach with all engines operating using the EFVS, down to the appropriate DH followed by a missed approach, all without external visual reference; (E) where appropriate, approaches using approved EFVS to touchdown.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	**Phase two** of FSTD and/or flight training: Phase two of the training should include the following exercises: (A) approaches with engine failures at various stages of the approach; (B) approaches with failures of the EFVS at various stages of the approach, including failures between the DH and the height below which an approach should not be continued if natural visual reference is not acquired, requiring either: (a) reversion to head-down displays to control missed approach; or (b) reversion to flight with no, or downgraded, guidance to control missed approaches from the DH or below, including those which may result in a touchdown on the runway; (C) incapacitation procedures appropriate to EFVS operations; and (D) failures and procedures applicable to the specific EFVS installation and aircraft type.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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SPA.LVO.120(b)	FSTD and/or flight training: FSTD training should include a minimum of **eight approaches.** If a flight crew member is to be authorised to operate as pilot flying and pilot monitoring during EFVS operations, then the flight crew member should complete the required FSTD training for each operating capacity.	EFVS	- Check that the operator's procedure allows the possibility of additional approaches to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	LIFUS (if applicable): LIFUS should include practice in approaches as follows: (i) if EFVS is used to touchdown, **four landings**; or (ii) otherwise, **three landings**.	EFVS	- Check that the operator's procedure allows the possibility of additional landings to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
EFVS initial training and checking (FC with previous LVO experience with an EU operator, when changing to an aircraft for which a new class or type rating is required, within the same operator)						
SPA.LVO.120(b)	Ground training: The content of the ground course should cover all the elements of the ground course for FC with no EFVS experience, taking into account the flight crew member's existing knowledge of low-visibility approach operations.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	FSTD and/or flight training: The content of the FSTD and/or flight training should cover all the elements of the related course for FC with no EFVS experience. If the FC's previous experience of low-visibility approach operations is on a type where the following were the same or similar: (i) the technology used in the EFVS sensor, flight guidance and flight control system; (ii) operating procedures; and (iii) handling characteristics; and (	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	then the flight crew member may complete an abbreviated course of FSTD and/or flight training.					
SPA.LVO.120(b)	Abbreviated course of FSTD and/or flight training: Such an abbreviated course should: - meet the objectives of the related course for FC with no EFVS experience and - include at least the following number of landings: (A) for EFVS to touchdown, **four approaches** including a landing at the lowest approved RVR and a go-around; or (B) otherwise, **two approaches** including a landing at the lowest approved RVR and a go-around.	EFVS	- Check that the operator's procedure allows the possibility of additional approaches to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
EFVS initial training and checking (FC with previous LVO experience with an EU operator, when joining another operator)						
SPA.LVO.120(b)	Ground training: The content of the ground course should cover all the elements of the ground course for FC with no EFVS experience, taking into account the flight crew member's existing knowledge of low-visibility approach operations.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	FSTD and/or flight training: The content of the FSTD and/or flight training should cover all the elements of the related course for FC with no EFVS experience. If the FC's previous experience of low-visibility approach is on the same aircraft type and variant with the same EFVS or on a different type or different EFVS where the following were the same or similar: (i) the technology used in the EFVS sensor, flight guidance and flight control system; (ii) operating procedures; and (iii) handling characteristics; and (	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	then the flight crew member may complete an abbreviated course of FSTD and/or flight training.					
