European Union Aviation Safety Agency

SAFETY MATERIAL

RMT.0379

‘All weather operations.’

SPT.0101

‘Promote the new European provisions on AWO’

AWO IMPLEMENTATION MANUAL

V1.3

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

together 4safety

In collaboration with

AESA AGENCIA ESTATAL DE SEGURIDAD AÉREA

Contents

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 harmonizes closer 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 and the lowest RVR (175 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.

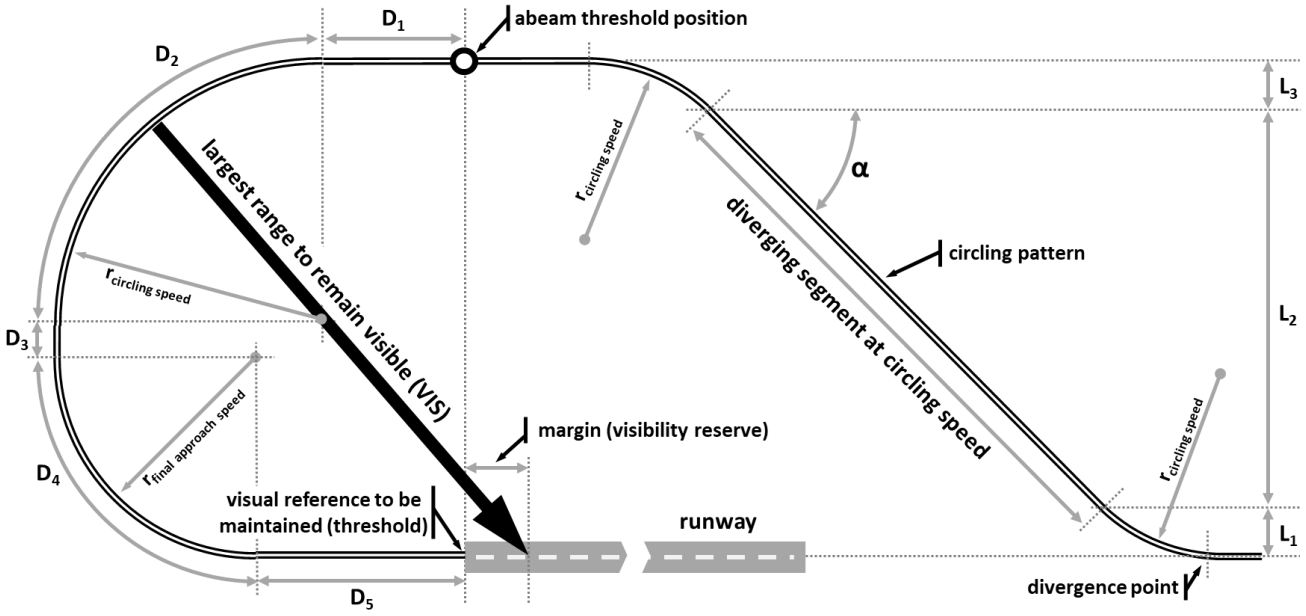
It may be noted that Doc 9635 Manual of All-Weather Operations (Fourth Edition, 2017) Chapter 6.4 paragraph 6.4.8 table 6-2 provides the same values as table 15 of AMC7 CAT.OP.MPA.110.

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 Amerca, 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

Temperature correction

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.

Note that 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 to 'not mandate' temperature correction is that safety assessments discussed during the rulemaking group RMT.0379 reveal that in CAT in Europe, the large majority of operations were performed under radar control, while in other aerospaces 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.

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.

The 1st Edition 2018 of the 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
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 50ft or greater, below 50ft 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 (50ft)' 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 (50ft)' 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.

[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

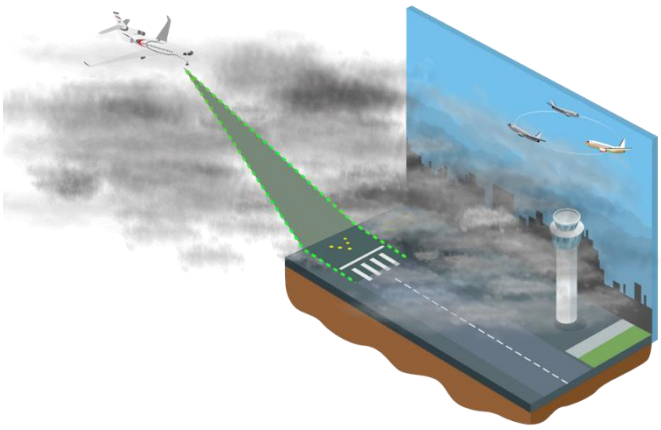
3.6.4 **EFVS**

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' 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.

