REFERENCE	INDICE	DATE
DGT153396	**1**	**29-01-2016**

DGAC
Direction des Services de la Navigation Aérienne

DASSAULT AVIATION
Direction Technique Certification

SESAR Project - AAL EFVS OPERATION WITH OPERATIONAL CREDIT

Impact on ATM-Aerodrome

Issue	*Date*	*Issue*	*Prepared by*	*Validated by*
Origin	*29-jan-16*	*1*	See control sheet	Ses control sheet
Last Issue	*29-jan-16*	*1*		

CONTROL SHEET

VISA TABLE of DGT153396

DASSAULT AVIATION			
Name	**Job Title**	**Date**	**Visa**
Prepared by:			
Olivier BAUDSON	System Engineering/ Engineer	29-jan-2016	
Mélanie AMBLARD	Certification Engineer	29-jan-2016	
Verified by:			
Alain BOUCHER	Head of navigation department & ATM expert	06-fev-2016	
Richard ESNON	Deputy Head of Design & Operational Suitability Safety & Operational Suitability Expert	06-fev-2016	
Philippe REBOURG	Flight Test Pilot	14-fev-2016	

DGAC/DSNA			
Name	**Job Title**	**Date**	**Visa**
Prepared by:			
René FEILLET	Head of strategic operations, DSNA/DO2	05-fev-2016	
Verified by:			
François GREMY	National Program Coordinator for IFP, DSNA	05-fev-2016	

Note: Signatures are recorded electronically. Validity of the document is evidenced by a red electronic stamp in the left hand margin on the first page.

TABLE OF CONTENTS

Sommaire

1. PRELIMINARIES

1.1 Table of issues

Issue	Date	Updating Purpose
1	29 feb 2015	First issue. DGAC/DSNA-DASSAULT AVIATION analysis based on French Civil Aviation Autorithy regulation to support aerodrome safety analysis document and first flight demo.

1.2 Reference documents

Document	Title
[1]	CHEA *(French aérodrome regulation)* – Arrêté du 28 août 2003 relatif aux conditions d'homologation et aux procédures d'exploitation des aérodromes. Annex 4,5,6,7.
[2]	IR Part ADR EU139-2014_Aerodrome
[3]	AMC part ADR_Annex to ED 2014-012-R
[4]	Eur Doc 013, European Guidance material on All Weather Operation at Aerodromes, sept 2012
[5]	ICAO Manual of All weather operation doc 9364 4th edition introducing EFVS operation with operational credits
[6]	PANS OPS
[7]	PANS ATM
[8]	ICAO ANNEX 6: Operation of Aircraft
[9]	ICAO ANNEX 14 Aerodromes
[10]	ICAO ANNEX 10 Vol 1: Aeronautical communication. Radio Nav Aids
[11]	ICAO ANNEX 3 Meteorological Service for International Air Navigation
[12]	Arrêté SSLIA (ministerial decree about rescue and fire fighting services)
[13]	Arrêté péril animalier (ministerial decree about Wildlife strike Hazard)
[14]	IR AIR OPS part SPA & CAT
[15]	Draft NPRM US june, 11, 2013
[16]	AC 20-167A Airworthiness Approval of Enhanced Vision System, Synthetic Vision System, Combined Vision System, and Enhanced Flight Vision System Equipment
[17]	AC 90-106A Enhanced Flight Vision Systems

1.3 Acronyms

A/C	AirCraft
ADSB	Automatic Dependant surveillance Broadcast
AFIS	Aerodrome Flight Information Service
AFM	Airplane Flight Manual
AIP	Aeronautical Information Publications
AIS	Aeronautical information service
ALS	Approach Lightning System
APV	Approach with Vertical Guidance
ATC	Air Traffic Controller
ATIS	Air Traffic Information system
ATS	Air Traffic Service
CHEA	French aerodrome regulation (Conditions d'Homologation et Procedures d'Exploitation des Aérodrome)
CAA	Civil Aviation Authority
CMV	Converted Meteorological Visibility
CPA	Close Point of Approach
DA	Dassault Aviation
DA/H	Decision altitude/ Height
DGAC	Direction Generale de l'Aviation Civile (French Civil Aviation Authority)
DSNA	Direction des Services de la Navigation Aérienne (DGAC directorate of navigation services)
EFVS	Enhanced Flight Vision System

EPIS CA	ATS/ aerodrome Safety Analysis (Etude Préliminaire d'Impact de Sécurité sur la Circulation Aérienne)
EVP	Enhanced Visibility Procedures
EVS	Enhanced Vision System
FAF	Final Approach Fix
FOV	Field of View
IR	Infra Red
LPV	Localizer Performance with Vertical guidance
LVP	Low Visibility Procedure
MAPT	Missed Approach PoinT
NDB	Non Directional Beacon
PAPI	Precision Approach Path Indicator
PPR	Prior Permission Required
RMT	Rulemaking task
RTF	Radiotelephone
RVR	Runway Visual Range
SESAR LSD AAL	SESAR Large Scale Demo Augmented Approach to Land
TSCH	Threshold
OCA/H	Obstacle Clear Altitude/ Height
OFZ	Obstacle Free Zone
SSLIA	Service de Sauvetage et de Lutte contre Incendie des aéronefs sur les Aérodromes (fire fighting and rescue service)
SMGCS	Surface Movement Guidance and Control System
TDZ	Touch Down Zone
VIBAL	Visibilité BALise (Human observer RVR assessment)
VSS	Visual Segment Surface

1.4 Purpose of the Document

This document provides impact analysis of EFVS operation with operational credit on ATM-Aerodromes, and proposes recommendations.

It was written jointly by DGAC/DSNA and DASSAULT AVIATION in the frame of SESAR LSD AAL WP3.

This document is intended to be used as an input to support EASA rulemaking task RMT0379 regarding All weather Operation, in defining the criteria necessary for ATM and Aerodrome to permit EFVS with operational credit operation.

It includes the impacts :

- On aerodrome installation and design of procedure,
- On aerodrome -ATM procedures, including ATS phraseology,
- On airborne/ aircrew procedures, including pilot phraseology,
- On aerodrome documentation/ broadcast.

In addition to the here above topics, this document:

- reminds the points that are checked along with aircraft certification process.
- proposes an aerodrome/ ATS safety analysis (EPIS CA) for each french aerodrome partner of the SESAR AAL WP3 project.

This document addresses aerodromes where air traffic service is provided by either an aerodrome control service or uncontrolled aerodrome with active AFIS organism in order to enable the establishment and the deployment/cancelation of procedures.

This document concerns aerodromes equipped with instrument runways, and with or without LVP.

This document covers the 3D approaches that are intended to support EFVS operation with operational credit:

- on ILS CAT I
- on RNAV with LPV minimum, and on RNAV with LNAV/VNAV minimum
- And possibly on HUD based CAT II operations, future “HUD based SA CAT I” operation and future HUD based SVGS operations.

The recommandations proposed in that document will be consolidated by real experimentations on aerodromes partners of the project in the frame of SESAR LSD AAL. Tests will be performed at:

- Bordeaux Mérignac - LFBD (CAT II/III airport with LVP),
- Bergerac - LFBE (CAT I airport without LVP)
- and Périgueux - LFBX (RNAV LPV without LVP. LFBX is an uncontrolled airport with AFIS service)

aerodromes and the document will be updated to take into consideration the results of the tests.

This document is mainly based on the review of the CHEA (french aerodrome regulation). A future issue will take into account the review of the Eur13 *"European Guidance Materia on All Weather Operations at aerodrome"* which the purpose is to assist EUR states in the development of procedures to be applied in Reduced Aerodrome Visibility Conditions (RAVC) and the implementation of Low Visibility Procedures (LVP) in a harmonised way.

2. INTRODUCTION

The PANS-ATM (14th edition, applicable 1 November 2001, Chapter 7, 7.12.1) have introduced the requirements for procedures in low visibility operations whenever conditions are such that all or part of the manoeuvring area cannot be visually monitored from the control tower. The term Reduced Aerodrome Visibility Conditions (RAVC) has been established to define these conditions, regardless of the category of aircraft flight operations (e.g., CAT I or CAT II) taking place at the aerodrome. This value depends on each aerodrome infrastructure (location and height of control tower, taxiway and runway layout…). The term LVP is dedicated to procedures established to support safe approach and landing operations (as well as departure) in RVR conditions below 550m (400m for take off). It consists in providing the accuracy and integrity of ground based navigation means necessary for the operation.

As a guideline, the general objectives of procedures for low visibility operations are to:

- protect active runways against incursions by aircraft, vehicular and pedestrian traffic;
- facilitate the availability of various support equipment and facilities (including for example, RVR equipment and aerodrome lighting) to prescribed levels of availability and redundancy, to support those flight operations which require procedures to be in force;

- preserve the accuracy and the integrity of radio navigation aids, for example via protection of ILS Critical and Sensitive Areas;
- support the efficient flow of aircraft, mainly between terminal buildings and runways, but also between other areas, such as aprons and maintenance facilities;
- reduce the possibility of conflicts between the aircraft, vehicular, animals and pedestrian traffic;
- assist ATS and/or Apron Management staff to maintain situational awareness of the positions of traffic on the manoeuvring area and aprons depending on complexity of aerodrome layout and aircrafts using the aerodrome;
- facilitate coordinated action by various agencies, including the aerodrome and aircraft operators, rescue and fire fighting services (SSLIA in French), vehicle operators and drivers, MET and AIS providers, and ATS;
- ensure that accurate and timely information is available to pilots regarding the status of relevant supporting systems, including equipment, facilities, meteorological conditions and the LVP themselves.