SPA.LVO.120(b)	Abbreviated course of FSTD and/or flight training: Such an abbreviated course should: - meet the objectives of the related course for FC with no EFVS experience and - include at least the following number of landings: (A) for EFVS to touchdown, **four approaches** including a landing at the lowest approved RVR and a go-around; or (B) otherwise, **two approaches** including a landing at the lowest approved RVR and a go-around.	EFVS	- Check that the operator's procedure allows the possibility of additional approaches to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	LIFUS: LIFUS should include practice in approaches as follows: (i) if EFVS is used to touchdown**, four landings**; or (ii) otherwise, **three landings**; unless the flight crew member's previous experience of low-visibility approach operations is on the same aircraft type and variant.	EFVS	- Check that the operator's procedure allows the possibility of additional landings to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Recurrent checking/Differences training						
SPA.LVO.120(b)	Recurrent checking for LVTO : The operator should ensure that the pilots' competence to perform LVTOs for which they are authorised is checked by completing at least the following exercises: (1) One or more low-visibility rejected take-off at minimum approved RVR at least once over the period between two operator proficiency checks or once at every periodic demonstration of competence or, for an ATQP operator, at each required operator proficiency check or alternatively at each required LOE. (2) Pilots authorised for LVTO operations in an RVR of less than 150 m should additionally conduct at least one LVTO in the minimum approved visibility at each required operator proficiency check or periodic demonstration of competence.	LVTO			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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SPA.LVO.120(b)	Recurrent checking for SA CAT I, CAT II, SA CAT II, CAT III : The operator should ensure that the pilots' competence to perform LVOs for which they are authorised is checked by completing at least the following exercises: (1) One or more low-visibility approaches in simulated instrument flight conditions down to a point between 500 ft AGL and the threshold (e.g. applicable DH), followed by go-around, at each required operator proficiency check or periodic demonstration of competence; and (2) One or more low-visibility approach and landings with visual reference established at the DH at each required operator proficiency check or periodic demonstration of competence.	SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	Recurrent checking for CAT III : Pilots authorised to conduct CAT III operations on aircraft with a fail-passive autoland system, or HUDLS or equivalent, should complete a missed approach at least once over the period of three consecutive OPCs or demonstrations of competence as the result of an equipment failure at or below the DH when the last reported RVR was less than 300 m. For ATQP operators, pilots authorised to conduct CAT III operations on aircraft with a fail-passive autoland system, or HUDLS or equivalent, should complete a missed approach at least once every two OPCs or LOE (a period of about 2 years).	CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	Use of FSTD for recurrent checking I : CAT III approach operations should be conducted in an FSTD. Other exercises may be conducted in an FSTD or aircraft.	LVTO, SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	Differences training for LVTO, SA CAT I, CAT II, SA CAT II, CAT III :	LVTO, SA CAT I, CAT II, SA CAT II, CAT III			☐ N/A ☐ C	

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	A differences training or familiarisation should be provided to FC when not already authorized for the related LVO, or whenever there is a change to any of the following: (1) the technology used in the flight guidance and flight control system; (2) the operating procedures including: (i) fail-passive/fail-operational; (ii) alert height; (iii) manual landing or automatic landing; (iv) operations with DH or no DH operations; (3) the handling characteristics; (4) the use of HUD/HUDLS or equivalent display systems; (5) the use of EFVS.				☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	Recurrent checking for EFVS : The operator should ensure that the pilots' competence to perform EFVS operations is checked at each required demonstration of competence or OPC by performing at least **two approaches** of which one should be flown without natural vision, to the height below which an approach should not be continued if natural visual reference is not acquired.	EFVS	- Check that the operator's procedure allows the possibility of additional approaches to achieve the required proficiency.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	Recurrent checking for EFVS : If a flight crew member is authorised to operate as pilot flying and pilot monitoring during EFVS operations, then the flight crew member should complete the required number of approaches in each operating capacity.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.120(b)	Differences training for EFVS : (a) A differences training or familiarisation should be provided to FC whenever there is a change to any of the following: (1) the technology used in the EFVS sensor, flight guidance and flight control system; (2) the operating procedures; (3) the handling characteristics; (b) The differences training should:	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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	(1) meet the objectives of the appropriate initial training course; (2) take into account the flight crew members' previous experience; and (3) take into account the operational suitability data established in accordance with Regulation (EU) No 748/2012.					
