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Federal Office of Civil Aviation FOCA
Safety Division - Flight Operations

FOCA Certification Leaflet (CL)

Low Visibility Operations

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List of Abbreviations

The following abbreviations are within this Certification Leaflet:

Abbreviation	Definition
ACFT	Aircraft
AFM	Airplane Flight Manual
AOC	Air Operator Certificate
APV	Approach Procedure with Vertical Guidance
ATC	Air Traffic Control
AWO	All Weather Operation
CL	Certification Leaflet
CMV	Converted Meteorological Visibility
DH	Decision Height
EASA	European Aviation Safety Agency
EVS	Enhanced Vision System
FAA	Federal Aviation Administration
FCM	Flight Crew Member
FGS	Flight Guidance System
FOCA	Federal Office of Civil Aviation
G/A	Go Around
GND	Ground
GNSS	Global Navigation Satellite System
HUD	Head Up Display
HUDLS	Head Up Display Landing System…
ICAO	International Civil Aviation Organization
ID	Identification Number
ILS	Instrument Landing System
LIFUS	Line Flying under Supervision
LPC	Licence Proficiency Check
LTS CAT I	Lower than standard CAT I
LVO	Low Visibility Operations
LVP	Low Visibility Procedures
LVTO	Low Visibility Take-Off
MEL	Minimum Equipment List
MLS	Microwave Landing System
N/A	Not applicable
OEI	One Engine Inoperative
OPC	Operator Proficiency Check
OPS-SPECS	Operations Specifications
OTS CATII	Other than standard CAT II
PAR	Precision Approach Radar
RVR	Runway Visual Range
SOP	Standard Operating Procedures
STD	Synthetic Training Device
TRE	Type Rating Examiner
TRI	Type Rating Instructor
ZFTT	Zero Flight Time Training

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CL 0 Introduction

All Certification Leaflets (CL) are intended to assist the organisation/operator in the implementation of relevant matters into the activities and document system of the organisation/operator, as well as to ensure compliance with legal requirements. It is to be considered a tool for the organisation/operator in order to ease processes of obtaining required and defined acceptances, approvals and authorisations issued by the Federal Office of Civil Aviation (FOCA). Using the CL will facilitate establishing compliance with defined requirements and will lead through the respective certification or variation process. This is achieved by the presentation of key questions to be used by the organisation/operator to question completeness and compliance of the information contained in the respective document system by performing a self-assessment prior to submitting the documentation to FOCA.

It is important to understand that FOCA will use the identical CL when evaluating regulatory compliance to a specific requirement. The CL is also used as a checklist when performing the authorities' technical finding during the certification or variation process. The questions used by the organisation/operator during the self-assessment are identical to those used by the responsible inspector during the evaluation process.

0.1. Purpose of this CL

The purpose of this certification leaflet is to provide:

The following document serves the operator in case of application for the operations specification "Low Visibility Operations", and as well for the FOCA Flight Operations Inspector for the evaluation of the application. The document does cover only the flight operational aspects. Airworthiness aspects must be considered additionally.

In this CL the topic AWO is divided in a part "Low visibility Take-off" and "Low visibility Approach" since not all operators apply for both issues.

Since the use of Systems like EVS, HUD or HUDLS may allow operations with a lower visibility than normal and operations Lower than Standard CAT I or other than Standard CAT II require the approval from the NAA, this topics are also covered in this CL.

0.2. Scope

The presented guidance material covers all aspects of All Weather Operations requirements and shall assist the applicant to be compliant with these requirements.

0.3. Terms and Conditions

When used throughout the Certification Leaflet the following terms shall have the meaning as defined below:

Term	Meaning	Reference
shall, must, will	These terms express an obligation, a positive command.	EC English Style Guide: Ch. 7.19
may	This term expresses a positive permission.	EC English Style Guide: Ch. 7.21
shall not, will not	These terms express an obligation, a negative command.	EC English Style Guide: Ch. 7.20
may not, must not	These terms express a prohibition.	EC English Style Guide: Ch. 7.20
need not	This term expresses a negative permission.	EC English Style Guide: Ch. 7.22
should	This term expresses an obligation when an acceptable means of compliance should be applied.	EASA Acceptable Means of Compliance publications FOCA policies and requirements
could	This term expresses a possibility.	http://oxforddictionaries.com/definition/english/could
ideally	This term expresses a best possible means of compliance and/or best experienced industry practice.	FOCA recommendation

Note: To highlight an information or editorial note, a specific note box is used.

- The use of the male gender should be understood to include male and female persons.

0.4. List of References

This Certification Leaflet is based on:

Legal Reference	Issue	Subject
Basic Regulation (EC) No 216/2008	20.02.2008	Common rules in the field of civil aviation and establishing an European Aviation Safety Agency
Commission Regulation (EU) No 965/2012	05.10.2012	Technical requirements and administrative procedures related to air operations Annex I: DEF; Annex II: Part-ARO; Annex III: Part-ORO; Annex IV: Part-CAT; Annex V: Part-SPA
Commission Regulation (EU) No 1178/2011	03.11.2011	Technical requirements and administrative procedures related to civil aviation aircrew Annex I: Part-FCL; Annex II: Conversion of existing national licences and ratings; Annex III: Acceptance of Licences of third countries; Annex IV: Part-MED
Commission Regulation (EU) No 290/2012 (amending regulation 1178/2011)	30.03.2012	Technical requirements and administrative procedures related to civil aviation aircrew Annex V: Part-CC; Annex VI: Part-ARA; Annex VII: Part-ORA
Directive 2003/42/EC	13.06.2003	Occurrence reporting in civil aviation
Regulation (EU) No 996/2010	20.10.2010	Investigation and prevention of accidents and incidents in civil aviation
EASA CS AWO	-	AWO certification document
ICAO Doc 9365 AN/910	-	AWO Document (basic aeronautical requirements for CAT II and CAT III)
ICAO Annex 6	-	Operation of Aircraft
FAA AC 120-28D	-	Criteria for Approval of Category III

0.5. Organisation/Operator Responsibilities

Before submitting the application, it is essential for the operator to be familiar with the regulation and to submit the complete documentation in respect to the applicable regulation.

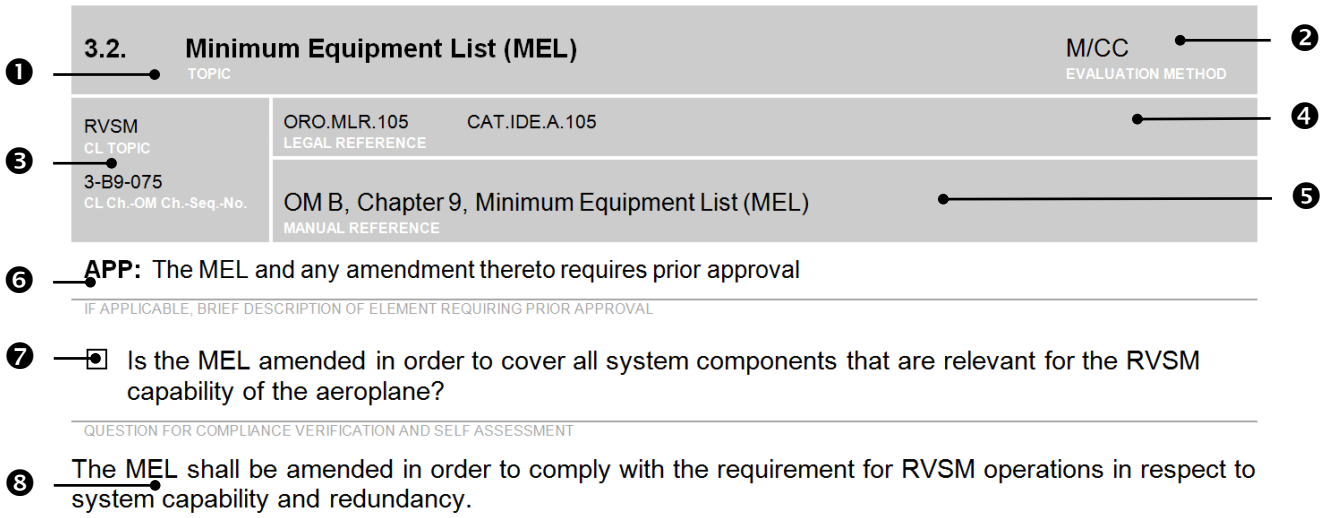
Since this CL shall give additional information to the applicable regulation, the sole rely upon this CL is not sufficient. The applicant must be familiar with and take the mentioned regulations into account.

0.6. Private operation of complex aeroplanes

This CL is also applicable for private operation with complex aeroplanes. If the private operator does not maintain an Operations Manual System, an equivalent and complete documentation covering all items of this CL must be established and sent to FOCA/SBOC for the All Weather Operation approval process.

0.7. Format of the CL

The CL consists of a standardised modular reference box system. The following presentation provides details of the defined format:



❶	Topic: subject description
❷	FOCA evaluation method
❸	FOCA / Topic Reference Number which may be used as identification in addition to interlink between this leaflet and the Document Evaluation Report (Finding Report). The Number consists of a combination of: - a subject code related to the specific topic/ theme; and - sequence number in the respective chapter of the CL. The above example 3-B9-075 indicates: RVSM = CL regarding RVSM Specific Approval, 3 = CL section; B9 = OM chapter under evaluation (here OM-B, Chapter 9.), followed by 075 = sequence number.
❹	Associated legal reference and/ or reference to other relevant publications including information on formal Acceptance (ACC) or Approval (APP) where applicable.
❺	Reference to the Part(s), Chapter(s) and/or Subchapters of the organisation's document systems or manual system as required by the applicable Part.
❻	If the legal provision requires a formal approval, a short description of the content of this approval is provided.
❼	Questions for self-assessment and compliance verification.
❽	Provides instructions, provisions, regulatory requirements, guidelines, acceptable means of compliance and examples of current best practice.

CL 1 Low Visibility General

1.1. Low Visibility Operations Concept

The objective of Lower than Standard CAT I, other than Standard CAT II, CAT II and CAT III operations is to provide a level of safety when landing in low visibility conditions, equivalent to that of 'normal' operating conditions. Lower than Standard CAT I, other than Standard CAT II, Category II / Category III constitutes the main part of All Weather Operations (AWO), which also consists of take-off and taxiing in low visibility conditions.

Although ICAO, the FAA and Air Operations regulations are slightly different, all refer to the same concepts for CAT II and CAT III operations.

The main difference between Lower than Standard CAT I, other than Standard CAT II, CAT II and CAT III operations is that Lower than Standard CAT I, other than Standard CAT II and Category II provides sufficient visual reference to permit a manual landing at DH, whereas Category III does not provide sufficient visual references and requires an automatic landing system.

Approval for Low visibility operations is dependent on four elements in order to maintain the required level of safety:

- the aeroplane
- the aerodrome
- the flight crew
- the operator

All of these elements must comply with the regulations established by the operator's responsible authority.

Or in other words and as an example for an actual CAT III approach and landing: an aircraft type must be approved for CAT III operations with an automatic landing system, which provides automatic control of the aircraft during approach and landing, the airfield must be approved for CAT III operations (with low visibility procedures in force), the operator must be in the possession of CAT III approval and the crew must be appropriately trained and current in CAT III operations.

1.2. Definitions

1.2.1 Low Visibility Procedures (LVP)

Procedures applied at an aerodrome for the purpose of ensuring safe operations during Lower than Standard Category I, Other than Standard Category II, Category II and III approaches and low visibility take-offs.

1.2.1.1 Low Visibility Take-Off (LVTO)

A Take-Off where the Runway Visual Range (RVR) is less than 400m.