Regarding EFVS operation with operational credit, the present document contains impact analysis and recommendations that are proposed for operations utilizing EFVS systems during approach, landing, rollout and taxi in low visibility conditions down to 300m RVR. Moreover, in the frame of SESAR test campaign, and as a safety assessment is required in respect of significant changes in the provision of ATS procedures applicable to airspace or an aerodrome by Global ICAO provisions for introduction of new systems, a safety analysis (EPIS CA) is carried out by each aerodrome partner of the project. This EPIS CA is consistent with aerodrome recommendation defined.

3. EFVS OPERATION WITH OPERATIONAL CREDIT

3.1 Conditions of operation:

The EFVS operation with operational credit is intended to be performed in RVR as low as 300m (1000ft).
The expected performance of the EFVS system at the time of the landing is estimated during preparation of the flight by the crew depending on weather forecast & environmental conditions.

3.2 Element of concept of operations

EFVS with operational credit operation is a HUD & EVS image based approach.
It consists in pursuing a 3D instrument approach below published minima by using both approach related information in HUD and EVS image displayed in HUD (EFVS).

Per EFVS operation with operational credit basic concept, the crew can descent below published DA/DH down to touchdown, and execute the rollout provided that:

- visual references (enhanced or natural) required for the approach can be maintained through the HUD in EFVS
- these EFVS visual references are consistent with other independent flight information such as like the approach guidance, the synthetic runway or the approach reference path.

As part of the concept, both pilots share a common view with the same level of information at any time of the approach (for example dual HUD operation for the DASSAULT concept of operation).

Pilots who will operate EFVS with operational credits will receive suitable training.

3.3 EFVS Approach types and restrictions

The EFVS operation with operational credit is intended on approaches with published vertical guidance (3D approaches), which means:

- On ILS CAT1,
- On RNAV with LPV published minimum,
- On RNAV with LNAV/VNAV published minimum.

In addition, these approaches must satisfy the following criteria:

- The Offset between the final approach axis and the runway axis is no more than 2°,
- The vertical path of the approach, from FAF to aiming point is no more than 3.77° (study and demonstrations will be carried out for steeper approaches)

3.4 Traffic capacity/ continuity of service

EFVS operation with operational credit is intended to be possible on aerodrome with or without LVP.

When EFVS operation with operational credit is performed on aerodrome where LVP are published (to support CAT II or III operations), those LVP procedures apply and must be active. They enable to guaranty the level of continuity of service and the capacity of the traffic. This concerns large, high density aerodromes with CAT II/III capabilities that are the only access points when visibility falls below 550m RVR. As go around on that kind of aerodrome -whatever the reason- may significantly affect the capacity of traffic, redundancies and high level of equipment are required per aerodrome regulation to maintain a regularity of service.

When EFVS operation with operational credit is performed on aerodromes without LVP, specific procedures, proposed here to be called as EVP (Enhanced Visibility Procedure) are recommended to guaranty safety of the operation (purpose of that document). This concerns small/ regional aerodromes with LOW or MEDIUM traffic density and with published minima that are equal or above DH200ft/ RVR550m (CAT1 operation).
The necessity for EVP for EFVS operation with operational credit require controlled aerodrome or uncontrolled aerodrome with active AFIS organism.

Regarding EFVS operations with operational credit, the traffic density is expected to be LOW most of the time at these small/ medium aerodromes when weather conditions fall below published minima (see ANNEXE B for reminder of definition for traffic density).

4. IMPACTS ON REGULATION AND RECOMMANDATIONS

4.1 General

4.1.1 Regulation basis

The analysis of the EFVS operations with operational credit impacts on aerodrome procedures and installations is primarily based on the review of the requirements contained in the seven annexes of CHEA (French aerodrome homologation regulation).

CHEA was preferred on European regulations because of three major points:

- it is considered by DGAC as a proven regulation since all French aerodromes (including HUB) are operated with,
- it is a comprehensive regulation, as it also considers aerodromes with AFIS organism,
- the transition from French regulation (CHEA) to the European regulation is still in progress in France, and some points remain under discussions with EASA.

In a future release of the document, it is intended to review it against European regulation basis such as IR ADR, IR AIR OPERATIONS part CAT/part SPA regulation, and Eur13 and possibly AWO aerodrome standards.

The analysis of the detailed requirements of the CHEA that was done during joined Workshops between DSNA and DASSAULT AVIATION is available on request (in French).

4.1.2 Method/ Team

Each requirement of the regulation basis is discussed by a group of experts (see below), and possible need for either procedure or installation is proposed, reported and substantiated in the present document.

The team of expert is composed of:

- DGAC operational and technical experts in ATC domain, in approach domain, in aerodrome homologation domain, in aerodrome regulation domain, and in operator operational approval domains for “EFVS with operational credit”,
- DSAC representative for France in RMT0379 for European regulation consistency,

- French aerodrome's partner personnel including aerodrome director, AFIS and controller managers, aerodrome operator, station manager, air operation director, rescue and fire fighting service manager,

- DASSAULT AVIATION EFVS technical, operational, certification and flight tests experts

4.2 Aerodrome-ATM impacts: Detailed EVP

First of all, and from a general standpoint:

- LVP (Low Visibility Procedure), when published (for CAT II/III aerodromes) apply for EFVS operation with operational credit in conditions as low as 300m (1000ft) RVR.

- For aerodromes where no LVP exist (other than CAT II/III aerodromes), EVP (Enhanced Visibility Procedure) must be considered.

The following sections describe the aerodrome-ATM recommendations proposed to be considered for EFVS operation with operational credit.

For each recommendation proposed:

- The rationale for the recommendation is detailed,

- The regulation reference (when identified) is mentioned,

- An aerodrome effort indicator is provided (and substantiated),

- An expended substantiation is given below the table for recommendations numbers ended by a star (*).

4.3 Aerodrome Installations

This section describes the installations needed to support safe and efficient EFVS operation with operational credit on ground and in flight.

A star (*) at the end of the rule number indicates an additional substantiation is provided below the table.

INST.X	Rationale for EFVS operation with operational credit/ impact	Regulation reference	Aerodrome effort indicator	Mandatory/ Recommended
INST.1a* automated RVR For aerodromes where traffic density is demonstrated to be MEDIUM[1] or higher during EVP period, an automated measurement of RVR representative of TDZ must be available for QFU capable of EFVS with operational credit. When RVR becomes invalid (>1500m-2000m), a prevailing visibility with possible direction is communicated by ATS to the pilot.	Enable the crew to make decision to continue the approach beyond approach ban considering EFVS sensor performance	AC 20 167 ICAO ANNEX3 4.2.4	MEDIUM In case aerodrome is not already equipped with RVR sensor	Mandatory
INST.1b* human observer RVR For aerodromes where traffic is demonstrated to be LOW[2] during EVP period, RVR representative of TDZ may be obtained per a properly qualified/ trained human observer using an approved procedure. In case RVR is too high to be determined by a human observer (greater than 900m for ex), a prevailing visibility with possible direction is communicated by ATS to the crew	Enable the crew to make decision to continue the approach beyond approach ban considering EFVS sensor performance	Doc ICAO 9328 CHEA VI.7.12.4 ICAO ANNEX3 4.2.4	LOW	Mandatory

[1] Numbers according to ICAO ANNEX 14 Volume I §1.1, see ANNEXE B for reminder.

INST.2 RVR Delay The RVR (automated or human observer) must be communicated at least one time before the approach ban and may be updated in case of significant changes. The RVR must be not older than 5 minutes (TBC during demos).	Enable the crew to be informed of the RVR and possible changes before reaching latest approach ban (1000ft HAT). Enable the crew to make decision to continue the approach beyond approach ban.	AC 20 167 ICAO ANNEX 3 ATT-C	LOW	Mandatory
INST.4 Caution Lighting Where identified as necessary by safety analysis, special features such as flashing light will be added on some critical taxiway/ runway/ specific area/ service road crossing used by vehicles and persons.	To ensures that vehicles and persons are informed that EVP are in force	CHEA VI.4.2 CHEA VI.4.3	MEDIUM	recommended
INST.5 Fences Fence / barrier must be provided on the aerodrome for the areas vital to the safe operation of aircraft.	To prevent the inadvertent or premeditated entrance in the movement area of vehicles, persons, or animals large enough to be a hazard to aircraft	CHEAVI.7.9 ICAO A14 §9.10	MEDIUM	Mandatory
INST.6 Lighting Serviceability When EVP are active, a minimum of 85% of the lighting must be operative for each of the following part, when available: • Approach Lighting system (ALS) • Runway threshold lights • Runway center line line • Runway edges lights • Runway end lights	To guaranty the lighting system is usable by the crew and not misleading. (TBC demo)	CHEA V.8 ICAO ANNEX 14 §10.5	LOW	Mandatory

Two adjacent lights must not be unserviceable				
INST.7* Switch over time (lights) The secondary power supply switch over time must be no more than 1 second for runway lights.	To enable a safe rollout in case of failure of the runway lighting system.	ICAO A14 §8.1.7	LOW	Mandatory

INST.1a* RVR sensor

RVR measurement need:

Per IR AIR OPS and AC 90-106A, 300m/1000ft RVR is considered as a sufficient visibility enabling the crew to manually land an aircraft (*see here below IR AIR OPS GM1 SPA.LVO.100(c),(e) Low visibility operations* ❶). Regarding EFVS operation with operational credit, and especially the case where EFVS image is lost, this real visibility enables the crew to check that aircraft is well aligned with the runway before landing, and then to ensures that a safe landing and rollout can be still performed.

Therefore, an RVR measurement is necessary for EFVS operation with operational credit.

Number of RVR measurement and characteristics:

According to IR AIR OPS (from air operation standpoint), only one RVR assessment is requested for CATII operation. Loss of Mid or rollout RVR have no effect on the operation, provided TDZ RVR remains available (*See here below the Extract from IR AIR OPS AMC7 SPA.LVO.100 Low visibility operations* ❷*).*

Therefore, the second RVR sensor which is requested by aerodrome regulation for CATII operations for redundance and continuity of service purpose cannot be mandatory for EFVS operation with operational credit on small/ medium aerodrome for which assumption of traffic during EVP period is LOW.