Operating procedures						
General						
SPA.LVO.105(c)	Prior to commencing an LVO, the pilot-in-command/commander should be satisfied that: (a) the status of visual and non-visual facilities is as required; (b) if LVPs are required for such operations, LVPs are in effect; and (c) the flight crew members are appropriately qualified.	ALL	- Check that these conditions are reflected in the operator's procedures.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.105(c)	Operating procedures should be established for all types of LVOs and operations with operational credits for which an operator is seeking approval. The operating procedures should: (1) be consistent with the AFM; (2) be appropriate to the technology and equipment to be used; (3) specify the duties and responsibilities of each flight crew member in each relevant phase of flight; (4) ensure that flight crew workload is managed to facilitate effective decision-making and monitoring of the aircraft; and (5) minimise, as much as practical, the deviation from normal procedures used for routine operations (non-LVOs).	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.105(c)	Operating procedures should include: (1) the required checks for the satisfactory functioning of the aircraft equipment, both before departure and in flight; (2) the correct seating and eye position; (3) determination of aerodrome operating minima;	ALL			☐ N/A ☐ C ☐ NC ☐ R	

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	(4) the increment to be added to minima for use by pilots-in-command/commanders who are new to the aircraft type, if applicable; (5) the effect on aerodrome operating minima of temporarily failed or downgraded ground equipment; (6) the effect on aerodrome operating minima of the failure or change of the status of any aircraft systems; (7) when the LVPs at the aerodrome are required. LVPs are required: (i) for low-visibility flight approach operations; (ii) for LVTOs with RVR less than 400 m. (8) a requirement for an 'approaching minima' call-out to prevent inadvertent descent below the DA/H; (9) the requirement for height call-outs below 200 ft to be based on the use of a radio altimeter or other device capable of providing equivalent performance, if applicable; (10) the required visual references; (11) the action to be taken in the event of loss of the required visual references; and (12) the maximum allowable flight path deviations and action to be taken in the event that such deviations occur.				☐ N/R	
SPA.LVO.105(c)	Operations procedures should be included in the operator's operations manual	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
CAT II						
SPA.LVO.105(c)	The following should apply: (a) The flight crew should consist of at least two pilots. (b) The approach should be flown using a certified system as identified in the AFM.	CAT II			☐ N/A ☐ C ☐ NC ☐ R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(c) If the approach is flown using autopilot, for a manual landing the autopilot should remain engaged until after the pilot has achieved visual reference. (d) All height call-outs below 200 ft above the runway threshold elevation should be determined by the use of a radio altimeter or other device capable of providing equivalent performance. (e) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process. (f) At DH, the following visual references should be distinctly visible and identifiable to the pilot: (1) a segment of at least three consecutive lights, which are the centre line of the approach lights or TDZ lights or runway centre line lights or edge lights or a combination of these; and (2) a visual reference that should include a lateral element of the ground pattern, such as an approach lighting crossbar, or the landing threshold, or a barrette of the TDZ lighting unless the operation is conducted using a HUD or an equivalent system to touchdown.				☐ N/R	
CAT III						
SPA.LVO.105(c)	The following should apply: (a) The flight crew should consist of at least two pilots. (b) The approach should be flown using a certified system as identified in the AFM. (c) All height call-outs below 200 ft above the runway threshold elevation should be determined by the use of a radio altimeter or other device capable of providing equivalent performance. (d) For operations in which a DH is used, the DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process. (e) At DH, the following visual references should be distinctly visible and identifiable to the pilot:	CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(1) for operations conducted either with fail-passive flight control systems or with the use of an approved HUD or equivalent display system: a segment of at least three consecutive lights, which are the centre line of the approach lights, or TDZ lights, or runway centre line lights, or runway edge lights, or a combination of these; and (2) for operations conducted either with fail-operational flight control systems or with a fail-operational hybrid landing system using a DH: at least one centre line light to be attained and maintained by the pilot. (f) For operations with no DH, there is no specification for visual reference with the runway prior to touchdown.					
SA CAT I						
SPA.LVO.105(c)	The following should apply: (a) The approach should be flown using a certified system as identified in the AFM. (b) All height call-outs below 200 ft above the runway threshold elevation should be determined by the use of a radio altimeter or other device capable of providing equivalent performance. (c) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process. (d) At DH the following visual references should be visible to the pilot: (1) a segment of at least three consecutive lights, which are the centre line of the approach lights, or TDZ lights, or runway centre line lights, or runway edge lights, or a combination of these; and (2) a visual reference that should include a lateral element of the ground pattern, such as an approach lighting crossbar, or the landing threshold, or a barrette of the TDZ lighting unless the operation is conducted utilising an approved HUD or an equivalent	SA CAT I			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	system usable down to 120 ft above the runway threshold.					