1.2.1.2 Low Visibility Approach Types

	ICAO	**EASA**	FAA
Cat II	A category II approach is a precision instrument approach and landing with decision height lower than 200ft (60m) but not less than 100ft (30m), and a runway visual range not less than 1200ft (350m).	A category II approach is a precision instrument approach and landing with decision height lower than 200ft (60m) but not lower than 100ft (30m), and a runway visual range not less than 1000ft (300m).	A category II approach is a precision instrument approach and landing with decision height lower than 200ft (60m) but not lower than 100ft (30m), and a runway visual range less than 2400ft (800m) but not less than 1200ft (350m).
Cat III A	A category III A approach is a precision instrument approach and landing with no decision height or a decision height lower than 100ft (30m) and a runway visual range not less than 700ft (200m).	A category III A approach is a precision instrument approach and landing with a decision height lower than 100ft (30m) and a runway visual range not less than 700ft (200m).	A category III A approach is a precision instrument approach and landing with no decision height or a decision height lower than 100ft (30m) and a runway visual range not less than 700ft (200m).
Cat III B	A category III B approach is a precision approach and landing with no decision height or a decision height lower than 50ft (15m) and a runway visual range less than 700ft (200m), but not less than 150ft (50m).	A category III B approach is a precision approach and landing with no decision height or a decision height lower than 50ft (15m) and a runway visual range less than 700ft (200m), but not less than 250ft (75m).	A category III B approach is a precision approach and landing with no decision height or a decision height lower than 50ft (15m) and a runway visual range less than 700ft (200m), but not less than 150ft (50m).
Cat III C	A category III C approach is a precision approach and landing with no decision height and no runway visual range limitation.	CAT III C operations are not currently authorized and the EASA does not mention this sub-category.	A category III C approach is a precision approach and landing with no decision height and no runway visual range limitation.

		ICAO	**EASA**	FAA
CAT II	DH	100ft ≤ DH < 200ft	100ft ≤ DH < 200ft	100ft ≤ DH < 200ft
	RVR	350m ≤ RVR 1200ft ≤ RVR	300m ≤ RVR 1000ft ≤ RVR	350m ≤ RVR < 800m 1200ft ≤ RVR < 2400ft
CAT III A	DH	No DH or DH < 100ft (1)	DH < 100ft (1)	No DH or DH < 100ft (1)
	RVR	200m ≤ RVR 700ft ≤ RVR	200m ≤ RVR 700ft ≤ RVR	200m ≤ RVR 700ft ≤ RVR
CAT III B	DH	No DH or DH < 50ft	No DH or DH < 50ft	No DH or DH < 50ft
	RVR	50m ≤ RVR < 200m 150ft ≤ RVR < 700ft	75m ≤ RVR < 200m 250ft ≤ RVR < 700ft	50m ≤ RVR < 200m 150ft ≤ RVR < 700ft
CAT III C	DH	No DH	N/A	No DH
	RVR	No RVR Limitation	N/A	No RVR Limitation

(1) DH ≥ 50ft if fail passive

	EASA		
Lower than Standard CAT I	A lower than standard category I approach is a precision instrument approach and landing with decision height lower than 250ft (75m) but not lower than 200ft (60m), and a runway visual range not less than 400m (1400ft). (requires auto land (CAT IIIa Certification), or HUDLS and CS-AWO certification to CAT II minimum)	DH	200ft ≤ DH < 250ft
		RVR	400m ≤ RVR 1400ft ≤ RVR
Other than Standard CAT II	An other than standard category II approach is a precision instrument approach and landing with decision height lower than 200ft (60m) but not lower than 100ft (30m), and a runway visual range not less than 350m (1200ft),if some or all of the elements of the ICAO Annex 14 Precision Approach Category II lighting system are not available. (requires auto land or HUDLS)	DH	100ft ≤ DH < 200ft
		RVR	350m ≤ RVR 1200ft ≤ RVR

1.2.1.2.1. Acceptable operational correspondence meter/feet (according ICAO)

15m = 50ft	30m = 100ft	50m = 150ft	75m = 250ft
100m = 300ft	150m = 500ft	175m = 600ft	200m = 700ft
300m = 1000ft	350m = 1200ft	500m = 1600ft	550m = 1800ft
600m = 2000ft	800m = 2400ft	1000m = 3000ft	1200m = 4000ft
1600m = 5000ft			

1.2.1.2.2. Low Visibility Operation

Low visibility operations include:

- manual take-off (with or without electronic guidance systems or HUDLS/- Hybrid HUD/HUDLS);
- auto-coupled approach to below DH, with manual flare, landing and rollout;
- approach flown with the use of a HUDLS/Hybrid HUD/HUDLS and/or EVS);
- auto-coupled approach followed by auto-flare, auto landing and manual roll-out; and
- auto-coupled approach followed by auto-flare, auto landing and auto-rollout, when the applicable RVR is less than 400 m.

1.2.1.3 Flight control system

A system which includes an automatic landing system and/or a hybrid landing system.

1.2.1.4 Fail-Operational flight control system

A flight control system is fail-operational if, in the event of a failure below alert height, the approach, flare and landing, can be completed automatically. In the event of a failure, the automatic landing system will operate as a fail-passive system.

1.2.1.5 Fail-Passive flight control system

A flight control system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition or deviation of flight path or attitude but the landing is not completed automatically. For a fail-passive automatic flight control system the pilot assumes control of the aeroplane after a failure.

1.2.1.6 Runway Visual Range (RVR)

Runway Visual Range (RVR) is the range over which a pilot of an aeroplane of the centre line of the runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

1.2.1.7 Converted Meteorological Visibility (CMV)

A value (equivalent to an RVR) which is derived from the reported meteorological visibility, as converted in accordance with the requirements in the AWO subpart.

The CMV shall not be used for:

- take-off;
- for calculating any other required RVR minimum less than 800m (e.g. for Approach);
- when reported RVR is available.

1.2.1.8 Head Up Display (HUD)

A display system which presents flight information into the pilot's forward external field of view and which does not significantly restrict the external view.

1.2.1.9 Head Up Display Landing System (HUDLS)

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

1.2.1.10 Hybrid Head Up Display Landing System (hybrid HUDLS)

A system which consists of a primary fail-passive automatic landing system and a secondary independent HUD/HUDLS enabling the pilot to complete a landing manually after failure of the primary system.

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

1.2.1.11 Enhanced Vision System (EVS)

An electronic means of displaying a real-time image of the external scene through the use of imaging sensors.

1.2.1.12 Lower Than Standard Category I Operation (LTS)

A Category I Instrument Approach and Landing Operation using Category I DH, with an RVR lower than it would normally be associated with the applicable DH.

Note: An operator must be approved by the authority for this operation.

1.2.1.13 Other Than Standard Category II Operation (OTS)

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

Note: An operator must be approved by the authority for this operation.

1.2.1.14 GNSS Landing System (GLS)

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

CL 2 Low Visibility Take-Off

The permission to conduct Low Visibility Take-off is an Operations Specification. To get the permission to perform Low Visibility Take-off, an approval by FOCA is required.

The lower the requested minimum RVR is, the more complex it is to get the approval.

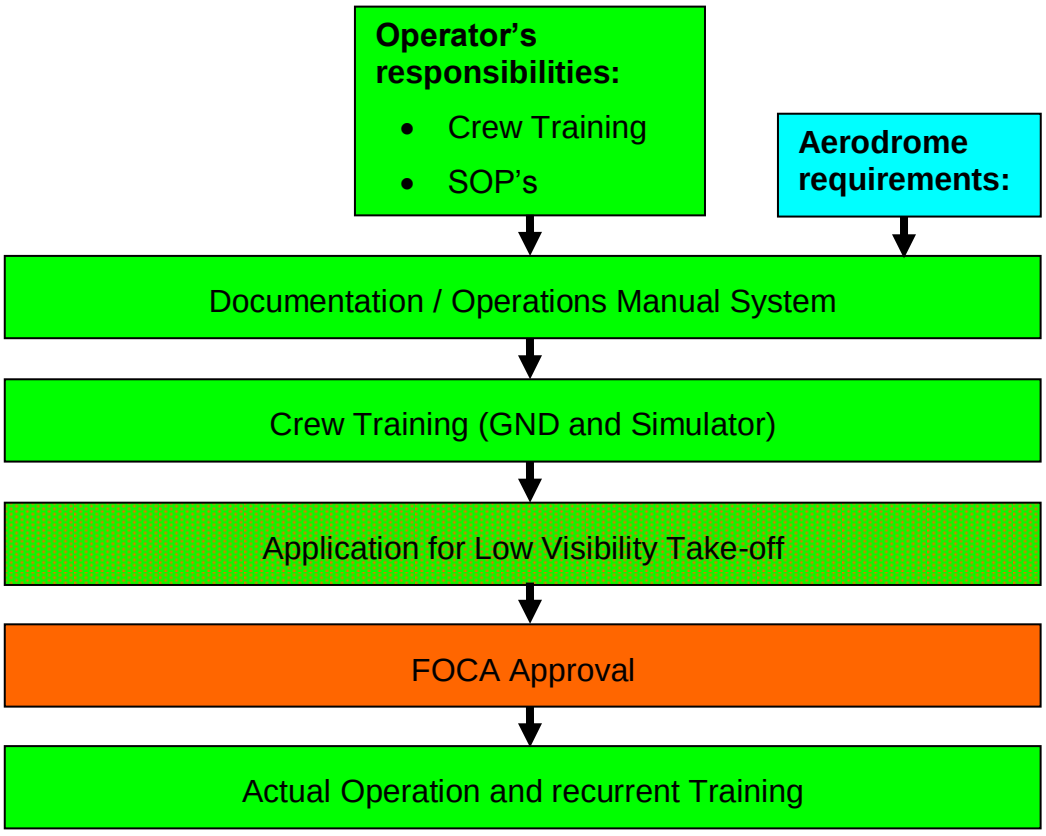
The requirements differentiate between:

LVTO with RVR between 400m and 150m

LVTO with RVR between 150m and 125m

LVTO with RVR between 125m and 75m

2.1. LVTO Approval Process



2.2. Documentation

2.2.1 LVTO Operations Specifications (TOPIC)	M / CC (EVALUATION METHOD)
LVO (CL TOPIC)	ORO.MLR.100 ORO.MLR.101 SPA.LVO.100 (LEGAL REFERENCE)
2-A0.1-005 (CL Ch.-OM Ch.-Seq.-No.)	OM – A Chapter 0.1 “Introduction” (MANUAL REFERENCE)

APP: All elements of low visibility operations are considered as operations specifications and require the approval of the authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is the possibility for LVTO and the limiting RVR for LVTO mentioned?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The description in the Chapter “Introduction” must contain the information/value concerning Low Visibility Take-off in the list of the operations specifications:

- Take-off minima established by the operator must be expressed as RVR/visibility limits.

2.2.2 Operational Control and Supervision (TOPIC)	M / CC (EVALUATION METHOD)
LVO (CL TOPIC)	ORO.MLR.100 ORO.MLR.101 SPA.LVO.100 (LEGAL REFERENCE)
2-A2.1-010 (CL Ch.-OM Ch.-Seq.-No.)	OM – A Chapter 2.1 “Operational Control and Supervision” (MANUAL REFERENCE)

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are the possibility and relevant RVR limitation in the operational control and supervision considered?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

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

These values must be evaluated and considered in the early planning phase, when an operator considers to operate from an aerodrome, also in the planning phase before the intended flight and during the actual flight operation.

2.2.3 Crew Qualification for LVTO TOPIC	M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 ORO.MLR.101 SPA.LVO.100 LEGAL REFERENCE
2-A5.1-015 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 5.1 “Qualification Requirements” MANUAL REFERENCE

APP: All elements of low visibility operations are considered as operations specifications and require an approval of the authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is there a statement concerning the LVTO qualification for all Flight Crew members?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The description in the Chapter 5.1 shall consider the LVTO qualification for all FCM, on the aeroplane/fleet concerned.
- This description shall include/refer to the (OM-D) key courses “conversion”, “nomination as Commander” and “recurrent”.

A reference to the OPS SPECS shall be available in order to be able to determine the applicable LVTO minima.

2.2.4 Flight Preparation Instructions TOPIC	M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 ORO.MLR.101 CAT.OP.MPA.110 SPA.LVO.100 LEGAL REFERENCE
2-A8.1-020 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 8.1.2 “Criteria for the use of aerodromes” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are Criteria and responsibilities for the authorisation of the use of aerodromes established?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

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

2.2.5 **Take-off Minima** TOPIC				M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100
2-A8.1-025 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 8.1.3 “Methods of determination of aerodrome operating minima” MANUAL REFERENCE			

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is there a list determining the required RVR for available facilities?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Information, preferable in tabulated form, shall be available to present the required minimum RVR for the available facility.