❶ *Extract from IR AIR OPS GM1 SPA.LVO.100(c),(e) Low visibility operations*

(b) CAT II operations

The selection of the dimensions of the required visual segments that are used for CAT II operations is based on the following visual provisions:

(1) a visual segment of not less than 90 m will need to be in view at and below DH for pilot to be able to monitor an automatic system;

(2) a visual segment of not less than 120 m will need to be in view for a pilot to be able to maintain the roll attitude manually at and below DH; and

(3) for a manual landing using only external visual cues, a visual segment of 225 m will be required at the height at which flare initiation starts in order to provide the pilot with sight of a point of low relative movement on the ground.

Before using a CAT II ILS for landing, the quality of the localiser between 50 ft and touchdown should be verified.

❷ *Extract from IR AIR OPS AMC7 SPA.LVO.100 Low visibility operations*

Table 7: Failed or downgraded equipment – affect on landing minima

Operations with an LVO approval

Failed or downgraded equipment	Effect on landing minima			
	CAT IIIB (no DH)	CAT IIIB	CAT IIIA	CAT II
ILS/MLS stand-by transmitter	Not allowed	RVR 200 m	No effect	
Outer marker	No effect if replaced by height check at 1 000 ft			
Middle marker	No effect			
RVR assessment systems	At least one RVR value to be available on the aerodrome	On runways equipped with two or more RVR assessment units, one may be inoperative		

RVR validity domain and prevailing visibility:
In case RVR is not available (because RVR sensor range of measure are limited to 1500-2000m or because human observer information assessment is difficult to be performed beyond 900m, for geometrical considerations), the prevailing visibility is communicated to the pilot as a "visibility".
As it is for other operations, it is at the end, the crew responsibility to convert the prevailing visibility into RVR by using RVR/CMV convertion table defined in IR OPS (AMC10 CAT.OP.MPA.110) according to aerodrome features (lighting system category and day or night information).

Per ICAO ANNEX3, the visibility (also called as prevailing visibility) is the greatest visibility value, which is reached within at least half the horizon circle (or within at least half of the surface of the aerodrome).

- In case the lowest visibility on the horizon circle is less than 5 000 m:
  - either less than 1 500 m
  - or less than 50 per cent of the prevailing visibility;

  then, the lowest visibility observed is reported in direction indicated by reference to one of the eight points of the compass
- If the lowest visibility is observed in more than one direction, then the most operationally significant direction should be reported;

When the visibility is fluctuating rapidly, and the prevailing visibility cannot be determined, only the lowest visibility should be reported, with no indication of direction.

INST.1b* RVR human observer system
In accordance with ICAO Doc 9328 *"Manual of Runway Visual Range Observing and Reporting Practices chapter 10"*, and as permitted by CHEA ANNEX A VI.7.12.4, where traffic is LOW and where RVR sensor is not installed, human observer RVR may be considered.
Human observer RVR assessment is based on visual observation of lights or special markers.
Human observers will be capable to deliver an RVR assessed at the beginning of the approach. Any significant changes ("abrupt changes") of human observer RVR will be based on ATS observation and qualitative information will be communicated only.

Note 1 about weather/ MET forecast:
For normal operation, pilot checks the MET forecast at destination by using METAR/ TAF related to DEST, or if not available by looking at surrounding aerodromes. EFVS operation with operational credit does not change anything to the normal way to proceed regarding weather forecast. The absence of TAF/METAR on the DEST aerodrome does not prevent to select it as the DEST. TAF/METAR service is not formally requested for EFVS operation with operational credit.

Note 2 about cloud base/ ceiling:
The information of cloud base is the height of the lowest layer of clouds covering more than half of the sky (see ICAO ANNEX 3 §4.5). Moreover, per DSNA ATS experience, it remains a *"general information"* considering it results from ceilometers measurements (or human assessment) located on various locations of the aerodromes that are not always representative of the EFVS with operational credit approach segment between DA/H and runway. Moreover, cloud height information is not part of decision criteria for basic operations, as it is for RVR.
Therefore, per principle, this information is usually not reliable enough to be taken into account in the sensor performance computation. As it is for the other operations, it is not formally requested

for EFVS operation with operational credit, and is proposed be used as a general information, when available.

INST.7*

The delay of 1 sec is consistent with the one required for take off in visibility less than 800m and ensures the continuity of the operation in case of failure on ground. (see ICAO ANNEX 14 §8.1.7). Considering that EFVS operation with operational credit is proposed to be performed with or without center line light, a delay of 1 second is proposed at least for runway edge lines, and for runway centre line lights when available.

Because of secondary power supply may take long to be switched to ON compared to normal one, a possible way to comply with the 1 second requirement is to use the secondary power supply as the primary mean in EVP, and to switch on the normal power supply in case of failure. Such a procedure is applied in Bergerac.

4.4 Approach design procedure

This section describes the approach design procedure criteria to be satisfied to support safe and efficient EFVS operation with operational credit in flight.

A star (*) at the end of the rule number indicates an additional substantiation is provided below the table.

DES.PROC.X	Rationale for EFVS operation with operational credit/ impact	Regulation reference	Aerodrome effort indicator	Mandatory/ Recommended
DES.PROC.0* obstacles clearance in approach VSS of approaches intended for EFVS with operational credit must be clear of obstacle	Provide protection regarding obstacle during continuation on EFVS segment	CHEA.VII.2.7	LOW *note 3*	Mandatory
DES.PROC.1* obstacles clearance on missed approach An IFR departure procedure must be published for the EFVS with operational credit related QFU, unless a specific study allows a safe go around on the runway. The climb gradient required up to the 1st turn of the missed approach must be such that the altitude required by the omnidirectional departure procedure is reached at 1st turn of missed approach position.	Provide appropriate protection regarding obstacles in case of go around below and beyond DA/DH, possibly on the runway.	DGAC /DA analysis	LOW/MED	Mandatory

DES.PROC.0* Obstacle clearance in approach:

During EFVS operation with operational credit, A/C is authorized to continue below DA/DH provided pilots see required visual cues through EFVS image and provided flight information is consistent with EFVS image (see §3). As it cannot be assumed that obstacle can be for sure detected and avoided by using EFVS image, it is important that sufficient obstacle clearance is guaranteed by some criteria associated to the design of the procedure.

On precision runway CATII/III, obstacle clearance is ensured via OFZ.
On precision runway CAT I[2], OFZ are only recommended and penetration of these surfaces (approach or missed approach) is permitted provided a specific analysis, which may lead to adjust minima, is performed. In any case, the obstacles penetrating surfaces are published in AIC.

More generally, from 2012, a Visual Segment Surface (VSS) is defined between OCA/H and runway for any straight-in instrument approach procedure[3] with FAF. The objective is to protect aircraft from ground obstacles[4] in visual part of the instrument approach. VSS is monitored (periodically, or in case of new design of procedure) by aerodrome operator to prevent the approach from becoming unusable due to uncontrollable growth of obstacles, or from man-made development such as building, mast or other structure (see note 3 here below).

- Vertically, the VSS, which originates at 60m from runway threshold and has a slope of 1.12° less than the promulgated approach procedure angle,
- Laterally, the VSS has for straight in approaches the same width as the Annex 14 inner approach width (i.e 150m).

Whatever the approach type with FAF, in case VSS is penetrated, the respective approach procedure should not be promulgated without conducting an aeronautical study. As a consequence, the study may result in mitigating actions to achieve an acceptable level of safety in operations such as listed in Doc 8168, Volume II, Part I, Section 4, Chapter 5, paragraph 5.4.6.4. For example, approach angle may be increased, or threshold may be displaced, or approach can be prohibited.
On French AIP AD2 chart (for ex Perigueux LFBX RW29) obstacle penetrating the VSS are depicted in red. However, in case of several published minima are defined on the same chart of AIP (as it is for LFBX for RNAV based approaches), all the obstacles are depicted on the same chart without any indication regarding the approach that is really impacted. This means that ILS or LPV may be not affected by obstacle depicted on the chart. This is the reason why pilot would not be capable to determine if the approach flown during EFVS with operational credit is clear of obstacle. At LFBX, for example, none of the depicted red obstacle concern ILS or LPV approach and high minima result from terrain/obstacle on the missed approach, not from terrain/obstacle on approach path.

Recommendation for EFVS operation with operational credit:

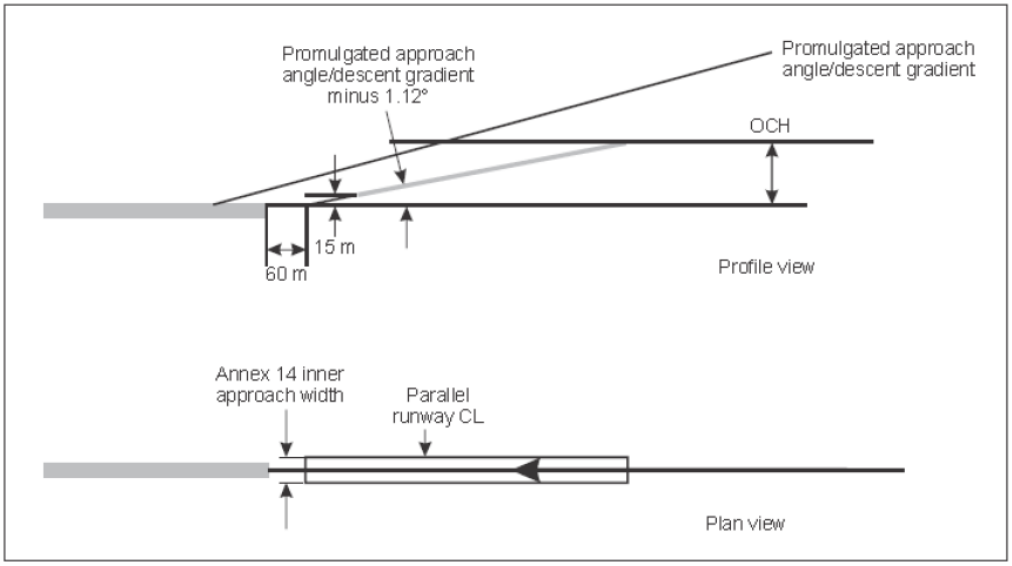
[2] Approaches where ALS (Approach Lighting System) or PAPI are installed offer obstacle protections (see ICAO Annex 14).