[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 (…)

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) (…).

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

RVR/CMV (m) required without the use of EFVS	RVR/CMV (m) with the use of EFVS
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.

3.7 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.

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 **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

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 CATIII A 200 meters)

The ED Decision 2022/012/R has replaced the old CATIII A with an RVR 200 meters to a CATIII DH 50-99ft RVR 175 meters

Old

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

New

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 CATIII A to CATIII (editorial amendment). However, the operator maintained an RVR of 200 m.
3. The Operator notifies the authority about the replacement of CATIII A to CATIII (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 CATIII 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 CATIII 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 CATIII 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 CATII). 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 CATII from OTS CAT II

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

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 CATII can be credited to SA CATII 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 CATII 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 CATII 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 CATII.
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 CATIII 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: CATII, 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)

<table>
<tr><td colspan="5">OPERATIONS SPECIFICATIONS
(subject to the approved conditions in the operations manual)</td></tr>
<tr><td colspan="5">Issuing authority contact details
Telephone (1): _____; Fax: _____;
Email: _____</td></tr>
<tr><td>AOC (2):</td><td colspan="2">Operator name (3):</td><td>Date (4):</td><td>Signature:</td></tr>
<tr><td></td><td colspan="4">Dba trading name</td></tr>
<tr><td colspan="5">Operations specifications #:</td></tr>
<tr><td colspan="5">Aircraft model (5):
Registration marks (6):</td></tr>
<tr><td colspan="5">Types of operations: Commercial air transport</td></tr>
<tr><td>☐ Passengers</td><td colspan="2">☐ Cargo</td><td colspan="2">☐ Others (7): _____</td></tr>
<tr><td colspan="5">Area of operation (8):</td></tr>
<tr><td colspan="5">Special limitations (9):</td></tr>
<tr><td>Specific approvals:</td><td>Yes</td><td>No</td><td>Specification (10)</td><td>Remarks</td></tr>
<tr><td>Dangerous goods:</td><td>☐</td><td>☐</td><td></td><td></td></tr>
<tr><td>Low-visibility operations</td><td></td><td></td><td></td><td rowspan="3"></td></tr>
<tr><td>Take-off</td><td>☐</td><td>☐</td><td>RVR (11):.. m
e.g., RVR 125 m RVR 75 m (guided)</td></tr>
<tr><td>Approach and landing</td><td>☐</td><td>☐</td><td>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:</td></tr>
</table>

			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).

EASA Form 139 Issue 7

8 AWO IMPLEMENTATION OF AERODROMES

8.1 Implementation of Low Visibility Proc.(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.

9. **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.

9.2 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?**

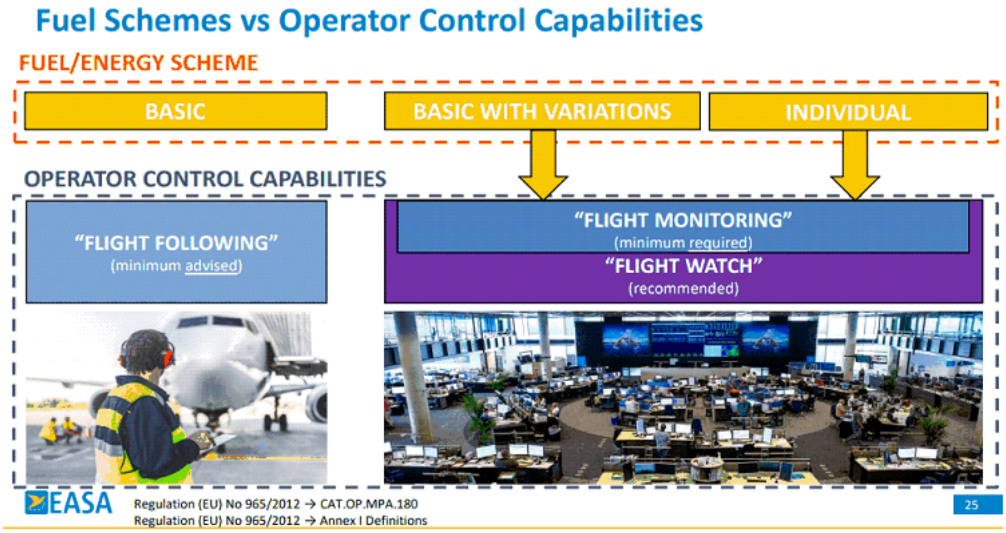
Yes, we can confirm that an operator will only have to apply the AMC relevant for the variations to the basic fuel scheme that it intends to use. This is explained in detail in GM1 CAT.OP.MPA.180.

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.