Facilities	**RVR / visibility (see note 3)**
NIL (day only)	500m
Runway edge lighting and/or centre line marking	250/ 300m (see Notes 1 and 2)
Runway edge and centre line lighting	200/ 250m (see Note 1)
Runway edge and centre line lighting and multiple RVR information	150/ 200m (see Notes 1 and 4)
Note 1: The higher values apply to Category D aeroplanes. *Note 2:* For night operations at least runway edge and runway end lights are required. *Note 3:* The reported RVR/Visibility value representative of the initial part of the take-off run can be replaced by pilot assessment. *Note 4:* The required RVR value must be achieved for all of the relevant RVR reporting points with the exception given in Note 3 above.	

2.2.6 Low Visibility Operations TOPIC				M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100
2-A8.4-030 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 8.4. “Low Visibility Operations” MANUAL REFERENCE			

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is the Low Visibility Take-Off procedure described in detail?

☐ Are the special items/considerations mentioned?

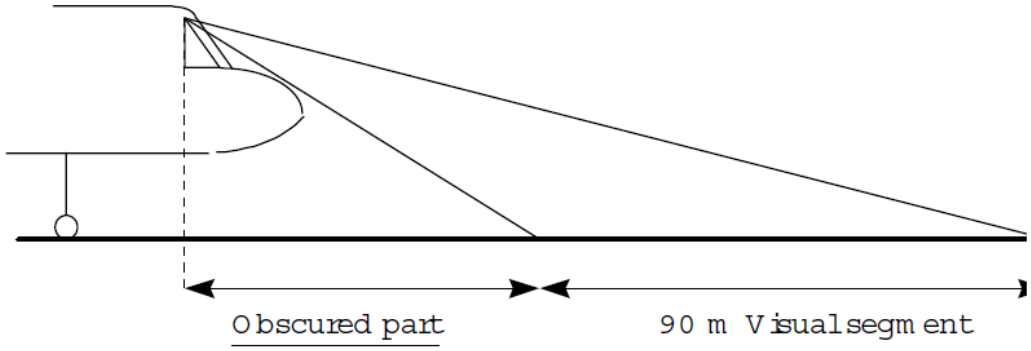
☐ Are meteo/runway status limitations concerning LVTO mentioned?

☐ Is there a general description of the “obscured part/visual segment”?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Following issues shall be described in the appropriate Chapter:

- When the reported meteorological visibility is below that required for take-off and RVR is not reported, a take-off may only be commenced if the commander can determine that the RVR/visibility along the take-off runway is equal to or better than the required minimum (determination of visual segment).
- When no reported meteorological visibility or RVR is available, a take-off may only be commenced if the commander can determine that the RVR/visibility along the take-off runway is equal to or better than the required minimum.
- Visual reference. The take-off minima must be selected to ensure sufficient guidance to control the aeroplane in the event of both a discontinued take-off in adverse circumstances and a continued take-off after failure of the critical power unit.
- If the operator has specific policies concerning LVTO (e.g. in case of contaminated runway, no Copilot Take-off etc.), they shall be described.
- A general description and graphical illustration of the obscured part/ visual segment shall be included in the Chapter.



2.2.7 LVTO Information TOPIC				M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100
2-B0-035 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 0 “General” MANUAL REFERENCE			

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are the aeroplane specific LVTO values correct and consistent listed in the Chapter 0?

☐ Are the requested/ listed LVTO minima according the aeroplane and HUD/HUDLS certification?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The requested/certified LVTO values must be listed in the general part, where all the operations specifications are listed (e.g. LVTO RVR 125m).

If the Operator requests a LVTO minimum of lower than 125m (for Category A, B or C aeroplanes) or 150m (for a Category D aeroplane) but in no case lower than 75m, the HUD/HUDLS must be certified for the T/O and the requested LVTO minima.

2.2.8 LVTO Limitations TOPIC				M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100
2-B1-040 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 1 “Limitations” MANUAL REFERENCE			

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are the certified operational limitations of the aeroplane described?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The description in the Chapter “Limitations” must contain the following topics concerning Low Visibility Take-off:

- certification status
- types of operation that are approved
- wind limits
- limitations on wet or contaminated runway
- performance limitations for applicable configuration
- system limitations (e.g. HUDLS operative).

2.2.9 LVTO Procedures TOPIC				M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100
2-B2-045 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 1 “Limitations” MANUAL REFERENCE			

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

- ☐ If applicable: is there a separate T/O profile described for LVTO?
- ☐ If applicable: is there a separate T/O method described for LVTO?
- ☐ Is there a restriction who is entitled to perform the LVTO (e.g. CMD only)?
- ☐ Is there a description/ graphical illustration of the obscured part/ visual segment (or an appropriate reference to OM A 8.4)?
- ☐ Is the obscured part defined (value)?
- ☐ Is the use of HUD/HUDLS described?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- If the LVTO is different to the normal T/O, a separate description of the T/O method and T/O profile is required (e.g. standing T/O, special configuration etc).
- Appointed crew station duty assignments must be stated or referred to the OM A 8.3.
- The obscured segment must be defined with a value depending on A/C dimensions (e.g. for Falcon 7X: 8.8m). See also 2.2.6 above.
- If a HUD/HUDLS is used for LVTO, its use must be described.
- If the use of HUD/HUDLS is optional for LVTO, both methods (or at least the differences) must be described.

2.2.10 LVTO Performance TOPIC				M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100
2-B4-050 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 4 “Performance” MANUAL REFERENCE			

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

- ☐ Are performance considerations for LVTO described?
- ☐ Is there a specific configuration to be used for LVTO and is this configuration considered in the T/O calculation?
- ☐ How is the Accelerated Stop Distance calculated?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The configuration used for LVTO must be considered within the performance calculation method
- In case of reduced RWY availability (e.g. last segment RVR below minimum), the accelerated stop distance must be calculated and compared with the runway available, in order to be able to conduct the T/O.

2.2.11 Minimum Equipment List (MEL) (TOPIC)				M / CC (EVALUATION METHOD)
LVO (CL TOPIC)	ORO.MLR.100 (LEGAL REFERENCE)	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100
2-B8-055 (CL Ch.-OM Ch.-Seq.-No.)	OM – B Chapter 8 “Minimum Equipment List” (MANUAL REFERENCE)			

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are MEL items listed that are affecting LVTO?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The MEL shall contain all items affecting a Low Visibility Take-Off capability.
- Operational- and/or Maintenance Procedures required for LVTO dispatch under MEL shall be listed.

2.2.12 Aerodrome Data (TOPIC)				M / CC (EVALUATION METHOD)
LVO (CL TOPIC)	ORO.MLR.100 (LEGAL REFERENCE)	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100
2-C1-060 (CL Ch.-OM Ch.-Seq.-No.)	OM – C Chapter 1 “Operating Minima” (MANUAL REFERENCE)			

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are Operating Minima for departure Aerodromes available?

☐ Are Runway data and aerodrome facilities described?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The Route and Aerodrome instruction and information must contain operating minima for the departure aerodrome and operating minima for take-off alternate.
- Information about aerodrome facilities and runway data must be available and explained in the OM-C or parts thereof (e.g. Jeppesen etc).

2.3. Flight Crew Training

2.3.1 LVTO Conversion Course (TOPIC)					M / CC (EVALUATION METHOD)
LVO (CL TOPIC)	ORO.MLR.100 (LEGAL REFERENCE)	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
2-D2.1-065 (CL Ch.-OM Ch.-Seq.-No.)	OM – D Chapter 2.1.X "Conversion Training (MANUAL REFERENCE)				

APP: The Training Programme shall be approved by the competent authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ If LVTO RVR <400m but ≥ 150m: Is there a specific conversion training module for LVTO available?

☐ If LVTO RVR< 150m but ≥ 75m: Is there a specific conversion training and checking module for LVTO available?

☐ If LVTO RVR< 150m but ≥ 75m: Is the LVTO at the lowest applicable minima mentioned in the OPC programme?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The LVTO training in the conversion course must contain at least:

- If LVTO RVR <400m but ≥ 150m:

- Ground Training according AMC1 SPA.LVO.120(b), specifically:
  - Characteristics and limitations of the ILS/or MLS
  - The characteristics of the visual aids
  - The characteristics of fog
  - The operational capabilities and limitations of the particular airborne system to include HUD symbology and EVS characteristics if appropriate.
  - The effects of precipitation, ice accretion, low level wind shear and turbulence
  - The effect of specific aeroplane malfunctions
  - The use and limitations of RVR assessment systems
  - The principles of obstacle clearance requirements
  - Recognition of and action to be taken in the event of failure of ground equipment
  - The procedures and precautions to be followed with regard to surface movement during operations when the RVR is 400 m or less and any additional procedures required for take-off in conditions below 150m (200m for category D aeroplanes).
  - The qualification requirements for pilots to obtain and retain approval to conduct Low Visibility Take-offs.
  - The importance of correct seating and eye position.

- Simulator Training according AMC1 SPA.LVO.120 (c), specifically:
  - An operator must ensure that each flight crew member is trained to carry out his/her duties and instructed on the coordination required with other crew members.
  - Training must be divided into phases covering normal operation with no aeroplane or equipment failures but including all weather conditions which may be encountered and detailed scenarios of aeroplane and equipment failure which could affect AWO operations. If the aeroplane system involves the use of hybrid or other special systems (such as HUD/HUDLS or EVS) then flight crew members must practice the use of these systems in normal and abnormal modes during the Flight Simulator phase of training.

- Checks of satisfactory functioning of equipment, both on the ground and in flight.
- Effect on minima caused by changes in the status of ground installations
- Actions to be taken in the event of systems failures and engine failure resulting in continued as well as rejected take-offs.
- The effect of known unserviceabilities and use of minimum equipment lists
- Operating limitations resulting from airworthiness certification
- Incapacitation procedures appropriate to Low Visibility Take-offs shall be practiced

Note: Previous experience of a flight crew member can be considered for the training.

- Additionally, if LVTO RVR< 150m but ≥ 75m
  - normal Take-off in minimum RVR conditions
  - Take-off in minimum authorized RVR conditions with an engine failure between V1 and V2, or as soon as safety considerations permit.
  - Take-off in minimum authorized RVR conditions with an engine failure before V1 resulting in a rejected Take-off.

Note: Such Training shall be carried out in a Flight Simulator (FSTD).

- The operator must ensure that a flight crew member has completed a check before conducting low visibility Take-offs in RVR of less than 150 m (less than 200 m for Category D aeroplanes) if applicable. The check may only be replaced by successful completion of the simulator training prescribed above.

The OM D shall provide a logical structure of the different training phases and shall consist of:

- Ground Training
- Simulator Training (terminated by a Proficiency Check to include LVTO procedures).

Example of Standard of Performance:

- The flight crew member shall demonstrate his ability to perform Low Visibility Take-off satisfactorily, according to the procedures defined in the Operations Manual.
- The crewmember shall be enabled to evaluate Meteorological Conditions and available aircraft and ground equipment and to take appropriate decisions regarding LVTO.

Instructor Requirements:

- Ground Training: suitably qualified GI
- Simulator Training: TRI (qualified on type and for AWO operations).

Proficiency Check:

If the operator is authorized to conduct takeoff with RVR less than 150m (200 m Cat D) at least one LVTO to the lowest applicable minima shall be performed during the conduct of the operator's proficiency check.

2.3.2 LVTO Recurrent Training and Checking TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
2-D2.1-070 CL Ch.-OM Ch.-Seq.-No.	OM – D Chapter 2.1.X “Recurrent Training” MANUAL REFERENCE				

APP: The Training Programme shall be approved by the competent authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is the LVTO Training described in the OM D, Key course “recurrent training”

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

An operator must ensure that, in conjunction with the normal recurrent training and operator proficiency checks, a pilot’s knowledge and ability to perform the tasks associated with the particular category of operation, for which he/she is authorised, is checked.

- If the operator is authorised to conduct take-off with RVR less than 150m (200 m Cat D),at least one LVTO to the lowest applicable minima shall be performed during the conduct of the operators proficiency check.