[3] Non straight in-approaches (circling minimum), which are not authorized for EFVS operation with operational gains have no VSS.

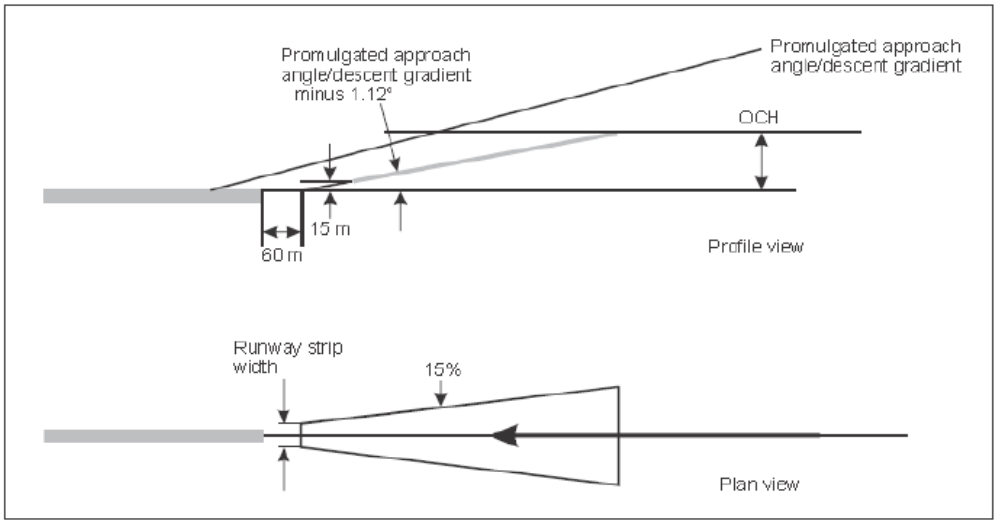
[4] Only obstacle higher than a plane located at 15m HAT are considered as hazard regarding the VSS penetration.

To get EFVS with operational credit aerodrome approval on specific instrument approach, aerodrome should check that the VSS is clear of obstacle for this specific approach. If not, approach cannot be approved for EFVS with operational credit, unless a specific study is conducted by the aerodrome, taking into account aircraft performances.

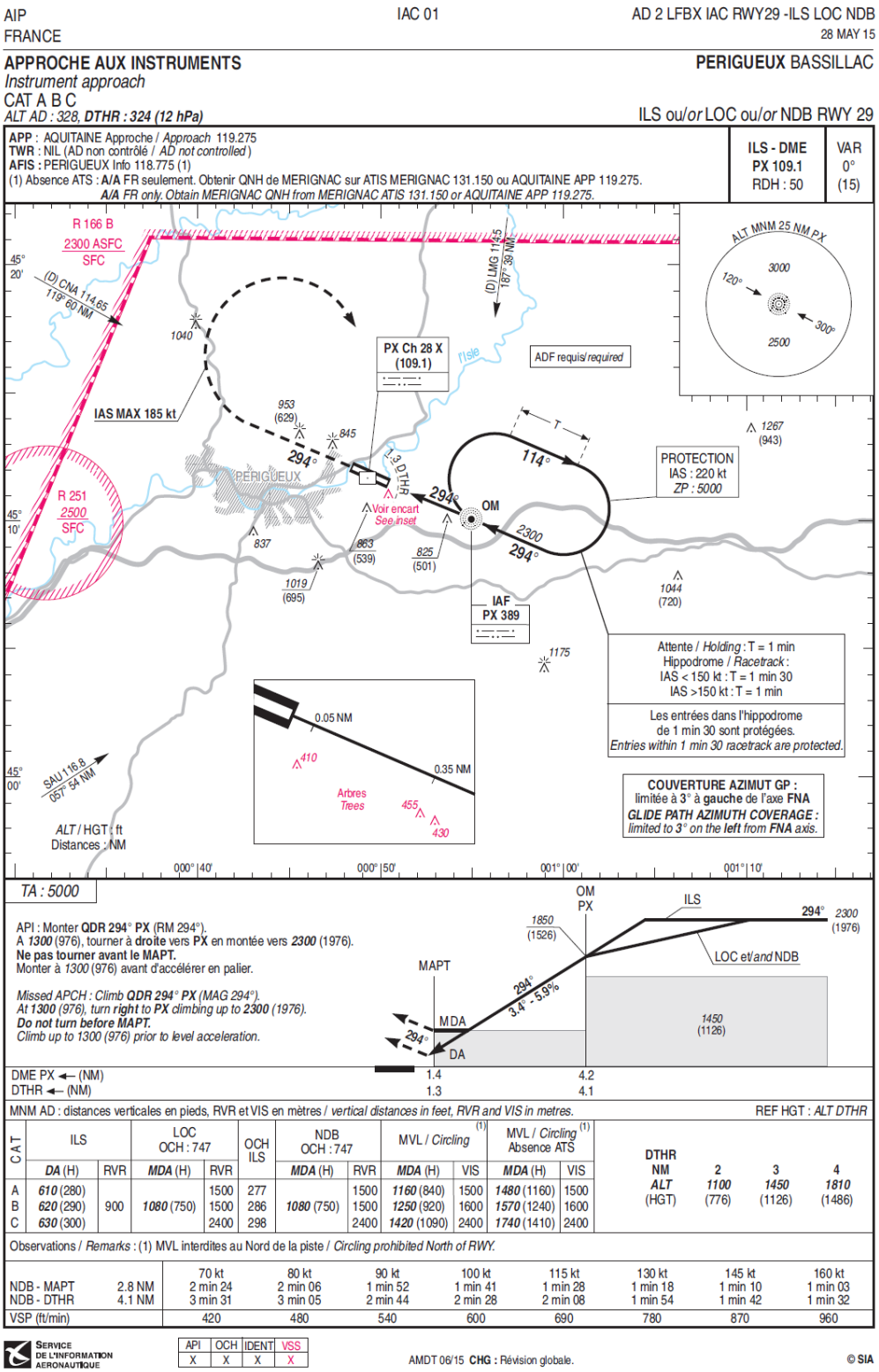
Note 3:
The VSS was originated by ICAO working panel and is defined in PANS-OPS Doc 8168 Vol II, Part I, Section 4, Chapter 5, paragraph 5.4.6.4. From 15 March 2012, VSS is assessed for all straight-in instrument approach published.



VSS geometry for ILS/LPV approach



VSS geometry for non ILS/ LPV approach



Example of IAC (French) with depiction of obstacle exceeding VSS surface of NDB approach only

DES.PROC.1* obstacle clearance in missed approach

Per design, the published missed approach procedure considers a go around maneuver no later than DA/DH (including a height loss for go around maneuver) and assumes a missed approach slope of 2.5% (with one engine out) to clear obstacle.

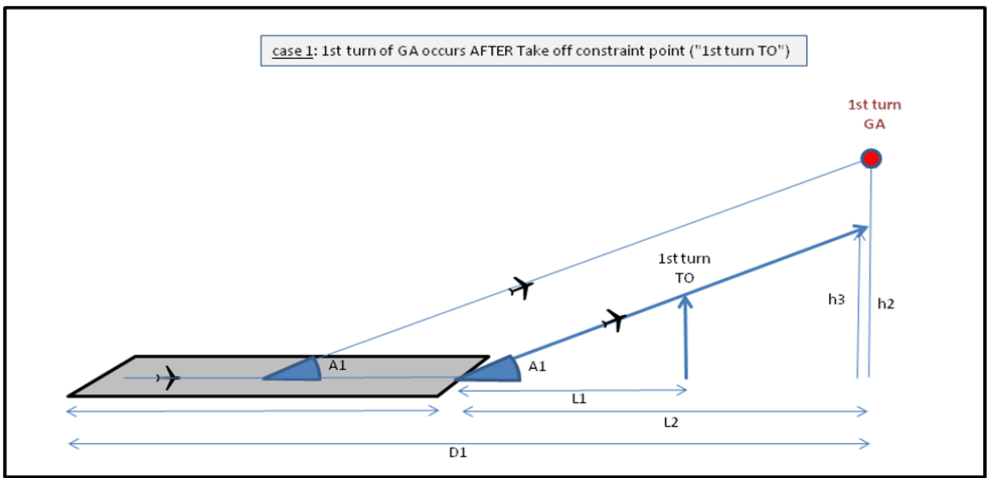
Although missed approach is still possible below DA/DH (and beyond MAPT when exists) during normal operation due to unexpected event (loss of visual reference, gust, obstruction on runway, crew incapacitation…), such an operation must be considered by operator/ crew, and appropriate procedure must be defined regarding each aerodrome/ aircraft configuration and performance.