SA CAT II						
SPA.LVO.105(c)	The following should apply: (a) The flight crew should consist of at least two pilots. (b) The approach should be flown using a certified HUDLS or autoland system as identified in the AFM. (c) All height call-outs below 200 ft above the runway threshold elevation should be determined by the use of a radio altimeter or other device capable of providing equivalent performance. (d) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process. (e) At DH the visual references should be distinctly visible and identifiable to the pilot: (1) a segment of at least three consecutive lights, which are the centre line of the approach lights or TDZ lights, or runway centre line lights, or runway edge lights or a combination of these; (2) a visual reference that should include a lateral element of the ground pattern, such as an approach lighting crossbar, or the landing threshold, or a barrette of the TDZ lighting.	SA CAT II			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
EFVS						
SPA.LVO.105(c)	For EFVS operations to a runway, the following should apply: (a) The approach should be flown using a certified EFVS-A or EFVS-L as identified in the AFM. (b) The pilot flying should use the EFVS throughout the approach. (c) In multi-pilot operations, the pilot monitoring should monitor the EFVS-derived information. (d) The approach between the final approach fix (FAF) and the DA/H should be flown using vertical flight path guidance mode (e.g. flight director)	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(e) The approach may be continued below the DA/H provided that the pilot can identify on the EFVS image either: (1) the approach light system; or (2) both of the following: (i) the runway threshold identified by the beginning of the runway landing surface, the threshold lights or the runway end identifier lights; and (ii) the TDZ identified by the TDZ lights, the TDZ runway markings or the runway edge lights. (f) Unless the aircraft is equipped with a certified EFVS-L, a missed approach should be executed promptly if the required visual reference is not distinctly visible and identifiable to the pilot without reliance on the EFVS by the following height above the threshold: (1) the height below which an approach should not be continued if natural visual reference is not acquired by the crew as stated in the AFM; or (2) if the AFM does not specify such a height, 100 ft.					
MEL amendment						
SPA.LVO.105(d)	The MEL should be amended, if applicable, to reflect the related intended LVO operations.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Maintenance programme						
SPA.LVO.105(e)	The maintenance programme should be amended, if applicable.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Suitability of aerodromes						

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
SPA.LVO.110	Assessment of the suitability of aerodromes: The assessment should cover the assessment of availability of: (1) suitable navigation facilities and associated instrument flight approach procedures; (2) suitable aerodrome operating procedures, including LVPs, and the compatibility with the intended aircraft operations; and (3) suitable runway and runway environment characteristics and facilities.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Methodology for the assessment of the suitability of aerodromes: Assessment to be made using one or a combination of the following methods: - Assessment of previous operational data for the particular aerodrome - Desktop assessment of the: • Aerodrome data • Instrument flight procedure • Aircraft data and capability - Operational assessment: To be used if the suitability of the aerodrome for the intended operations could not be positively assessed by means of the other methods.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Assessment of previous operational data						
SPA.LVO.110	Source of the data: The data should come from: (1) the operator itself, or when not available; (2) the following entities: (i) the State of the aerodrome or the competent authority issuing the operator's LVO approval; (ii) the type certificate holder of the aircraft; or (iii) other operators.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Use of previous operational data: Previous operational data should only be used if: (1) it concerns the same runway and there were no relevant changes to the runway and runway environment; (2) it is derived in accordance with **Table 14 of AMC1 SPA.LVO.110** for the intended operation; and	ALL			☐ N/A ☐ C ☐ NC ☐ R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(3) there is no safety concern for such operation.				☐ N/R	
SPA.LVO.110	Crediting of previous operational data: Previous operational data may be credited to an aircraft if it is from: (1) the same aircraft make and model, unless the credit from the same aircraft make and model is restricted by any of the following entities: (i) the State of the aerodrome or the competent authority issuing the operator's LVO approval; (ii) the type certificate holder of the aircraft; or (iii) other operators. or (2) another aircraft model, if stated in the AFM or additional data from the TC/STC holder.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Desktop assessment – aerodrome data, instrument flight procedure and aircraft data and capabilities						