Instructor Requirements:

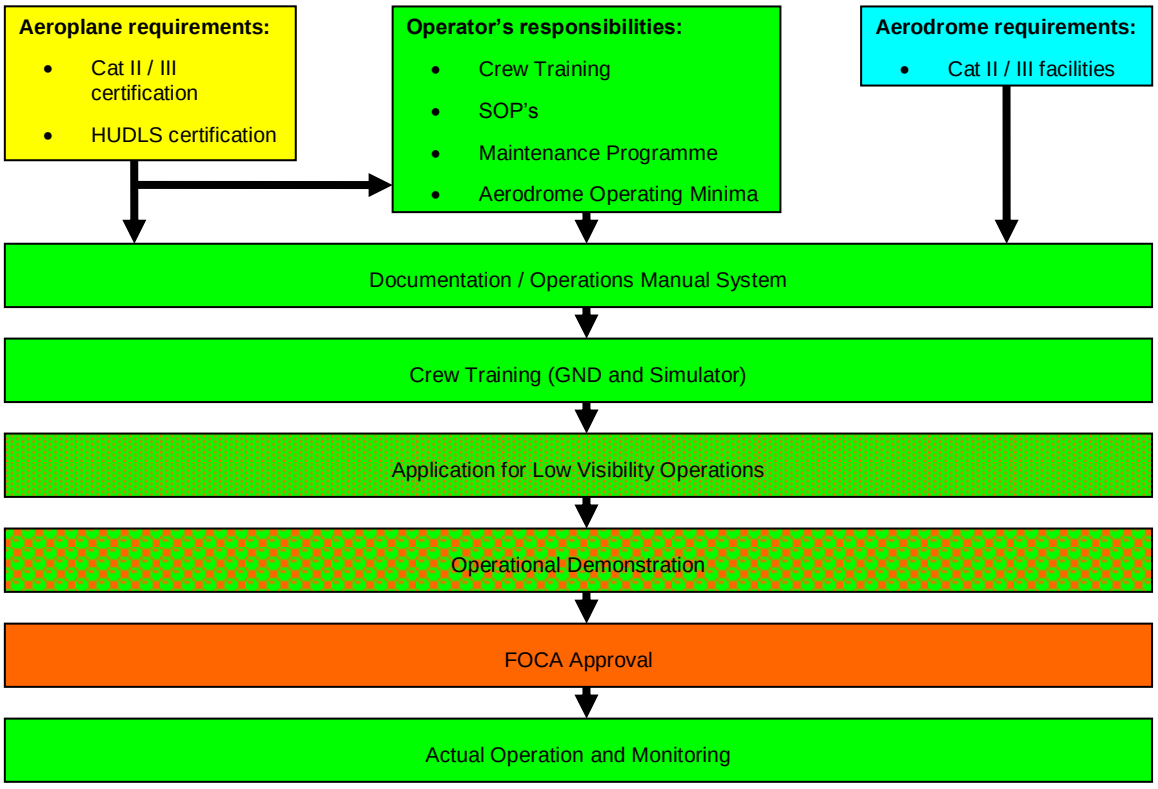
- Ground Training (if applicable): suitably qualified GI
- Simulator Training: TRI (qualified on type and for AWO operations)

Proficiency Check:

If the operator is authorised to conduct take-off with RVR less than 150m (200 m Cat D) at least one LVTO to the lowest applicable minima shall be performed during the conduct of the operators proficiency check.

CL 3 Low Visibility Approach

3.1. Certification Process



3.2. Documentation/ Operations Manual System

3.2.1 Operations Specifications (TOPIC)					M / CC (EVALUATION METHOD)
LVO (CL TOPIC)	ORO.MLR.100 (LEGAL REFERENCE)	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-A0.1-005 (CL Ch.-OM Ch.-Seq.-No.)	OM – A Chapter 0.1 “Introduction” (MANUAL REFERENCE)				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is the approved LVO minima listed in the Operations Specifications?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The description in the Chapter “Introduction” must contain the information/value concerning Low Visibility Operation:

- Approved approach minima and the relevant RVR limits must be listed (e.g. CAT II DH100ft/RVR300m).
- Additional approvals like Lower than Standard CAT I and Other than Standard CAT II must be listed.

3.2.2 Operational Control and Supervision (TOPIC)					M / CC (EVALUATION METHOD)
LVO (CL TOPIC)	ORO.MLR.100 (LEGAL REFERENCE)	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-A2.1-010 (CL Ch.-OM Ch.-Seq.-No.)	OM – A Chapter 2.1 “Operational Control and Supervision” (MANUAL REFERENCE)				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ How is the eligibility of aerodromes and runways considered in the operational control and supervision?

☐ How is the type and command experience considered in the operational control and supervision?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

A responsible person must be designated to supervise the eligibility of aerodromes and runways. The method, frequency and tool for this supervision must be defined.

- Each aeroplane type/on-board equipment/runway combination must be verified by the successful completion of at least one approach and landing in Category II or better conditions, prior to commencing Category III operations.
- For runways with irregular pre-threshold terrain or other foreseeable or known deficiencies, each aeroplane type/on-board equipment/runway combination must be verified by operations in standard Category I or better conditions, prior to commencing Lower than Standard CAT I, Category II, Lower than Standard CAT II or Category III operations.
- If an operator has different variants of the same type of aeroplane in accordance with next paragraph below, utilising the same basic flight control and display systems, or different basic flight control and display systems on the same type of aeroplane in accordance with paragraph below, the operator must show that the variants have satisfactory operational performance, but

the operator need not conduct a full operational demonstration for each variant/runway combination

- For the purpose of paragraph above, an aeroplane type or variant of an aeroplane type is deemed to be the same type/variant of aeroplane if that type/variant has the same or similar:
  - level of technology including the:
  - FGS and associated displays and controls;
  - the FMS and level of integration with the FGS;
  - use of HUDLS.
  - Operational procedures including:
  - alert height;
  - manual landing/automatic landing;
  - no decision height operations;
  - use of HUD/HUDLS in hybrid operations.
  - Handling characteristics including:
  - manual landing from automatic or HUDLS guided approach;
  - manual go-around from automatic approach;
  - automatic/manual roll out.

- Operators using the same aeroplane type/variant and on-board equipment combination and procedures may take credit from each others experience and records in complying with this paragraph.
- A responsible person must be designated to supervise type and command experience. The method, frequency and tool for this supervision must be defined.

Before commencing Category II operations, the following additional requirements are applicable to commanders, or pilots to whom conduct of the flight has been delegated, who are new to the aeroplane type:

- 50 hours or 20 sectors on the type, including line flying under supervision and
- 100 m must be added to the applicable Category II RVR minima when the operation requires a Category II manual landing or use of HUDLS for touchdown until:
- a total of 100 hours or 40 sectors, including LIFUS has been achieved on the type; or
- a total of 50 hours or 20 sectors, including LIFUS has been achieved on the type where the flight crew member has been previously qualified for Category II manual landing operations with a Community operator;

Note: for HUDLS operations, the sector requirements in paragraphs above shall always be applicable, the hours on type/class does not fulfil the requirement.

Before commencing Category III operations, the following additional requirements are applicable to commanders, or pilots to whom conduct of the flight may be delegated, who are new to the aeroplane type:

- 50 hours or 20 sectors on the type, including line flying under supervision; and
- 100 m must be added to the applicable Category II or Category III RVR minima unless he has previously qualified for Category II or III operations with a Community operator, until a total of 100 hours or 40 sectors, including line flying under supervision, has been achieved on the type.

3.2.3 LVO Crew Qualification TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
2-A5.1-015 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 5.1 “Qualification Requirements” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is there a statement concerning the LVO qualification for all Flight Crew members?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The description in the Chapter 5.1 shall consider the LVO qualification for all FCM, on the aeroplane/ fleet concerned.
- It shall be stated, that flight crew members are properly qualified prior to commencing an approach utilizing EVS, a Lower than Standard Category I, an Other than Standard Category II or a Category II or III approach.
- This description shall include/refer to the (OM D) key courses “conversion”, “nomination as Commander” and “recurrent”.
- A reference to the OPS SPECS shall be available in order to be able to determine the applicable LVTO minima.

3.2.4 LVO Approach Minima TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-A8.1-020 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 8.1.3 “Methods of determination of aerodrome operating minima” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ How is the required RVR (depending on the DH) for a Lower than Standard CAT I Approach apparent?

☐ How is the required RVR (depending on the DH) for a CAT II Approach apparent?

☐ How is the required RVR (depending on the DH) for an Other than Standard CAT II Approach apparent?

☐ Are the approach light systems (abbreviations) described?

☐ Is there a table to determine the effect on landing minima in case of failed or downgraded equipment?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

If the minima are not tailored to the aeroplane/equipment (e.g. in OM C), the following tables must be available.

Following Example for Lower than Standard CAT I:

Lower than Standard Category I minima						
DH(ft)			Class of lighting facility			
			FALS	IALS	BALS	NALS
			RVR/CMV (metres)			
200	—	210	400	500	600	750
211	—	220	450	550	650	800
221	—	230	500	600	700	900
231	—	240	500	650	750	1 000
241	—	249	550	700	800	1 100

Note 1: The visual aids comprise standard runway day markings, approach lighting, runway edge lights, threshold lights, runway end lights and, for operations below 450m, shall include touch-down zone and/or runway centre line lights.

Following Example for CAT II

Category II minima		
DH(ft)	Auto-coupled/Approved HUDLS to below DH *(Note 1a)*	
	RVR Aeroplane Category A, B and C	RVR Aeroplane Category D
100-120	300 m	300/350m *(Note 2a)*
121-140	400 m	400 m
141 and above	450 m	450m

Note 1a: The reference to 'auto-coupled to below DH/Approved HUDLS' in this table means continued use of the automatic flight control system or the HUDLS down to a height of 80 % of the DH. Thus airworthiness requirements may, through minimum engagement height for the automatic flight control system, affect the DH to be applied.

Note 2a: 300 m may be used for a Category D aeroplane conducting an auto-land.

Following Example for Other than Standard CAT II

Other than Standard Category II minima					
	Auto-land or approved HUDLS utilised to touchdown				
	Class of lighting facility				
	FALS		IALS	BALS	NALS
	See para (d)5., (d)6. and (d)10. about RVR < 750m				
	CAT A-C	CAT D	CAT A-D	CAT A-D	CAT A-D
DH (ft)	RVR metres				
100-120	350	400	450	600	700
121-140	400	450	500	600	700
141-160	450	500	500	600	750
161-199	450	500	550	650	750

Example of approach light abbreviations and a table concerning the impact of failed equipment on the approach capability in general:

Approach light systems

OPS Class of Facility	Length, configuration and intensity of approach lights
FALS (full approach light system)	ICAO: Precision approach CAT I Lighting System (HIALS 720 m ≥) distance coded centreline, Barrette centreline
IALS (intermediate approach light system)	ICAO: Simple approach lighting system (HIALS 420-719 m) single source, Barrette
BALS (basic approach light system)	Any other approach lighting System (HIALS, MIALS or ALS 210-419 m
NALS (no approach light system)	Any other approach lighting system (HIALS, MIALS or ALS < 210 m) or no approach lights

FAILED OR DOWNGRADED EQUIPMENT	EFFECT ON LANDING MINIMA				
	CAT III B (Note 1)	CAT III A	CAT II	CAT I	NON PRECISION
Approach lights	Not allowed for operations with DH > 50 ft		Not allowed	Minima as for nil facilities	
Approach lights except the last 210 m	No effect		Not allowed	Minima as for nil facilities	
Approach lights except the last 420 m	No effect			Minima as for intermediate facilities	
Standby power for approach lights	No effect				No effect
Whole runway light system	Not allowed			Day - Minima as for nil facilities Night - Not allowed	
Edge lights	Day only; Night - not allowed				
Centreline lights	Day - RVR 300 m Night - not allowed		Day - RVR 300 m Night - 550 m	No effect	
Centreline lights spacing increased to 30 m	RVR 150 m	No effect			
Touch Down Zone lights	Day - RVR 200 m Night - 300 m	Day - RVR 300 m Night - 550 m		No effect	
S`tandby power for runway lights	Not allowed			No effect	
Taxiway light system	No effect - except delays due to reduced movement rate				

3.2.5 LVO Visibility Conversion TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-A8.1-025 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 8.1.3 “Conversion of reported meteorological visibility to RVR/CMV” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is there a table to convert reported meteorological visibility to RVR/CMV?