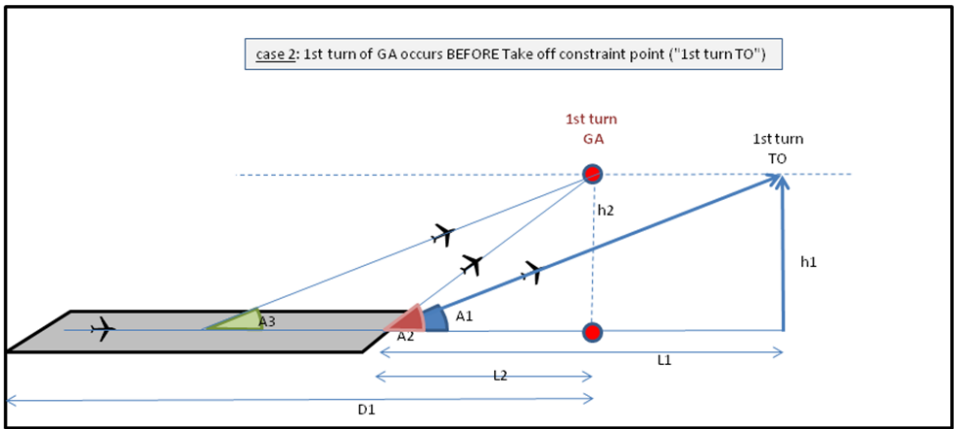
This is especially the case on some constrained aerodromes, where missed approach procedure below DA/H may be challenging because normal missed approach path starts by an immediate turn after the MAPT located well prior to runway threshold (ex LFMD RW35, Cannes). On these QFU, there is no departure procedure.

In absence of specific study demonstrating that a safe missed approach starting on the runway (balked landing) can be performed, it is proposed to authorize the EFVS with operational credit approaches operations only on QFU for which an IFR departure is published.

Moreover, in order to ensure that the trajectory flown by the aircraft during missed approach is safe regarding obstacle, it is proposed to comply with the altitude/ slope gradient constraints requested for departure trajectory procedure (which may be different from published missed approach). This means that the missed approach vertical constraints (the aircraft FMS related guidance follows the published missed approach trajectory when in GO AROUND) requested for EFVS operation with operational credit must be such that the first turn of this segment satisfy omnidirectional departure constraints (altitude at a defined position). Two cases are possible:

- The first turn of the missed approach occurs AFTER the omnidirectional departure constraint point (see illustration case1 here below).
  - ➡ The climb gradient requested for omnidirectional departure will ensure aircraft will be above these constraints at the first turn of the missed approach,
- The first turn of the missed approach occurs BEFORE omnidirectional departure constraint point (see illustration case2 here below):
  - ➡ A climb gradient higher than those requested for omnidirectional departure must be determined





Examples:
During an EFVS operation with operational credit approach in GNSS29 in LFBX for which 1st turn of the GO AROUND occurs AFTER departure constraint point (L2 = 2.5NM versus L1 = 1.1NM on the top picture here above), the departure climb gradient (9.6% = A1) will enable to comply with appropriate obstacle clearances.

During an EFVS operation with operational credit approach in GNSS28 in LFBE for which 1st turn of the GO AROUND occurs BEFORE departure constraint point (L2 = 2.3NM versus L1 = 3.4NM), the departure climb gradient requested of 3.7% (A1) is not steep enough to comply with departure altitude constraints. In that case, the aircraft must be capable of a steeper climb gradient of 5.4% (A2), assuming the go around maneuver is initiated at the end of the runway (or 4.3% -A3- assuming a go around maneuver is initiated later at the middle of the runway).

Observation: Pilot should be alerted of the presence of obstacle on missed approach segment by the fact the OCH is greater than the minimum one for the approach considered (for example 200ft for ILS CAT1 or 250ft for LPV on non precision QFU).

AIP
FRANCE

AD 2 LFBX ADC 01
28 MAY 15

CARTE D'AERODROME
Aerodrome chart
ALT AD : 328 (12 hPa)

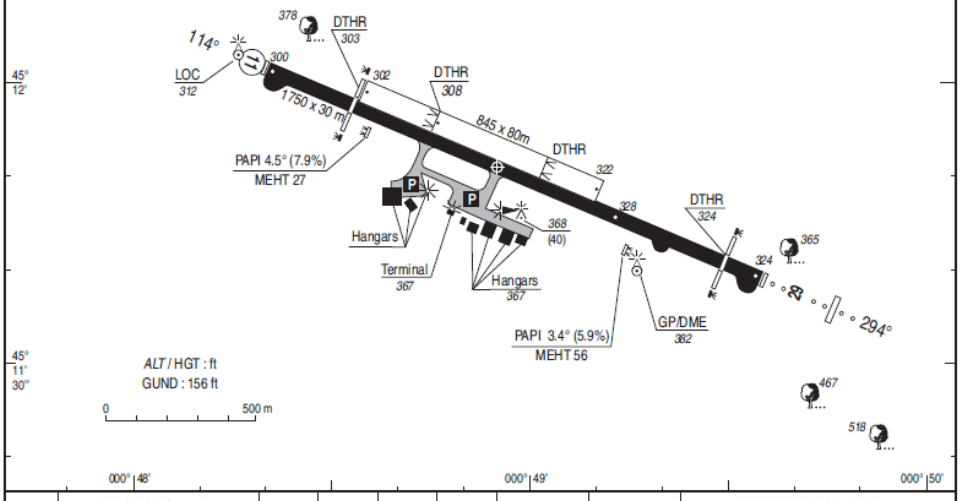
Ouvert à la CAP
Public air traffic

PERIGUEUX BASSILAC
45 11 51 N - 000 48 55 E

ATS : AFIS : LUN-VEN / *MON-FRI* : 0500-1100, 1300-1800, 2000-2130. ETE / *SUM* : - 1 HR.
En dehors de ces HOR / *Outside these SKED* : PPR PN 48 HR.
☎ 05 53 02 79 75 - FAX 05 53 02 79 78
Pour vols commerciaux officiels et sanitaires : ☎ (astreinte permanente) 06 08 82 98 68
For official commercial and medical flights : ☎ *(permanent on call) 06 08 82 98 68*
BRIA : BORDEAUX (Voir / *see* GEN 3.1).
AVT : automate AIR TOTAL (AVGAS 100LL uniquement) : H24 - JET A1 : HOR AFIS, carte VISA, chèque, espèces.
AIR TOTAL automatic dispenser (AVGAS 100LL only) : H24 - JET A1 : AFIS SKED, VISA credit card, cheque, cash payment.
Péril animalier / *Wildlife strike hazard* : Occasionnel / *Random.*

VAR
0°
(15)

TYPE	LATITUDE	LONGITUDE
THR 29	45° 11' 38.75" N	000° 49' 34.27" E
DTHR 29	45° 11' 40.45"N	000° 49' 28.75" E
THR 11	45° 12' 01.48" N	000° 48' 20.77" E
DTHR 11	45° 11' 57.60" N	000° 48' 33.33" E



RWY	BALISAGE / *Lighting* APCH	BALISAGE / *Lighting* RWY	TORA	TODA	ASDA	LDA	NATURE *Surface*	RESIST. *Strength*	MINIMUM TKOF (RVR : m) CAT A	CAT B	CAT C	CAT D
11	NIL	LIH/LIL	1750	1750	1750	1450	Revêtue *Paved*	31 F/C/W/T	250*	250*	250*	-
29	420 m	LIH/LIL	1560 (1)	1750	1560 (1)	1430 (1)			250*	250*	250*	-
			(1) voir observations / *see remarks*						* Absence ATS : 550 m .			

CONSIGNES RECOMMANDEES POUR UN DEPART IFR / *Recommended instructions for IFR departures*

RWY 11 : Monter RM 114° jusqu'à *1050* (722) à 11% (2) puis route directe en montée jusqu'à l'altitude de sécurité en route.
RWY 29 : Monter RM 294° jusqu'à *1050* (722) à 9.6% (3) puis route directe en montée jusqu'à l'altitude de sécurité en route.
RWY 11 : Climb MAG 114° up to 1050 (722) at 11% (2) then direct route climbing to en-route safety altitude.
RWY 29 : Climb MAG 294° up to 1050 (722) at 9.6% (3) then direct route climbing to en-route safety altitude.

BALISAGE / *Lighting* :
RWY 11/29 : DTHR - Extrémités : HI/BI
RWY 11/29 : DTHR - RWY ends : LIH/LIL

OBSERVATIONS / *Remarks* :
Résistance TWY et PRKG / *TWY and PRKG strength* : 26 F/C/W/T.
(1) Distances déclarées utilisables : TORA, ASDA, LDA RWY 29 réduites cause présence d'un shelter à 110 m de la DER.
Usable declared distances : TORA, ASDA, LDA RWY 29 reduced due to the presence of a shelter 110 m from DER.
(2) Obstacles constitués par des arbres / *Obstacles made up of trees* :
- ALT 365 ft à 34 m de la DER et 122 m de l'axe / *ALT 365 ft, 34 m from DER and 122 m from RWY axis,*
- ALT 467 ft à 284 m de la DER et 204 m de l'axe / *ALT 467 ft, 284 m from DER and 204 m from RWY axis,*
- ALT 518 ft à 520 m de la DER et 272 m de l'axe / *ALT 518 ft, 520 m from DER and 272 m from RWY axis.*

Ces obstacles déterminent des pentes de montée respectives de 23%, 14,4% et 12,4%.
These obstacles imply respectively 23%, 14.4% and 12.4% climb slopes.
(3) Obstacles constitués par des arbres : ALT 378 ft à 170,6 m en amont de la DER et 139 m de l'axe, déterminant une pente de montée de 13,6% / *Obstacles made up of trees : ALT 378 ft, 170,6 m upstream DER and 139 m from RWY axis, implying a 13.6% climb slope.*

SERVICE DE L'INFORMATION AERONAUTIQUE

AMDT 06/15 **CHG :** VAR, HOR, AVT, MNM TKOF absence ATS, consignes DEP, observations.

© SIA

IFR departure with specific climb slope requirement for LFBX

4.5 Common recommendations for all types of approaches

This section describes the ATS procedure and phraseology to support safe and efficient EFVS operation on ground, and in flight with operational credit.
The procedures described in this section are applicable to all EFVS operation with operational credit, whatever the approach type or aerodrome air traffic service type.