SPA.LVO.110	General: The desktop assessment should correspond to the nature and complexity of the operation intended to be carried out and should take into account the hazards and associated risks inherent in these operations.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Data to be included: The assessment should include the AFM or additional data from the TC/STC holder, instrument flight procedures and aerodrome data. Additional elements may need to be included in the assessment if stated by: (1) the AFM, or additional data from the TC/STC holder; or (2) the State of the aerodrome or AIP data; or (3) the competent authority issuing the operator's LVO approval.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Data to be included: For landing systems, the runway or airport conditions should include as a minimum: (1) the approach path slope;	CAT II, CAT III, SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(2) the runway elevation; (3) the type of xLS navigation means intended to be used; (4) the average slope of the LSAA; and (5) the ground profile under the approach path (pre-threshold terrain). The distance should be calculated from the published threshold. It should be 300 metres, unless otherwise stated by the AFM or additional data from the TC/STC holder, the State of the aerodrome or AIP data, or the competent authority issuing the operator's LVO approval.				☐ NC ☐ R ☐ N/R	
SPA.LVO.110	If the system used to perform an EFVS operation contains a flare cue, each aircraft type/equipment/runway combination should be verified before authorising the use of EFVS-L, on any runway with irregular pre-threshold terrain (not within the certification assumption for pre-threshold terrain), if the LSAA presents significant slope change.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	<u>Suitable instrument flight approach procedures:</u> (a) CAT II instrument approach operations should only be conducted using a CAT II IAP. (b) CAT III instrument approach operations should only be conducted using a CAT III IAP. (c) SA CAT I operations should only be conducted using a SA CAT I IAP or, if not available, a CAT I IAP that includes an OCH based on radio altimeter. (d) SA CAT II operations should only be conducted using a SA CAT II IAP or, if not available, a CAT II IAP. (e) EFVS operations should only be conducted using an IAP which is offset by a maximum of 3 degrees unless a different approach offset is stated in the AFM.	CAT II, CAT III, SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	<u>Suitable aerodrome : runway and runway environment - navigations facilities:</u> For CAT II instrument approach operations, a PA runway category II or category III should be used. The following visual aids should be available: (1) category II approach lights; (2) standard runway markings; (3) category II runway lights.	CAT II			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
SPA.LVO.110	Suitable aerodrome : runway and runway environment - navigations facilities: For CAT III instrument approach operations, a PA runway category III should be used. The following visual aids should be available: (1) category III approach lights; (2) standard runway markings; (3) category III runway lights.	CAT III			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Suitable aerodrome : runway and runway environment - navigations facilities: For SA CAT I operations: (1) where an ILS or MLS or GLS is used, it should not be promulgated with any restrictions affecting its usability and should not be offset from the extended centre line; (2) where an ILS or GLS is used, it should be at least the minimum ILS or GLS classification stated in the AFM and meet any of the required minimum performance parameters stated in the AFM; (3) the glide path angle is 3.0o; a steeper glide path, not exceeding 3.5 o and not exceeding the limits stated in the AFM, can be approved provided that an equivalent level of safety is achieved; and (4) runway markings, category I approach lights as well as runway edge lights, runway threshold lights, and runway end lights should be available.	SA CAT I			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Suitable aerodrome : runway and runway environment - navigations facilities: For SA CAT II operations: (1) where an ILS or MLS or GLS is used, it should not be promulgated with any restrictions affecting its usability and should not be offset from the extended centre line; (2) where an ILS or GLS is used, the following applies: (i) if the AFM provides such data, the minimum ILS or GLS classification stated in the AFM; or (ii) when such data is not provided: (A) where an GLS is used, it should be certified to at least GAST-C and to the GBAS point D; (B) where an ILS is used, it should be certified to at least class II/D/2;	SA CAT II			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(3) the glide path angle is 3.0°; a steeper glide path, not exceeding 3.2°, can be approved provided that the operator demonstrates an equivalent level of safety; and (4) the following visual aids should be available: (i) standard runway markings, category I approach lights as well as runway edge lights, runway threshold lights and runway end lights; and (ii) for operations with an RVR of less than 400 m, centre line lights.					