☐ Are the conditions/ restrictions to convert reported meteorological visibility to RVR/CMV correctly mentioned?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The paragraph shall describe what RVR/CMV is, and how reported meteorological visibility can be converted to RVR/CMV correctly.
- The following table shall be available

Lighting elements in operation	RVR/CMV = reported meteorological visibility multiplied by the factor below	
	Day	Night
HI approach and runway lighting	1,5	2,0
Any type of lighting installation other than above	1,0	1,5
No lighting	1,0	N/A

- It shall be mentioned that the CMV shall not be used for:
  - take-off;
  - for calculating any other required RVR minimum less than 800m (e.g. for Approach);
  - when reported RVR is available

3.2.6 LVO Approach Minima with EVS TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-A8.1-030 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 8.1.3 “Reduction of calculated RVR/CMV when utilising EVS” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is there a table to calculate the required RVR/CMV when using EVS?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Example:

RVR/CMV normally required [m]	RVR/CMV for approach using EVS [m]
550	350
600	400
650	450
700	450
750	500
800	550
900	600
1000	650
1100	750
1200	800
1300	900
1400	900
1500	1000
1600	1100
Cont.	
5000	3300

3.2.7 LVO Approach Considerations TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-A8.4-035 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 8.4 “Low Visibility Operations” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

- ☐ Are the visual references at the minimum defined?
- ☐ Is the malfunction handling during an LVO approach defined?
- ☐ Are stabilisation criteria defined?
- ☐ Is there information how to apply different RVR readings along a landing runway?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Visual references Lower than Standard CAT I:

- A segment of at least three consecutive lights being the centre line of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained. This visual reference must include a lateral element of the ground pattern, i.e. an approach lighting crossbar or the landing threshold or a barrette of the touchdown zone lighting unless the operation is conducted using an approved HUDLS usable to at least 150 ft.

Visual references CAT II and other than standard CAT II:

- a segment of at least 3 consecutive lights being the centre line of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained. This visual reference must include a lateral element of the ground pattern, i.e. an approach lighting crossbar or the landing threshold or a barrette of the touchdown zone lighting unless the operation is conducted using an approved HUDLS to touchdown.

Visual references CAT III:

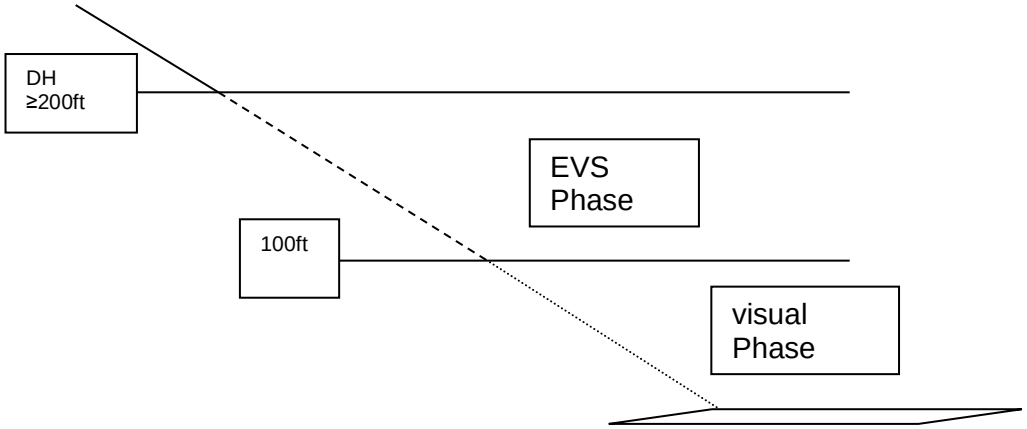
- For Category III A operations and for Category III B operations conducted either with fail-passive flight control systems, or with the use of an approved HUDLS, a pilot may not continue an approach below the decision height unless a visual reference containing a segment of at least three consecutive lights being the centre line of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained.
- For Category III B operations conducted either with fail-operational flight control systems or with a fail-operational hybrid landing system (comprising e.g. a HUDLS) using a decision height a pilot may not continue an approach below the decision height unless a visual reference containing at least one centre line light is attained and can be maintained.

Visual references using EVS:

The required visual references during an approach using EVS are dependent on the type of approach and the approach phase. Utmost attention must be given to clearly describe and define the required visual references for the cockpit crew (PF and PNF). Especially, if only one pilot has the EVS picture available during approach (e.g. EVS combined with HUD).

The following picture will give you an example:

ILS, MLS, PAR, GLS and APV Operations with a DH no lower than 200ft



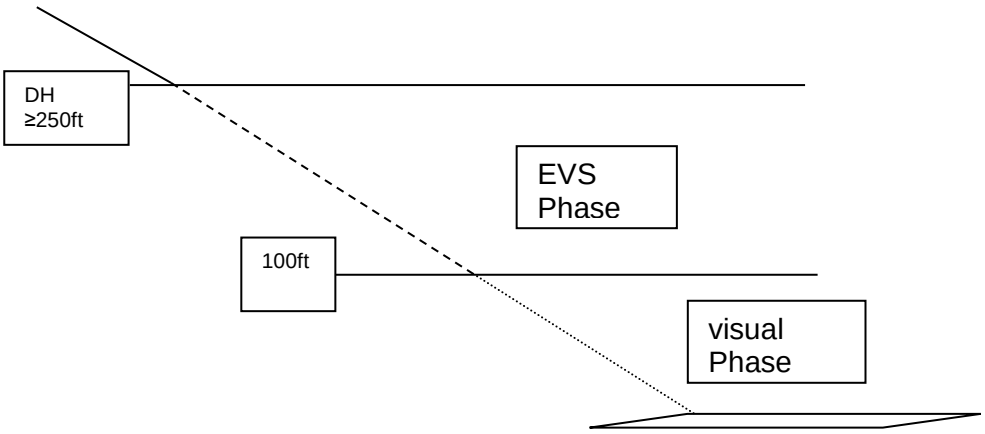
EVS Phase:

- A pilot using an enhanced vision system certified for the purpose of this paragraph and used in accordance with the approved procedures and limitations, may:
- continue an approach below DH or MDH to 100 feet above the threshold elevation of the runway provided that at least one of the following visual references is displayed and identifiable on the enhanced vision system:
  - elements of the approach lighting; or
  - the runway threshold, identified by at least one of the following:
  - the beginning of the runway landing surface, the threshold lights, the threshold identification lights;
  - and the touchdown zone, identified by at least one of the following:
  - the runway touchdown zone landing surface, the touchdown zone lights, the touchdown zone markings or the runway lights.

Visual Phase:

- A pilot may only continue an approach below 100 feet above runway threshold elevation for the intended runway, if at least one of the visual references specified below is distinctly visible and identifiable to the pilot without reliance on the enhanced vision system:
  - The lights or markings of the threshold; or
  - The lights or markings of the touchdown zone.

Approach flown, using approved vertical flight path guidance to a MDA or DH no lower than 250ft



EVS Phase:

- A pilot using an enhanced vision system certified for the purpose of this paragraph and used in accordance with the approved procedures and limitations, may:
- continue an approach below DH or MDH to 100 feet above the threshold elevation of the runway provided that at least one of the following visual references is displayed and identifiable on the enhanced vision system:
  - elements of the approach lighting; or
  - the runway threshold, identified by at least one of the following:
  - the beginning of the runway landing surface, the threshold lights, the threshold identification lights;
  - and the touchdown zone, identified by at least one of the following:
  - the runway touchdown zone landing surface, the touchdown zone lights, the touchdown zone markings or the runway lights

Visual Phase:

- A pilot may only continue an approach below 100 feet above runway threshold elevation for the intended runway, if at least one of the visual references specified below is distinctly visible and identifiable to the pilot without reliance on the enhanced vision system:
  - The lights or markings of the threshold; or
  - The lights or markings of the touchdown zone.

3.2.8 Occurrences during LVO TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-A11-040 CL Ch.-OM Ch.-Seq.-No.	OM – A Chapter 11 “Handling of Accidents and Incidents” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ How are unsuccessful LVO approaches reported?

☐ How are successful LVO approaches reported?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Occurrences during LVO successful and unsuccessful LVO approaches must be reported. Therefore, a reporting tool must be defined and published.

This can be done with either a special LVO reporting form or by the regular crew report and the Tech Log/ Flight Log system, in order to allow a collection of statistical data.

An approach may be considered to be successful if:

- From 500 feet to start of flare:
  - Speed is maintained as specified in ACJ-AWO 231, paragraph [2 ‘Speed Control’]; and
  - No relevant system failure occurs; and
- From 300 feet to DH:
  - No excess deviation occurs; and
  - No centralised warning gives a go-around command (if installed).

An automatic landing may be considered to be successful if:

- No relevant system failure occurs
- No flare failure occurs
- No de-crab failure occurs (if installed)
- Longitudinal touchdown is beyond a point on the runway 60 meters after the threshold and before the end of the touchdown zone lighting (900 metres from the threshold).
- Lateral touchdown with the outboard landing gear is not outside the touchdown zone lighting edge.
- Sink rate is not excessive
- Bank angle does not exceed a bank angle limit
- No roll-out failure or deviation (if installed) occurs.

3.2.9 LVO Aeroplane Information TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-B0-045 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 0 “General” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are the aeroplane specific LVO values correct and consistent listed in the Chapter 0?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The requested/certified LVO values must be listed in the general part where all the operations specifications are listed.

3.2.10 LVO Aeroplane Limitations TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-B1-050 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 1 “Limitations” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are the certification limitations of the aeroplane correct and listed in the OM B Chapter 1 “Limitations”?

☐ Are the EVS Limitations listed in the OM B Chapter 1 “Limitations”?

☐ Are the HUDLS Limitations listed in the OM B Chapter 1 “Limitations”?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The requested/certified limitations concerning the LVO must be listed in the OM B (e.g. autopilot limitations, auto thrust limitations, wind limitations, required configurations etc.).
- All Limitations concerning „AWO Systems” (e.g. HUDLS; EVS etc) must be completely listed. The described Limitations must be according to the aeroplane specific EASA AFM, which must be sent to FOCA for the approval process (copies).

3.2.11 LVO Normal Procedures Description TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-B2-055 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 2 “Normal Procedures” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

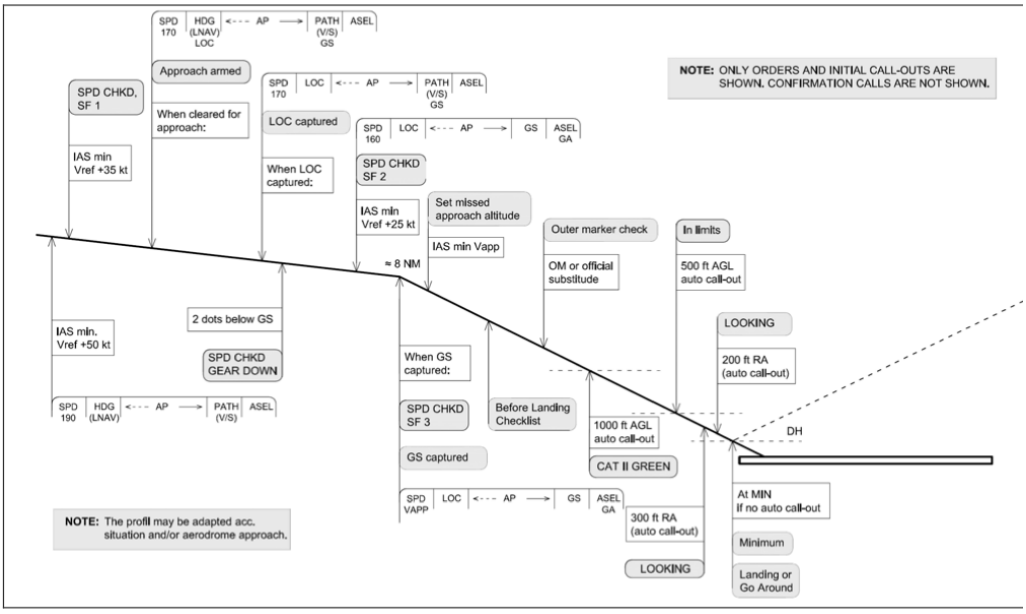
☐ Has the operator defined operational procedures to ensure Low Visibility Operations are conducted according to defined criteria (OM A, 8.4)?