A star (*) at the end of the rule number indicates an additional substantiation is provided below the table.

The next two sections 4.6 and 4.7 add specific criteria for use on ILS navigation means and/ or aerodromes with an AFIS organism.

EVP.GEN.X	Rationale for EFVS operation with operational credit/ impact	Regulation reference	Aerodrome effort indicator	Mandatory/ wishable
EVP.GEN.0 LVP/EVP EFVS operations with operational credit are possible only on aerodromes where EVP or LVP are defined.	To guaranty the safety of the operation	CHEA VI.7.1	Max MED	Mandatory
EVP.GEN.1 LVP LVP, when published, must be considered during EFVS operation with operational credit operation	Ensure safe EFVS operation with operational credit	CHEA.VII.2.5	LOW Due to low traffic	Mandatory
EVP.GEN.3a limitation of movements On small/medium aerodromes without LVP, no other aircraft movement than aircraft performing EFVS operation with operational credit between the beginning of final approach and the parking is allowed	Enable ATS to manage traffic on ground in low visibility / reduce collision risk on ground. Prevent penetration of aircraft in OFZ.	CHEA.VII.2.5 CHEA VI.5.1.2 CHEA VI.5.2.1 CHEA VI.5.3.5 CHEA VI.5.3.6 CHEA VI.7.3	LOW Due to low traffic	Mandatory
EVP.GEN.3b* limitation of movements On CAT1 aerodromes (without LVP) with HIGH traffic density (ex Le BOURGET LFPB), traffic density criteria must be defined locally to ensure ground traffic is manageable by ATS.	Enable ATS to have a good awareness and to manage traffic on ground in low visibility / reduce collision risk on ground. Prevent penetration of aircraft on ground in OFZ.	CHEA.VII.2.5 CHEA VI.4.2 CHEA VI.4.3 CHEA VI.5.1.2 CHEA VI.7.8.2	MEDIUM	Mandatory
EVP.GEN.4* ground speed limitation Ground speed must be limited to 10kt during taxi	Provide sufficient time to enable the crew to detect and avoid collision with other possible traffic like aircraft or vehicles during taxi in RVR as low as 300m/ Compensate for the loss of visual traffic surveillance due to limited visibility	NASA expe Other Low vis procedure	LOW	Recommended

EVP.GEN.7* Restriction of circulation Circulation of vehicles and persons (except specific authorizations) on maneuvering areas is not allowed during EVP activation period	Prevent the risk of collision with some aircraft or other vehicles, and possible perturbation of navigation means (ILS), and possible interference with safety areas.	CHEA.VI.4.3 CHEA VI.5.1.2 CHEA VI.5.3.5.1	LOW. Even small aerodromes are equipped with RTF (or equivalent means)	Mandatory
EVP.GEN.5* RVR refresh *The ATS must inform the crew of RVR beforeapproach ban, and possibly communicate significant changes (especially down to 1000ft HAT).*	*Enable the crew to decide if the approach can be continued and if a safe landing/ rollout can be envisaged (including in case of abnormal EVS situation)*	*AC 120-27* *CAT.OP.MPA.305*	*LOW*	*Not specific EVFS, just reminded here*

EVP.GEN.8* EVP activation/ cancelation When RVR is below a defined RVR threshold (see note 6 here below), the EVP are activated at the first contact of the traffic performing EFVS operation with operational credit with ATS of DEST aerodrome (e.i 10-15 min before landing, usually when requesting for weather information). The EVP, when activated can be canceled when the traffic performing EFVS operation with operational credit has left the frequency of the DEST aerodrome on which it operated (on parking or after diversion to another aerodrome). Note 6: The RVR threshold The RVR threshold mentioned here above and required to activate EVP is defined locally depending on the usual weather changes and the complexity of the aerodrome. The threshold for initiating EVP activation cannot be lower than 550m.	To guaranty EVP will be in force when traffic performing EFVS operation with operational credit will start the final approach	CHEA VI.7.2	LOW	Mandatory

EVP.GEN.9 Lighting When EVP are active, all the lighting systems/ sign available (including INST4 lighting, if exist) must be switched ON/ illuminated, except on taxiways/ runways/ ALS that are not intended to be used for the EFVS operation with operational credit.	To maximize the enhanced visibility provided by the EFVS sensor without impairing pilot's vision	CHEA VI.7.3 CHEA V.7.5	LOW	Mandatory
EVP.GEN.10* Rescue and Firefighting When EVP are active, rescue and firefighting (SSLIA) service must be placed at least in "STANDBY DUTY". Persons and vehicles are prepositioned on dedicated area located so that they can promptly access to the runway TDZ intended for EFVS operation with operational credit	Enable to maximize safety. Enable the qualified/ trained human observer to make an RVR assessment, if necessary.	CHEA VI.7.3	LOW	Mandatory
EVP.GEN.11 EVP Phraseology Crew is informed that the EVP are active by ATS before starting final approach. The following ATS phraseology is proposed: **"EVP in FORCE"**	Enable to inform the crew that EVP are in force As there cannot be "EVP" and "LVP" on the same aerodrome, theses two phraseologies "EEEvvvppp" and "LLLvvvppp" cannot lead to pilot's confusion.	CHEA VI.7.5	LOW	Mandatory

EVP.GEN.12* services activation ATS requests by appropriate mean (ex RTF or equivalent) all services involved in the deployment/ cancelation of EVP procedures (visual and non visual aids, safety, rescue/ fire fighting, refueling, or maintenance services…). Each service immediately applies appropriate procedure and report to ATS by appropriate means either good execution, or incapacity.	To ensure a comprehensive deployment of EVP, and be timely alerted of possible deficiencies to be communicated to the crew.	CHEA VI.7.6	LOW	Mandatory
EVP.GEN.13 small works activities All activity such as small work or maintenance tasks on maneuvering area shall be interrupted during EVP. Presence of vehicle and persons are prohibited on maneuvering area.	To prevent possible collision during EFVS operation with operational credit on ground.		LOW	Mandatory
EVP.GEN.14 closing of aerodrome Fence must be closed and locked when EVP are active	To prevent the entrance in the movement area of vehicles, persons, or animals large enough to be a hazard to aircraft	CHEA VI.7.9 ICAO A14 §9.10	MED	Mandatory
EVP.GEN.18*PPR For aerodrome without LVP, EFVS operations with operational credit can be permitted on approved aerodrome with PPR only (Prior Permission Required). PPR must be requested to appropriate aerodrome authority before a delay that is defined locally by each aerodrome.	To ensure aerodrome is informed in advance that traffic intending to perform EFVS operation with operational credit is expected in order to help for the preparation of EVP, if needed. To make the ATS aware that an aircraft will have the capability to descent below decision height although weather is below minima.	Small Aerodrome input	LOW	Recommended

EVP.GEN.19 aerodrome training plan EVP must be considered in the initial and recurrent training plan of the aerodrome personnel	To ensure that the operator's knowledge and practice of EVP procedures is adequate	ICAO A14 ATT-27 §19	LOW	Mandatory
EVP.GEN.20 unserviciebility When long term activities such as constructions are in progress on the aerodrome and affects the movements on the aerodrome in low vis, or if service/ equipment requested for EFVS operation with operational credit is unserviceable, the operation is not permitted.	To ensure the safety level request for the operation	ICAO A14 10.5.13	LOW	Mandatory

EVP.GEN.3b* CAT I aerodrome with high traffic density

On CAT1 controlled aerodromes where HIGH traffic density is expected during low visibility conditions, specific traffic density criteria must be defined to compensate the lack of traffic awareness in low visibility and to cope with collision risk.

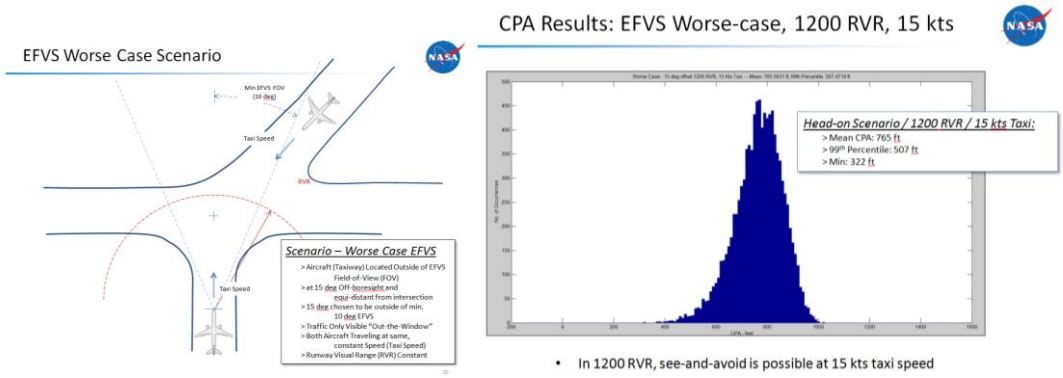
The complexity of the aerodrome layout and the presence of means like ground radar or ADSB out that allow to show to the ATC the ground traffic situation must be considered.

EVP.GEN.4* taxi speed limitation

In the frame of EFVS standardization works, NASA presented simulation for different scenarii (vision angle, visibility and taxi speed) to evaluate potential impact of EFVS on LVO/SMGCS in see-and-avoid surface operations. This study "*Analysis of See-and-Avoid in Surface Operations EFVS vs. Non-EFVS Ops*" was based on Monte Carlo Simulation and demonstrated that a limited taxi speed have positive impact on traffic collision avoidance.

Taxi speed of 15 kt was found as adequate for visibility as low as 1200ft RVR (400m) to enable the crew to timely detect collision and braking of the aircraft for the most severe scenario (min EFVS FOV of 20°, see here below).