SPA.LVO.110	<u>LVO data not available for an aerodrome:</u> When the operator wishing to use an aerodrome where its relevant data for the purpose of LVO is not provided or some data is not provided, the operator should develop procedures to collect or develop the necessary data. The procedure should be specific to the State of the aerodrome or the area of operation and should be approved by competent authority.	ALL			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Operational assessment						
	<u>Number of approaches and landings:</u> The process to determine the number of approaches and landings should be based on identified risks and agreed with the competent authority, and comprise the following steps: (1) Identify the risks related to the landing system (based on the AFM or additional data from the TC/STC holder) which may include limitations in the conditions during the operational assessment (e.g. to perform the assessment under a non-commercial flight). (2) Determine complexity of the runway based on: (i) a set of criteria based on the certification assumptions identified in the AFM or additional data from the TC/STC holder; (ii) availability and quality of runway data supporting the risk assessment; (iii) other known factors identified. (3) Scale the number of required approaches based on complexity.	CAT II, CAT III, SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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SPA.LVO.110	Operational assessment: When performing an operational assessment, the operator should verify each aircraft type and runway combination by successfully completing the determined number of approaches and landings according to the process in point (l) below and the conditions determined in **Table 15 of AMC1 SPA.LVO.110**.	CAT II, CAT III, SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Use of different variants of an aircraft type: If the operator has different variants of the same type of aircraft, utilising the same landing systems, the operator should show that the variants have satisfactory operational performance, but there is no need to conduct a full operational assessment for each variant/runway combination.	CAT II, CAT III, SA CAT I, SA CAT II, EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Use of manufacturers simulation/verification if FSTD: The operator may replace partially or completely the approaches and landings to a particular runway, if approved by the competent authority, with: (1) simulations made by the aircraft manufacturer or approved design organisations, if the terrain is properly modelled in the simulation; (2) a verification using an FSTD, if the FSTD is suitable for the operational assessment.	CAT II, CAT III, SA CAT I, SA CAT II, EFVS	- Check that the operator has assessed the suitability of the FSTD to be used (see GM9 SPA.LVO.110 for criteria to determine the suitability of an FSTD: • Aircraft systems, • Pre-threshold and runway terrain • Navigation facilities and associated instrument flight approach procedures • Runway environment characteristics and facilities)		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
Additional verification of the suitability of runways for EFVS operations						
SPA.LVO.110	The assessment of the suitability of the aerodrome should include whether the approach and runway lights installed (notably incandescent or LED lights) are adequate for the EFVS equipment used by the operator.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	Additionally, the operator should assess obstacles for the following operations: (1) NPA procedures; (2) APV;	EFVS			☐ N/A ☐ C ☐ NC	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
	(3) category I PA procedures on runways where an OFZ is not provided; and (4) approach procedures not designed in accordance with PANS-OPS or equivalent criteria. This assessment is conducted in order to determine whether: (1) obstacle protection can be ensured in the visual segment from DA/H to landing, without reliance on visual identification of obstacles or in the event of a balked landing; and (2) obstacle lights installed (notably incandescent or LED lights) are adequate for the EFVS equipment used by the operator.				☐ R ☐ N/R	
SPA.LVO.110	If the assessment determines that obstacle clearance cannot be ensured in the visual segment without reliance on visual identification of obstacles, the operator should not authorise EFVS operations to that runway or restrict the operation to the type and/or category of instrument approach operations where obstacle protection is ensured.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	If the assessment determines that obstacle protection is not assured in the event of a go-around initiated at any point prior to touchdown, the operator should not authorise the operation unless procedures to mitigate the risk of inadequate obstacle protection are developed and implemented.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	
SPA.LVO.110	If the AFM stipulates specific requirements for approach procedures, the operational assessment should include a determination of whether these requirements can be met.	EFVS			☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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Reference	Requirement	Applicability	Specific requirements/expectations	Eval. operator	Eval. CA	Description
Reporting events of LVO						
ORO.GEN.160	- A reportable event should include: (1) significant deviations from the flight path not caused by flight crew input; (2) misleading information without flight deck alerts; (3) loss of airborne navigation equipment functions necessary for the operation; (4) loss of functions or facilities at the aerodrome necessary for the operation, including aerodrome operating procedures, ATC operation, navigation facilities, visual aids and electrical power supply; (5) loss of other functions related to external infrastructure necessary for the operation; and (6) any other event causing the approach or landing to be abandoned if occurring repeatedly. - The reports should be submitted to the aerodrome involved when relevant and in addition to the recipients prescribed in ORO.GEN.160(b).	ALL	- Check that the reporting procedures for LVO include this list of events.		☐ N/A ☐ C ☐ NC ☐ R ☐ N/R	

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