☐ Is defined what equipment must be operable before commencing an approach?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- Chapter 2 must contain complete and consistent flight profiles and crew station duty assignments. This must include task distribution, call outs, configurations and speeds. In case of an auto-land, also the landing and roll out must be described.

Example of flight profiles:



An information for the crewmember must be available (ideally in form of a table) to define the required equipment operable before commencing the different low visibility approaches. The information shall also contain the information to which point in the approach the equipment must be operable (e.g. commencing the approach OEI is allowed, engine failure after approach status results in a G/A ✈ according AFM!).

Example: Crew station duty assignment for CAT II approach:

		PNF (CMD)		PF (co-pilot)	
POF	**Condition/Event**	**Call** **Response**	**Task/Action**	**Call** **Response**	**Task/Action**
	Before commencing the approach check following: • Secondary Flight Display ..... Checked • Radio-altimeters ..... Tested • RA DH ..... Set in FMW (CAT 2) – displayed on both ADI • ILS frequency ..... Set on both sides • Course ..... Selected and CDI VOR displayed on both sides				
INTERMEDIATE APPROACH	Glideslope alive and IAS between 200 kt and V_{REF} + 50 kt). Target IAS: 190 kt	**SPEED CHECKED**	After checking max. speed change configuration and monitors indication	**SPEED CHECKED, SF 1**	
	When indication is at SF 1 Target IAS: 170 kt	**SF 1**		**CHECKED**	
	When cleared for ILS-approach	**LOC / GS ARMED**	Verifies FMA annunciation	**APP ARMED**	Arms APP and verifies mode annunciation
INTERMEDIATE APPROACH	Lateral mode change and line-up of A/C on centreline	**CHECKED**		**LOC CAPTURED**	
	2 dots below GS and IAS < 200 kt		Selects gear lever to down and monitors gear indication	**SPEED CHECKED – GEAR DOWN**	
	When 3 green transition lights are checked to be on	**GEAR DOWN, 3 GREENS**	Verifies gear indication	**CHECKED**	Verifies gear indication
	1 dot below GS and IAS < 190 kt and min: V_{REF} + 35 kt.	**SPEED CHECKED**	After checking max. speed change configuration and monitors indication	**SPEED CHECKED, SF 2**	
	When indication is at SF 2 Target IAS: 160 kt	**SF 2**		**CHECKED**	
	Before intercepting glide slope		Checks position with distance and altitude to ensure correct glide slope indication		Checks position with distance and altitude to ensure correct glide slope indication
	Before GS capturing and IAS < 180 kt and min: V_{REF} + 25 kt.	**SPEED CHECKED**	After checking max. speed change configuration and monitors indication	**SPEED CHECKED, SF 3**	
	When indication is at SF 3 Target IAS: V_{APP}	**SF 3**		**CHECKED**	
FINAL APPROACH	Vertical mode change on FMA	**CHECKED**		**GS CAPTURED**	
	Pre-selection of missed approach altitude	**MISSED APRPOACH ALTITUDE SET**	Pre-selects missed approach altitude	**SET MISSED APPROACH ALTITUDE**	Verifies setting
FINAL APPROACH	Final configuration is set	**BEFORE LANDING CHECKLIST COMPLETED**	Applies before landing checklist	**BEFORE LANDING CHECKLIST**	Verifies system status
	Passing outer marker or latest 1'000 ft AAL	**OUTER MARKER CHECK COMPLETED**	performs OM check according 2.6.2.9 Checks altitude on both PFD with corresponding QNH / QFE	**OUTER MARKER CHECK**	
	At 1'000 ft RA (auto-call)	**CAT II GREEN**	Crosschecks RA and confirms CAT 2 green in ADI	**CAT II GREEN**	Crosschecks RA and confirms CAT 2 green in ADI
	At 500 ft RA (auto-call)	**IN LIMITS**	Checks primary deviations, airspeed, no flags in ADI	**IN LIMITS**	Checks primary deviations, airspeed, no flags in ADI
	At 300 ft RA (auto-call)	**LOOKING**	Looks out for visual references	**CHECKED**	Monitors instrument
	At 200 ft RA (auto-call)	**LOOKING**	Looks out for visual references	**APPROA-CHING MINIMUM** (only if necessary)	Monitors instrument
	Latest at DH	**LANDING** or **GO AROUND**	Checks for visual references. Takes control and lands the aeroplane or orders go-around	**MINIMUM** **YOUR CONTROLS** or **GO AROUND**	Monitors altitude Gives control to PIC or performs go-around

3.2.12 LVO Normal Procedures & Equipment TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-B2-060 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 2 “Normal Procedures” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are the procedures for LVO approaches with EVS defined?

☐ Is there a statement that a Lower than Standard CAT I approach must be flown with HUDLS or auto-couplet and auto-land?

☐ Is defined what equipment must be operable before commencing an approach?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- Chapter 2 must contain complete and consistent flight profiles and crew station duty assignments for the approaches flown with EVS. Special attention must be given to the decision phase, the continuation phase and the transition from the artificial picture to the visual phase. Detailed flight profiles and crew station duty assignments must be described in regard to the required visual references, decision making (see LVO Approach considerations).
- An information for the crewmember must be available (ideally in form of a table) to define the required equipment operable before commencing the different low visibility approaches. The information shall also contain the information to which point in the approach the equipment must be operable (e.g. commencing the approach OEI is allowed, engine failure after approach status results in a G/A ✈ according AFM!).
- The procedure for a Lower than Standard CAT I approach must clearly describe, that such an approach must be flown either with HUDLS or auto-couplet with auto-land.

3.2.13 LVO Abnormal Procedures TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-B3-065 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 3 “Abnormal Procedures” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are the abnormal procedures during LVO approaches defined?

☐ When must a G/A initiated?

☐ Is there a different configuration used than in the normal procedures?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The Chapter 3 must contain complete and consistent information about abnormal procedures for LVO (what if…).

The description shall include all relevant information to flight crew to determine if an approach can be commenced, continued or shall be aborted. It shall give appropriate information on the action to be taken by the crew.

All relevant information from the AFM must be reflected.

3.2.14 LVO Integration into MEL TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-B8-070 CL Ch.-OM Ch.-Seq.-No.	OM – B Chapter 8, Minimum Equipment List MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is the entire LVO integrated in the MEL?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The MEL shall be updated with all LVO relevant items.

The Commander of an aeroplane must have the tool for verification of LVO capability of an aeroplane before flight.

3.2.15 LVO Aerodrome Operation Considerations TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-C1-075 CL Ch.-OM Ch.-Seq.-No.	OM – C Chapter 1.X MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ How is the LVO capability of an aerodrome verified?

☐ How can the Operator verify the low visibility procedures of an aerodrome?

☐ How does the Operator determine and verify the applicable minimum when using EVS?

☐ How does the Operator determine and verify the applicable minimum RVR in case of lower than standard CAT I (LTS)?

☐ How does the Operator determine and verify the applicable minimum RVR in case of other than standard CAT II (OTS)?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- An operator shall not use an aerodrome for Category II or III operations unless the aerodrome is approved for such operations by the State in which the aerodrome is located.
- An operator shall verify that low visibility procedures (LVP) have been established, and will be enforced, at those aerodromes where low visibility operations are to be conducted.
- An Operator shall ensure that the Approach facility used for a Lower than Standard CAT I, is sufficient
  - Class I/T/1 for operations to a minimum of 450m RVR; or
  - Class II/D/2 for operations to less than 450m RVR.
  - Single ILS facilities are only acceptable if Level 2 performance is provided.
- An operator shall ensure that the approach facilities used for an Other than Standard CAT II, are sufficient and the minima are determined according to the available facilities.

3.2.16 LVO Aerodrome Information Publications TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.MLR.101	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-C1-080 CL Ch.-OM Ch.-Seq.-No.	OM – C Chapter 1.X MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

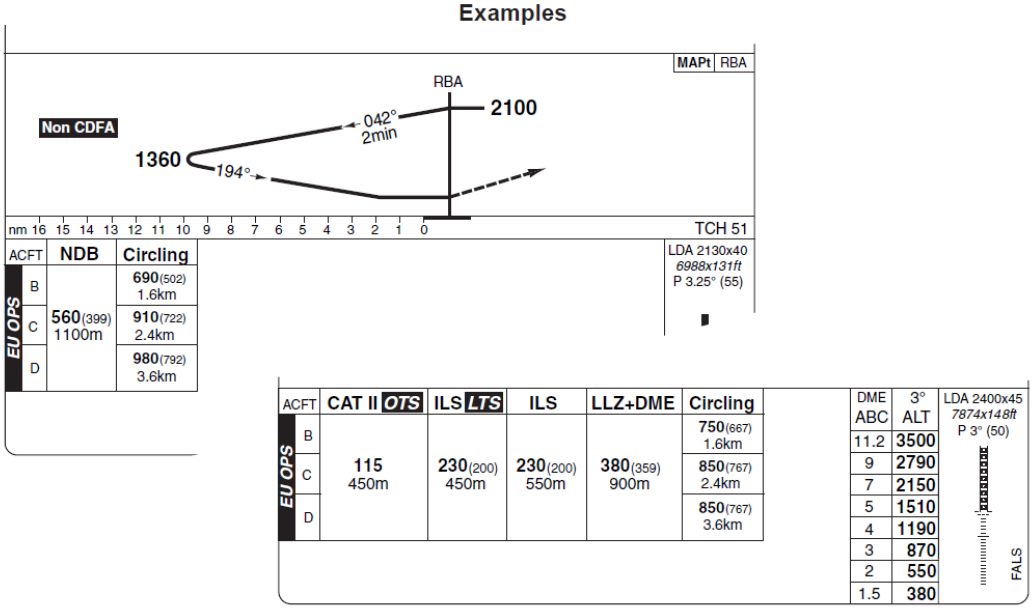
☐ How are the approach minima for Lower than Standard (LTS) CAT I considered and published?

☐ How are the approach minima for other than Standard (OTS) CAT II considered and published?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The Operator is responsible for the published approach minima. If the operator uses a subcontractor (chart supplier, e.g. Jeppesen, EAG, Lido etc), the final responsibility must be traceable defined. The tailoring of Charts is in the operator's responsibility.
- The presentation of the approach minima must be in such a way that it is clearly distinguishable for the crewmember, if it is a standard or other than standard minima. Several chart suppliers published examples and descriptions on how the approach minima is published.

Examples



3.2.17 LVO Training

3.2.17.1 Training Course Documentation

It is recommended that the operator constructs modules within its training system covering the needs of the whole spectrum of operations specifications (OPS specs) and Low visibility operation. In this context the operator is invited to define the appropriate training modules for the key courses “Conversion course”, “Command course” and “Recurrent training and Checking”. The nominated person for Crew Training of the Organisation is responsible to build and maintain the training modules covering the subject of low visibility operation. Modules should be structured for adequate sameness which allows easy interpretation of the content.

3.2.17.2 The making of Training Modules

Before producing a training module for low visibility operation, the operator is advised to observe below listed points as general guidance.

- It should be clearly stated where training is to take place including description of venue/training facility for in-house training or if the latter is outsourced (subcontractor training venue);
- Required minimum competence/function of training and checking personnel shall be listed within each training module;
- The module shall be clearly defined, stating scope, purpose and required time of specific training;
- A reference to the qualification Requirements as stated within the OM A, Chapter 5 shall be integrated;
- A minimum standard of performance must be defined for every module;
- Conditions, Prerequisites and Requirements associated to the privileges of completed training and checking must be listed;
- Defined lessons shall be clearly listed showing steps and items to be checked, lesson targets;
- Reference to subcontractor, listed in OM D, Chapter 1.2;
- Reference to syllabi and lesson plans (for training conducted in-house);

3.2.17.3 Standard of performance in training and checking

To ensure an adequate level in theoretical and practical training, the operator shall define, within the respective Training module, a minimum standard of performance in regard to the topic concerned which shall be used to check and document performance of the respective trainee. The minimum standard of performance shall describe to which level the trainee shall be capable of producing learned material e.g.: The trainee knows all the applicable limitations regarding low visibility operation, by heart.