Taxi speed of 5kt was found acceptable for the same scenario with 500ft RVR (150m).



NASA study showed that EFVS based surface operations are no less safe than non-EFVS operations. Moreover, it provides better safety when EFVS provides visual advantage (i.e., head-on) and it is no worse than natural vision otherwise (i.e., can turn off EFVS if performance is degraded).

Taxi speed limitation is especially important for aerodromes with HIGH traffic density where more than one movement at the time should be permitted.

In addition to collision avoidance, low taxi speed is a key point in the correct following of the assigned taxi route (cf EVPair.4).

EVP.GEN.5*

The assessment during approach through the HUD/ EFVS of both the real visibility (naked eye) and the enhanced visibility provided by the EFVS is a key point of the EFVS operation with operational credit. RVR communicated by ATS enables the pilot to decide if approach can be continued by

considering the computed Enhanced flight visibility, or if a safe landing (including in case of EVS image loss) can be envisaged by considering RVR (see §3).

Therefore, it is particularly important that ATS pays attention to the significant changes of RVR and announces it to the crew. As requested per AIR OPS CAT.OP.MPA.305 (see here below), significant changes of RVR should be announced at least down to 1000ft HAT to enable the pilot to make appropriate decision at this altitude, as it is for standard operations.

CAT.OP.MPA.305 Commencement and continuation of approach

(a) The commander or the pilot to whom conduct of the flight has been delegated may commence an instrument approach regardless of the reported RVR/VIS.

(b) If the reported RVR/VIS is less than the applicable minimum the approach shall not be continued:

(1) below 1 000 ft above the aerodrome; or

(2) into the final approach segment in the case where the DA/H or MDA/H is more than 1 000 ft above the aerodrome.

(c) Where the RVR is not available, RVR values may be derived by converting the reported visibility.

(d) If, after passing 1 000 ft above the aerodrome, the reported RVR/VIS falls below the applicable minimum, the approach may be continued to DA/H or MDA/H.

(e) The approach may be continued below DA/H or MDA/H and the landing may be completed provided that the visual reference adequate for the type of approach operation and for the intended runway is established at the DA/H or MDA/H and is maintained.

(f) The touchdown zone RVR shall always be controlling. If reported and relevant, the midpoint and stopend RVR shall also be controlling. The minimum RVR value for the midpoint shall be 125 m or the RVR required for the touchdown zone if less, and 75 m for the stopend. For aircraft equipped with a rollout guidance or control system, the minimum RVR value for the midpoint shall be 75 m.

Note: Per ICAO Annex3 §4.3.4, RVR, when available must be measured each minutes.

EVP.GEN.7*

Police, rescue and fire fighting services vehicles (SSLIA in French) that play an important role in achieving the safety, regularity and efficiency of AWO, are still allowed to circulate under specific local rules. These rules should guaranty that safety areas (such as OFZ, sensitive and critical areas) are not violated. It also ensures that there is no risk of collision with aircraft maneuver on maneuvering areas (e.i taxi, take off and landing areas).

EVP.GEN.8*

In order to be sure that EVP are in force at the time an aircraft arrives close to DA/DH (i.e the lowest of DH + 500ft or 1000ft), the decision of the deployment of the EVP must be made in advance.

EVP must be initiated neither too early (risk of never been in EVP weather conditions, or to be in EVP active for a too long period), nor too late (risk to ask to the traffic to wait for the EFVS with operational credit approach).

Therefore, and taking into account business aviation density of traffic on small/ medium aerodromes, it is proposed:

- To initiate the deployment of EVP on the aerodrome after the first contact of the traffic intending to performe EFVS operation with operational credit, with the control tower of the destination aerodrome,

- And provided weather conditions are below the minimum published RVR + a buffer defined locally.

In case the initial approach is managed by an other than DEST aerodrome ATS (for ex BORDEAUX in case of landing in PERIGUEUX), the deployment of EVP will occur at the first contact with the local ATS (when pilot announces its arrival and ask for information like wind or runway in service) . This delay corresponds to a minimum of 10-15 minutes before landing and is sufficient to guaranty all the services are in place and operational when aircraft starts its final approach. This delay is also sufficient to allow a human observer RVR measurement (VIBAL), if required.

In order to avoid EVP are maintained in place when EFVS traffic is LOW, it is proposed to make possible the cancellation of EVP after the pilot has left the frequency of the DEST aerodrome (on parking before switch off or after go around for diversion to another aerodrome).

EVP.GEN.10*
SSLIA will be appropriately located on airport when EVP are active. Dedicated areas must be choosen such as:

- It enables to timely access to aircraft in case of accident or incident
- SSLIA vehicules do not interfere with safety surfaces such as OFZ, or sensitive and critical areas in case of ILS
- It enable to make human observer measurements of TDZ RVR, if required

EVP.GEN.12*
Appropriate communication mean (ex: two way radio communication systems) must be available on the aerodrome to allows ATS and all other services concerned by EVP (maintenance services, works services…) to communicate with each other during EVP.

EVP.GEN.18*
On small/ medium aerodromes, as EVP are intended to be deployed at first contact, it may be challenging to put in place all the EVP in a short relatively delay (10-15 min).

That is why it is proposed to authorize EFVS operation with operational credit with PPR only.

As the activation of the EVP may depend on:

- local parameters like the complexity/ size of the aerodrome,

- and the frequency of this kind of operation on the aerodrome,
- the evolution of local weather,

it is proposed the PPR conditions (person to be contacted, mean and delay) are defined by local authorities.

See EVP.PUB.3 and ANNEXE A for impacts on AIP.

Note 3 about construction works: in case of construction on the aerodrome during EFVS operation with operational credit, a NOTAM is already published per standard procedure, and published minimum are possibly increased. Nothing more has to be plan for EFVS operation with operational credit. Safety is ensured by the fact the crew will consider new minima for the EFVS performance computation.

Note 4 about In failure equipement
This is the same as for construction works in case of second power failure, or lights failures… (CHEA V.7.6.1, CHEA V.7.6.2, CHEA V.7.6.3)

4.6 Specific ILS

This section describes additional requirements compare to general procedures (§4.5) to support safe and efficient EFVS operation with operational credit on ILS navigation mean.

These additional recommendations consist in proposing procedures to protect the CAT 1 ILS beam when aircraft operates below DA/DH by taking credit of EFVS (see §3) .

A star (*) at the end of the rule number indicates an additional substantiation is provided below the table.

EVP.ILS.X	Rationale for EFVS operation with operational credit/ impact	Regulation reference	Aerodrome effort indicator	Mandatory/ wishable
EVP.ILS.1* locking ILS is locked during EVP period	Limitation of perturbation of navigation mean	CHEA.VII.2.3 CHEA.IV.7.4.1 CHEA VI.7.7.1.2	LOW Already in place in Périgueux (LFBX)	Mandatory *Note 5*
EVP.ILS.2 multiple LOC In case of multiple LOC, only one LOC must be active below RVR1500m or ceiling below 400ft	Limitation of possible perturbation of navigation mean used for EFVS operation with operational credit approach (used for ex for take off on the same runway)	CHEA.VII.2.3 CHEA VI.7.7.1.3	LOW Most of EFVS operation with operational credit aerodrome candidates have 1 ILS	Mandatory *Note 5*
EVP.ILS.3a* beam protection On small/medium aerodromes without LVP, no other aircraft movement than EFVS aircraft between the beginning of final approach and the parking is allowed	Limitation of perturbation of navigation mean (mitigation for sensitive and critical area)	CHEA.VII.2.5 CHEA VI.4.2 CHEA VI.4.3 CHEA VI.5.1.2 CHEA VI.5.2.2 CHEA VI.7.7.1.1 CHEA VI.7.8.	LOW On small/ medium aerodrome	Mandatory *Note 5*
EVP.ILS.3b* beam protection On CAT1 aerodromes (without LVP) but with HIGH traffic density (ex Le BOURGET LFPB), criteria must be defined locally to ensure sensitive areas are clear of obstacle when A/C arrives at 2M from threshold. Critical areas must be clear of obstacles	Limitation of perturbation of navigation mean(mitigation for sensitive and critical area) / limit GA and diversion cases	CHEA.VII.2.5 CHEA VI.4.2 CHEA VI.4.3 CHEA VI.5.1.2 CHEA VI.7.8.2	LOW Same kind of procedure already in place in Bergerac LFBE	Recommended *Note 5*
EVP.ILS.4 constructions When constructions are in progress on the aerodrome such as it interferes with sensitive and critical areas, EFVS operation with	To guaranty safe operation on aerodrome	ICAO A10 Vol I attachment C and G CHEA.VI.7.3	LOW	Mandatory

operational credit are not permitted.				

Note 5:

If some of ILS related EVP procedures cannot be temporarily satisfied by the aerodrome, EFVS operation with operational credit approach remains possible but may result in a go around and a diversion due to inconsistency between EFVS and other flight information. If that temporarily situation occurs, ATS should announces: "**EFVS landing on runway XX not advisable**" (cf CHEA ANNEX A VII.2.3)

EVP.ILS.1*

Weekly check of ILS is not requested because EFVS concept is based on the combined use of a navigation mean (ILS for example) and EFVS.

EVP.ILS.3a*limitation of movement for aerodrome with low/medium density of traffic:

This enables to compensate for the activation of sensitive and critical ILS area, which may be "relatively complex" and may require new features on small/ medium aerodromes (like specific marking).

Moreover, configuration of small aerodrome runways may be such that there is only one runway exit, which requires the aircraft to maneuver on the runway before reaching the taxiway (ex LFSL Brives).

EVP.ILS.3b* limitation of movement in approach for aerodrome with high density of traffic

On aerodromes with high traffic density, specific traffic density criteria must be defined to prevent the perturbation of the navigation mean (ILS beam) and limit situation of GO AROUND (because EFVS operation with operational credit is based on the combined use of a guidance and an image). This means for example that Sensitive and critical areas must be clear of obstacle when aircraft in approach arrives at 2 NM from the threshold.