3.2.17.4 Training facilities TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.MLR.101	ORO.FC.145	SPA.LVO.100	SPA.LVO.120
3-D1-085 CL Ch.-OM Ch.-Seq.-No.	OM-D, Chapter 1.2.X “Training facilities” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ What training facilities are used to conduct the LVO training?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The applicant shall list all training facilities with details where he intends to conduct the LVO training, also if the training will be conducted with a subcontracted facility or another operator.
  - If the training facility and training device is already listed in the OM D, a correct reference is sufficient.
  - If an additional training facility is used, all details such as address, STD ID etc. shall be listed.
  - An additional training facility/ training equipment might require an user approval. Please check, if such an approval exists beforehand.

3.2.17.5 Training & Checking within the "Key Courses" TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	ORO.FC.120	ORO.FC.130	ORO.FC.205
3-D2-090 CL Ch.-OM Ch.-Seq.-No.	OM-D, Chapter 2.1.X "Training Syllabi and Checking Programme" MANUAL REFERENCE				

APP: The Training Programme must be approved to the Authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is the subject LVO implemented in the Operations Manual Part D chapter 2.1 Flight Crew?

☐ Is practical and theoretical training implemented within the "key courses" as listed below?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

"Key Courses" Matrix				Training required	Checking required
Phase	Ground and FSTD / Airplane Training	**Conversion Training and Checking** covering: • Conversion Course changing operator • Conversion Course changing ACFT type / Class rating • Conversion Course changing operator and ACFT type / class rating		Yes (see Note)	Yes
	FSTD / Airplane Training	**Command Course**		Yes (see Note)	Yes
		Recurrent Training and Checking	• LPC	N/A	No
			• OPC		Yes
			• Line Check		No
			• Recurrent training	Yes	Yes
		Difference and familiarization Training		Yes (see Note)	Yes
		Recent Experience		Yes	No
		In Flight Relief of Flight Crew Members Training		N/A	

Note: It is assumed that all Pilots (CMD and F/O) shall be qualified to conduct LVO

3.2.17.6 LVO Conversion Training and Checking TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	ORO.FC.120	SPA.LVO.100	SPA.LVO.120
3-D2-095 CL Ch.-OM Ch.-Seq.-No.	OM-D, Chapter 2.1.X “Training Syllabi and Checking Programme” MANUAL REFERENCE				

APP: The Training Programme must be approved to the Authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

- ☐ Has the operator defined a LVO Training module for conversion training?
- ☐ Does the training module consider individual LVO experience?
- ☐ Does the OM D, Chapter 2 define theoretical and practical training and checking
- ☐ Is this training designed to meet the criteria required for crew members without CAT II / III experience?
- ☐ Is this training designed to meet the criteria required for those with CAT II/III experience with a similar type of operation (auto-coupled/auto-land, HUDLS/Hybrid HUDLS or EVS) or Category II with manual land if appropriate with another Community operator?
- ☐ Is this training designed to meet the criteria required for those crew members with CAT II/III experience with the operator?
- ☐ Does the Ground Training reflect the minimum requirements as defined AMC1 SPA.LVO.120 (b)
- ☐ Does the Simulator Training cover the minimum requirements as defined in AMC1 SPA.LVO.120 (c) and are the requirements covered in the Proficiency Check?
- ☐ Has the Operator defined the requirements related to type and command experience?
- ☐ Are the different steps (completeness / sequence) tracked and documented?
- ☐ Is there coordination with FOCA/SBOC in progress regarding the operational demonstration, if applicable?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The key courses (conversion course changing type, conversion course changing aeroplane and conversion course changing type and aeroplane) shall contain an appropriate LVO training module and must be based on the Operator’s Procedures laid down in the respective OM B.

The operator shall ensure that each flight crew member completes the following low visibility procedures training if converting to a new type/class or variant of aeroplane in which lower than Standard Category I, Other than Standard Category II, Approach utilising EVS with an RVR of 800m or less and Category II and III Operations will be conducted.

The training must be defined to comply with the Operator’s philosophy for such operation (e.g. “monitored approach principle”). Consequently, special attention must be paid to adherence of each crew member to his defined role.

The training must emphasise on proper work distribution related to each crew station, workload management, duties, responsibilities and appropriate (defined) call-outs during approach, flare, roll-out and GA / missed approach. Special emphasis shall be laid on critical phases such as the transition from non-visual to visual conditions.

Training on procedures in deteriorating visibility, handling of failures and pilot incapacitation during critical phases must be included and shall follow the training phase containing normal operation.

The level of flight crew experience must be considered when determining the extensiveness of the training.

- Flight crew members with no Category II or Category III experience must complete the full training programme according AMC1 SPA.LVO.120 (b)(c)(d).
- Flight crew members with Category II or Category III experience with a similar type of operation (auto-coupled/auto-land, HUDLS/Hybrid HUDLS or EVS) or Category II with manual land if appropriate with another Community operator may undertake an abbreviated training according AMC1 SPA.LVO.120 subparagraphs (a)(2).
- Flight crew members with Category II or Category III experience with the operator may undertake an abbreviated ground, Flight simulator and/or flight training course. The abbreviated course is to include the elements according AMC1 SPA.LVO.120 subparagraphs (a)(3).

The required training is divided into:

- Ground Training. according AMC1 SPA.LVO.120 (b)
- Flight simulator training and/or flight training according AMC1 SPA.LVO.120 (c)
  - A minimum of six (eight for HUDLS with or without EVS) approaches and/or landings in a flight simulator. The requirements for eight HUDLS approaches may be reduced to six when conducting Hybrid HUDLS operations.
  - Where no flight simulator is available to represent that specific aeroplane, a minimum of three (five for HUDLS and/or EVS) approaches including at least one go-around is required on the aeroplane. For Hybrid HUDLS operations a minimum of three approaches are required, including at least one go-around.
  - Appropriate additional training if any special equipment is required such as head-up displays or enhanced vision equipment. When approach operations utilising EVS are conducted with an RVR of less than 800m, a minimum of five approaches, including at least one go-around are required on the aeroplane.

- Flight crew qualification.
  The flight crew qualification requirements are specific to the operator and the type of aeroplane operated.
  - The operator must ensure that each flight crew member completes a check before conducting Category II or III operations.

The OM D shall provide a logical structure of the different training phases and shall consist of:

- Ground Training
- Simulator Training (terminated by a Proficiency Check to include all Low visibility procedures).
- Line Flying under Supervision (LIFUS)
- Type and command experience according AMC1 SPA.LVO.120 (e)

The OM D must specify the scope of the training and checking required for:

a) Flight Crew Members with no CAT II / III experience (full training programme required)

b) Flight Crew Members with CAT II / III experience with a similar type of operation with another Operator (abbreviated ground course).

c) Flight Crew Members with CAT II / III experience with the same Operator (abbreviated ground, simulator and flight training).

The Operator's OM D must specify in detail the elements to be covered for a), b) and c) above.

Example for "Standard of Performance":

- The flight crew member shall demonstrate his ability to perform Low Visibility Operation satisfactorily according to the procedures defined in the OM B.
- The crewmember shall be enabled to evaluate Meteorological Conditions and available aircraft and ground equipment and to take appropriate decisions regarding commencement and continuation of an approach.

Instructor Requirements:

- Ground Training: suitably qualified GI
- Simulator Training: TRI (qualified on type and for the respective low visibility operations)

Proficiency Check:

- TRE

In case of initial LVO Application (e.g. AOC variation), the LVO Training in the Simulator shall be coordinated with FOCA in order to simplify the operational demonstration process.

3.2.17.7 **Additional Training for LTS, OTS and/or the use of EVS** TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	CAT.OP.MPA.110	SPA.LVO.100	SPA.LVO.120
3-D2-100 CL Ch.-OM Ch.-Seq.-No.	OM-D, Chapter 2.1.X “Training Syllabi and Checking Programme” MANUAL REFERENCE				

APP: The Training Programme must be approved by the Authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Has the operator established a training/ qualification programme covering Lower than Standard CAT I approaches?

☐ Has the operator established a training/ qualification programme covering approaches using EVS?

☐ Has the operator established a training/ qualification programme covering other than Standard CAT II approaches?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- Operators conducting lower than Standard Category I operations shall comply with the provisions of AMC1 SPA.LVO.120 — low visibility operations — training and qualifications applicable to Category II operations to include the requirements applicable to HUDLS (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be additional to the requirements of Subpart FC of Annex III (ORO.FC) provided the training is conducted utilising the lowest applicable RVR. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met, provided that at least one approach using lower than Standard Category I minima is conducted at least once every 18 months.
- Operators conducting other than Standard Category II operations shall comply with the provisions of AMC1 SPA.LVO.120 — low visibility operations — training and qualifications applicable to Category II operations to include the requirements applicable to HUDLS (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be less than that required to complete Category II training using a HUD/HUDLS. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met, provided that at least one approach using other than Standard Category II minima is conducted at least once every 18 months.
- Operators conducting approach operations using EVS with RVR of 800 m or less shall comply with the provisions of AMC1 SPA.LVO.120 — Low Visibility Operations — Training and Qualifications applicable to Category II operations to include the requirements applicable to HUD (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be less than that required to complete Category II training utilising a HUD. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met, provided that at least one approach using EVS is conducted at least once every 12 months.

3.2.17.8 LVO Training during LIFUS TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	ORO.FC.120	SPA.LVO.100	SPA.LVO.120
3-D2-105 CL Ch.-OM Ch.-Seq.-No.	OM – D 2.1.X “Conversion Training/ LIFUS” MANUAL REFERENCE				

APP: The Training Programme must be approved to the Authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Are Lower than Standard CAT I, Other than Standard CAT II, CAT II / III approaches integrated into LIFUS?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

For Category II operations, when a manual landing or a HUDLS approach to touchdown is required, a minimum of:

- three landings from autopilot disconnect;
- four landings with HUDLS used to touchdown; except that only one manual landing (two using HUDLS to touchdown) is required when the conversion training has been carried out in a flight simulator qualified for zero flight time conversion

For Category III operations, a minimum of two automatic landings are required, except that:

- only 1 autoland is required when the conversion training has been carried out in a flight simulator qualified for zero flight time training;
- no autoland is required during LIFUS when the conversion training has been carried out in a flight simulator qualified for zero flight time training (ZFTT) and the flight crew member has successfully completed the ZFTT conversion course

The flight crew member, trained and qualified in accordance with point above, is qualified to operate during the conduct of LIFUS to the lowest approved DA(H) and RVR as stipulated in the Operations Manual.

For Category III approaches using HUDLS to touchdown a minimum of four approaches.

3.2.17.9 **LVO Recurrent Training and Checking** TOPIC					M / CC EVALUATION METHOD
LVO CL TOPIC	ORO.MLR.100 LEGAL REFERENCE	ORO.FC.145	ORO.FC.130	SPA.LVO.100	SPA.LVO.120
3-D2-110 CL Ch.-OM Ch.-Seq.-No.	OM – D 2.1.X “Recurrent Training and Checking” MANUAL REFERENCE				

APP: The Training Programme must be approved by the Authority

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Has the operator established a Training module for recurrent LVO Training?

☐ Does the OM D, Chapter 2 define the required minimum training and checking in compliance with AMC1 SPA.LVO.120?

☐ How does the Operator ensure that each crewmember performs the minimum of approaches during the validity period of the OPC?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- The recurrent training and checking for CAT II/III operations must be based on the Operator’s Procedures laid down in the respective OM B.
- The training/ checking must emphasis on proper distribution of the flight crew station, workload management, duties, responsibilities and appropriate call-outs during approach, flare, roll-out and GA / missed approach.
- Special emphasis shall be laid on critical phases such as transition from non-visual to visual conditions and on procedures in deteriorating visibility, the handling of failures as well as detection of / response on pilot’s incapacitation.
- An operator must ensure that in conjunction with the normal recurrent training and operator proficiency checks, a pilot’s knowledge and ability to perform the tasks associated with the particular category of operation, for which he/she is authorised is checked. The required number of approaches to be undertaken in the flight simulator within the validity period of the operators proficiency check (6 Months)is to be a minimum of:
  - two, (four when HUDLS and/or EVS is utilized to touchdown) one of which must be a landing at the lowest approved RVR;
  - in addition one (two for HUDLS and/or operations utilising EVS) of these approaches may be substituted by an approach and landing in the aeroplane using approved Category II and III procedures.
  - One missed approach shall be flown during the conduct of the operators proficiency check.

The Training shall be defined in the appropriate module.

Example of Standard of Performance:

- The flight crew member shall demonstrate his ability to perform Low Visibility Operation satisfactorily according to the procedures defined in the Operations Manual.
- The crewmember shall be enabled to evaluate Meteorological Conditions and available aircraft and ground equipment and to take appropriate decisions regarding commencement and continuation of an approach.

Instructor Requirements:

- Simulator Training: TRI (qualified on type and for CAT II / III operations)

Proficiency Check:

- TRE

3.3. Operational Demonstration

The extensiveness of the operational demonstration is depending on various criteria and is on the authorities' discretion.

The LVO procedures shall be demonstrated by the operator to the satisfaction of the competent certification authorities. This shall be done in the simulator used for the LVO training/checking and is part of the operational demonstration.

3.3.1 Number of Approaches TOPIC		M / CC EVALUATION METHOD
LVO CL TOPIC	SPA.LVO.105 CS-AWO LEGAL REFERENCE	
3-OD-115 CL Ch.-OM Ch.-Seq.-No.	MANUAL REFERENCE	

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is the extensiveness of the operational demonstration defined by FOCA?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

The purpose of the operational demonstration is to determine or validate the use and effectiveness of the applicable aircraft flight guidance systems (incl HUDLS if appropriate), training, flight crew procedures, maintenance programme, and manuals applicable to the LVO programme being approved. Demonstrations may be conducted in line operations or any other flight where the Operator's procedures are being used.

- At least 30 approaches and landings must be accomplished in operations using the Category II/III systems installed in each aircraft type if the requested DH is 50 ft or higher. If the DH is less than 50 ft, at least 100 approaches and landings will need to be accomplished unless otherwise approved by the Authority.
- If an operator has different variants of the same type of aircraft using the same basic flight control and display systems, or different basic flight control and display systems on the same type of aircraft, the operator must show that the various variants have a satisfactory performance, but the operator need not to conduct a full operational demonstration for each variant. The Authority may also accept a reduction of the number of approach and landings based on credit given for the experience gained by another operator with an AOC using the same aeroplane type or variant and procedures.

Note: Not more than 30% of the demonstration flights should be made on the same runway.

Following values are used as a general guideline:

Operator <u>without</u> previous CAT II/ III experience	
Type / DH	**new airplane or new operator**
Cat I	6 months *
Lower than Standard Cat I	30 app.
Cat II/ Other than Standard Cat II	30 app.
Cat IIIA - <100ft but >= 50ft	30 app.
Cat IIIB - <100ft but >= 50ft	6 months */ 30 app.
Cat IIIB - < 50ft	6 months */ 100 app.
Cat IIIB - 0ft	6 months */ 100 app.

* = transition period app = approaches

Operator <u>with</u> previous CAT II/III experience					
Type / DH	**new airplane and/or new to FOCA**	**new variant / new flight control /display system**	**change from coupled approach to manually flown with HUDLS**	**new airplane and known FOCA**	**Transition from Cat II to Cat III**
Cat I	N/A	N/A	N/A	N/A	N/A
Lower than Standard Cat I	30 app.	15 app.	30 app.	20 app.	N/A
Cat II/ OTS Cat II	30 app.	15 app.	30 app.	20 app.	N/A
Cat IIIA - <100ft but >= 50ft	30 app.	15 app.	30 app.	20 app.	15 app.
Cat IIIB - <100ft but >= 50ft	30 app.	15 app.	30 app.	20 app.	15 app.
Cat IIIB - < 50ft	100 app.	30 app.	30 app.	50 app.	30 app.
Cat IIIB - 0ft	100 app.	30 app.	30 app.	50 app.	30 app.

Note: HUDLS and EVS are considered as “new display systems”.

3.3.2 Data Collection for Operational Demonstrations TOPIC		M / CC EVALUATION METHOD
LVO CL TOPIC	SPA.LVO.105 CS-AWO LEGAL REFERENCE	
3-OD-120 CL Ch.-OM Ch.-Seq.-No.	MANUAL REFERENCE	

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Does the data collection and analyse method satisfy the FOCA requirement?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- Each applicant must develop a data collection method (e.g. a form to be used by the flight crew) to record approach and landing performance. The resulting data and a summary of the demonstration data shall be made available to the Authority for evaluation.
- Data should be collected whenever an approach and landing is attempted using the Category II/III system, regardless of whether the approach is abandoned, unsatisfactory, or is concluded successfully.
- An operator must establish a procedure to monitor the performance of the automatic landing system or HUDLS to touchdown performance, as appropriate, of each aeroplane.

The data should as a minimum include the following information:

- Inability to initiate an Approach. Identify deficiencies related to airborne equipment which preclude initiation of a Category II/III approach.
- Abandoned Approaches. Give the reasons and altitude above the runway at which approach was discontinued or the automatic landing system was disengaged.
- Touchdown or Touchdown and Roll-out Performance. Describe whether or not the aircraft landed satisfactorily (within the desired touchdown area) with lateral velocity or cross track error which could be corrected by the pilot or automatic system so as to remain within the lateral confines of the runway without unusual pilot skill or technique. The approximate lateral and longitudinal position of the actual touchdown point in relation to the runway centreline and the runway threshold, respectively, should be indicated in the report. This report should also include any Category II/III system abnormalities which required manual intervention by the pilot to ensure a safe touchdown or touchdown and roll-out, as appropriate.

Note: If the number of unsuccessful approaches exceeds 5 % of the total (e.g. unsatisfactory landings, system disconnects) the evaluation programme must be extended in steps of at least 10 approaches and landings until the overall failure rate does not exceed 5 %.

Unsatisfactory approaches and/or automatic landings shall be documented and analysed.
Unsuccessful approaches due to the following factors may be excluded from the analysis:

- ATS Factors. Examples include situations in which a flight is vectored too close to the final approach fix/point for adequate localiser and glide slope capture, lack of protection of ILS sensitive areas, or ATS requests the flight to discontinue the approach.
- Faulty Navaid Signals. Navaid (e.g. ILS localiser) irregularities such as those caused by other aircraft taxiing, over-flying the Navaid (antenna).
- Other Factors. Any other specific factors that could affect the success of Category II/ III operations that are clearly discernible to the flight crew should be reported.

An approach may be considered to be successful, if:

- From 500 feet to start of flare:
  - Speed is maintained as specified in ACJ-AWO 231, paragraph [2 'Speed Control']; and
  - No relevant system failure occurs; and
- From 300 feet to DH:
  - No excess deviation occurs; and
  - No centralised warning gives a go-around command (if installed).

An automatic landing may be considered to be successful if:

- No relevant system failure occurs
- No flare failure occurs
- No de-crab failure occurs (if installed)
- Longitudinal touchdown is beyond a point on the runway 60 metres after the threshold and before the end of the touchdown zone lighting (900 metres from the threshold).
- Lateral touchdown with the outboard landing gear is not outside the touchdown zone lighting edge.
- Sink rate is not excessive
- Bank angle does not exceed a bank angle limit
- No roll-out failure or deviation (if installed) occurs.

3.3.3 Transition Periods for operators without previous CAT II/III experience TOPIC	M / CC EVALUATION METHOD
LVO CL TOPIC	SPA.LVO.105 CS-AWO LEGAL REFERENCE
3-OD-125 CL Ch.-OM Ch.-Seq.-No.	 MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ What can an operator without previous CAT II or CAT III experience apply for?

☐ What is the prerequisite/ transitional period for a CAT III B application?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- Without previous Category II or III operational experience an operator may be approved for Category II or IIIA operations, having gained a minimum experience of 6 months of Category I operations on the aeroplane type.
- On completing 6 months of Category II or III A operations on the aeroplane type the operator may be approved for Category III B operations. When granting such an approval, the Authority may impose higher minima than the lowest applicable for an additional period. The increase in minima will normally only refer to RVR and/or a restriction against operations with no decision height and must be selected such that they will not require any change of the operational procedures.

3.3.4 Transitional Periods for operators with previous CAT II/III experience TOPIC	M / CC EVALUATION METHOD
LVO CL TOPIC	SPA.LVO.105 CS-AWO LEGAL REFERENCE
3-OD-130 CL Ch.-OM Ch.-Seq.-No.	 MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ What can an operator with previous CAT II or CAT III experience apply for?

☐ What if the operator has changed approach procedures (auto-land/ manually flown) or equipment (HUDLS)?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- If previous Category II or III experience exists, the applicant may obtain authorisation for a reduced transition period by application to the Authority.
- If the operator was authorised for Category II or III operations using auto coupled approach procedures, with or without auto-land, and subsequently introducing manually flown Category II or III operations using a HUDLS will be considered to be a ‘New Category II/III operator’ for the purposes of the demonstration period provisions.

CL 4 Continuous Monitoring

4.1. Monitoring of LVO performance (TOPIC)		M / CC (EVALUATION METHOD)
LVO (CL TOPIC)	SPA.LVO.105 CS-AWO (LEGAL REFERENCE)	
4-CM-005 (CL Ch.-OM Ch.-Seq.-No.)	OM – A Chapter 3, SQMS, or Management System (MANUAL REFERENCE)	

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Does the SQMS / Management System describes and monitors the LVO performance?

☐ Is the actual LVO considered in the Tech Log/ Flight Log System?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

- After obtaining the initial authorisation, the operations must be continuously monitored by the operator to detect any undesirable trends before they become hazardous. Flight crew reports may be used to achieve this.
- The following information must be retained for a period of 12 months:
- The total number of approaches, by aeroplane type, where the airborne Category II or III equipment was used to make satisfactory, actual or practice, approaches to the applicable Category II or III minima; and Reports of unsatisfactory approaches and/or automatic landings, by aerodrome and aeroplane registration, in the following categories:
  - Airborne equipment faults
  - Ground facility difficulties
  - Missed approaches because of ATC instructions
  - Other reasons.

- An operator must establish a procedure to monitor the performance of the automatic landing system or HUDLS of each aeroplane.
- The Tech Log/ Flight Log System must contain the possibility of LVO reporting.

CL 5 Additional Information

5.1. Example Data Collection for Operational Demonstration

Auto-Approach and Auto-Land Performance

Aircraft Type _____

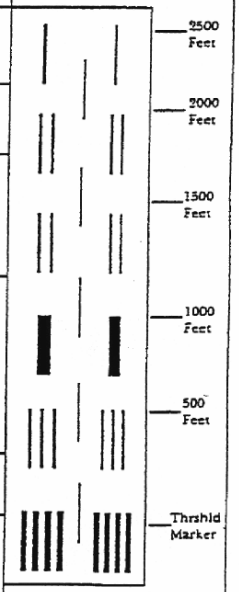
SECTION I. Complete All Items					
A/C #	Captain		Employee #	Flt #	Date
Airport	Runway	Conditions CAT I+ ☐ CAT II ☐ CAT III ☐	Wind Dir/Spd	ATC Runway Protection Provided ☐ Unknown or None ☐ CAT II	

The Auto-Approach Auto-Land was:

☐ Satisfactory ☐ Unsatisfactory

If unsatisfactory you must complete SECTION II

Auto-Land Touchdown Zone is 900 feet to 2400 feet down the runway, and within 27 feet of centerline.
Record Area of Touchdown with an X on Runway Depiction -----→



SECTION II. Complete ONLY if Auto-Approach or Auto-Land was UNSATISFACTORY

If the Approach was discontinued, it was due to:
☐ Airborne Equipment Failures
☐ Ground Facility Difficulties
☐ ATC Instructions
☐ Other (specify)

LOCALIZER (L/R) GLIDE SLOPE (H/L)

OUTER		MIDDLE		INNER	
☐ L R ☐	☐ H L ☐	☐ L R ☐	☐ H L ☐	☐ L R ☐	☐ H L ☐

If the autopilot was disconnected the altitude was _____ ft MSL

Other Comments: _____

_____

_____

_____

END of CL LVO