The presence of means providing a depiction of traffic to the ATC and the complexity of the aerodrome layout must be especially considered.

For example, the section VI.7.8.2 of the CHEA may be considered as a guideline :

4.7 Specific AFIS

AFIS aerodrome only provides information and alert services. It doesn't provide any clearance, as it is for controlled aerodromes (ATC). In practice, AFIS service gives information to pilots who are responsible of safety.

EFVS with operational credit remains possible on AFIS aerodromes and no additional recommendation is requested compare to operations on controlled airports.

All the recommandations proposed in the previous sections (§4.3 to §4.6) and next §4.8 section of that document apply.

Recommendation 3a is given in the table here below as an example.

EVP.AFIS.X	Rationale for EFVS operation with operational credit/ impact	Regulation reference	Aerodrome effort indicator	Mandatory/ wishable
EVP.AFIS.3a* limitation of movements On AFIS aerodromes, pilots shall ensure that there is no other aircraft movement than aircraft performing EFVS operation with operational credit between the beginning of final approach and the parking	Ensure safe EFVS operation with operational credit. Information and alert services only/ reduction GA and diversion, and reduction of ground collision risk		LOW Due to Low traffic in low vis conditions	Mandatory

EVP.AFIS.3a*:
For these operations, AFIS personnel informs the crew about the traffic and possible unserviceability. Depending on situation, phraseology could be
"**YOU ARE ALONE IN THE LANDING PATTERN**"
or "**ANY OTHER TRAFFIC IN THE PATTERN**"
or "**FOR INFORMATION, AN AIRCRAFT IS TAXIING TO THE RUNWAY XX FOR TAKE OFF**"
or "F**OR INFORMATION, AN AIRCRAFT IS IN FINAL RWY26**"
…

Based on this AFIS information, pilot decides to timely start the EFVS procedure.
As it is for controlled aerodromes, pilot informs AFIS personnel from his intentions.

Note: LPV approach is possible on AFIS aerodromes (LFBX-PERIGUEUX or LFOU-CHOLET for ex).

4.8 Publication of information in AIP

This section describes the information recommended to be published/ broadcasted in the aerodrome documentation/ NOTAM to support safe and efficient EFVS operation with operational credit on ground and in flight.
The published information must be easily accessible to the pilot when he prepares the approach.

PUB.X	Information to be published	reference	Rationale / comment
EVP.PUB.0 EFVS operation with operational credit authorization	"**EFVS on ILS authorized** *(or RNAV with minimum LPV or minimum LNAV/VNAV)*" must be added in the AIP AD 2.22. A note is added in the *observation/remark box* on the chart to inform the crew an EFVS with operational credit approach is authorized (see ANNEXE A). General information about EFVS operation with operational credit will be mentioned in AIP.	CHEA.VII.2.5	Ensure safe EFVS operation with operational credit/ Support operator in the decision making to perform EFVS operation with operational credit
EVP.PUB.0.5* Runway threshold accuracy	Runway thresholds of the runway that are used for EFVS operation with operational credit must be published in AIP with accuracy mentioned in ICAO	ICAO ANNEX 14 APPENDIX5 Table A5-1.	In order to guaranty the synthetic runway displayed in HUD is conformal enough to be used during the initial part of EFVS segment below DA/DH
EVP.PUB.1 LED lighting	When runway or approach lighting are LED based, this information must be mentioned in AIP 2.15	DASSAULT experience	The objective is to enable reliable sensor performance computation in case of LED which the emitting characteristics are different than incandescent lights
EVP.PUB.2 NOTAM	A NOTAM will be published to inform the airspace users the first time an approach is opened to EFVS operation with operational credit.	CHEA.VI.0.(9)	Inform the crew with new capability of some runways, including some specific limitations
EVP.PUB.3* PPR	For aerodrome without LVP, PPR, when requested by aerodrome must be mentioned in AIP 2.22 See ANNEXE A	DGAC/DASSAULT analysis	See EVP.GEN.18
EVP.PUB.4*	For all approaches where	DES.PROC.1	To provide appropriate

Climb gradient	EFVS operation with operational credit is authorized, the climb gradient enabling a safe go around below and beyond DA/DH must be published on the chart in the missed approach description box. See ANNEXE A for example of implementation		obstacle clearance in case of GO AROUND below and beyond DA/DH, possibly on the runway

EVP.PUB.0.5*

Because the pilot may not have vertical reference in the image when he gets visual contact through EFVS (threshold not always visible), it is proposed that runway symbology is used in lieu of EFVS runway. In order to guaranty the runway position is correct, it is required that the coordinates of the runway thresholds that are published in the AIP are checked to be consistent with the accuracy required by ICAO ANNEX 14, APPENDIX 5 table 5-1 and 5-2 for non precision approach.

EVP.PUB.3*

When PPR is requested by the aerodrome for EFVS operation with operational credit, conditions of PPR are proposed to be indicated in the AIP or in the upper part of the aerodrome chart. For example: **"*EFVS operation with operational credit possible on PPR from XXX before take off, ☎ XX XX XX XX*".** See ANNEX A for illustration.

EVP.PUB.4*

Because in some cases (see DES.PROC.1), the climb gradient requested for go around during EFVS operation with operational credit may be higher than those requested for departure procedure, it is proposed to publish this information for each EFVS operation with operational credit rather than referring to departure procedure.

Moreover, in order to make the information clear and unmistakable during preparation of mission or briefing of the missed approach in flight, it is proposed to publish this climb gradient constraints on the IAC in the field dedicated to the description of the missed approach procedure (cf ANNEX A).

4.9 Crew procedures

This section describes airborne procedure and phraseology proposed for EFVS operation with operational credit.

EVPP.X	Rationale for EFVS operation with operational credit/ impact	Regulation reference	comment
EVPair.M1 PPR request	If PPR is requested, pilot must get an approval for an EFVS operation with operational credit. Approval must be requested according to published information (see EVP.PUB.3)	Aerodrome/ Ops input	The objective is to be sure aerodrome will be ready to accommodate the aircraft in marginal weather condition at the time of arrival. It may also gives the opportunity to the crew to crosscheck the weather with localaerodrome.
EVPair.0* RVR capability Flight plan	Pilot must declare in the field 18 of the flight plan the RVR capability provided by EFVS. Text proposed is: **"EFVS RVR/nnn »**	Regional Supplementary Procedures §2.2.1 (SUPPS doc 7030)	For aerodrome traffic management, the objective is first to inform small/medium aerodrome that a traffic is scheduled although the weather is expected below published minima. Second, for air traffic management or regulation, it may avoid the flight plan is delayed (until condition are improved) by ATM center because of insufficient RVR capacity of the crew/ aircraft regarding limit required by some aerodromes in LOW VIS ("*exceptional conditions*")
EVPair.1 Phraseology	Pilot declares his intention to perform an EFVS operation with operational credit to the ATS at the first contact with approach traffic service Phraseology proposed is:	CHEA.VII.2.2 CHEA.VII.2.7	Consistent with cat II operation

	"F-WFBW –REQUEST RNAV[5] or ILS WITH EFVS"		
EVPair.2 EVP in force	Before final approach, pilot must ensure that EVP are in force and that valid RVR has been communicated.		To be sure that the EFVS operation with operational credit approach can be safely performed
EVPair.4 Ground speed reduction	Ground speed must be limited to 10kt during taxi	NASA expe Other LOW Vis procedure	Provide sufficient time to the crew: a) to promptly detect collision with other traffic like aircraft or vehicles during taxi and timely brake the aircraft, b) to properly taxi A/C according to the assigned taxi route.
EVPair.7* Sequenced Flashing Light	Where Sequenced Flashing Lights are available on threshold or ALS, pilot requests ATS for its activation	Flight tests	To maximize the enhanced flight visibility provided by the EFVS sensors
EVPair.8 Climb gradient	Crew must ensure that A/C, when operated during missed approach, will be capable of altitude/ climb gradient constraints required for EFVS operation with operational credit through EVP.PUB.4	PROC.DES.0 EVP.PUB.4	To ensure appropriate obstacle clearance in case of go around on runway
EVPair.9 Lighting setting	Pilot request ATS for MAX brightness setting for lightings.	ICAO A14 attachment A § 16.2	To maximize the enhanced visibility provided by the EFVS sensor without impairing pilot's vision

EVPair.0*:

In filed 18 of the flight plan, pilot indicates EFVS and RVR/nnn (for 300m forx ex) as mentioned in EUR SUPPs, Doc 7030: **"EFVS RVR/300"**

Note 6: The addition of "EFVS" text in the field 10 of the flight plan to indicate the EFVS capacity is assessed as not necessary, this information being already provided through field 18.

[5] LPV or LNAV/VNAV

Note 7: Big airports such as LFBD usually received only some basic parameters of the flight plan. In particular, field 18 is not part of the available information.

EVPair.1*:

Proposed phraseology for ATC is:

"**F WFBW AUTHORIZED FOR ILS CAT1 (OR RNAV) WITH EFVS APPROACH**"

EVPair.7*:

Sequenced Flashing Lights are very popular on ALS in foreign country, especially on simplified CATI lighting systems like MALSR, SALSF, SSALF… (see example here below)

The use of these systems may be not recommended during low vis operation because it may impair pilot's external natural vision (CHEA VI.7.7.2).

Regarding EFVS operation with operational credit, because these lights are located on the end part of the ALS (from threshold), they are the first to be seen by the sensor during approach, when vision is usually only EFVS based (no natural vision). Therefore, it is crucial theses system are ON during EFVS operation with operational gains to enable the pilot to get visual as early as possible.

Flight tests should demonstrate if there is nuisance in this kind of operation based on EFVS vision.

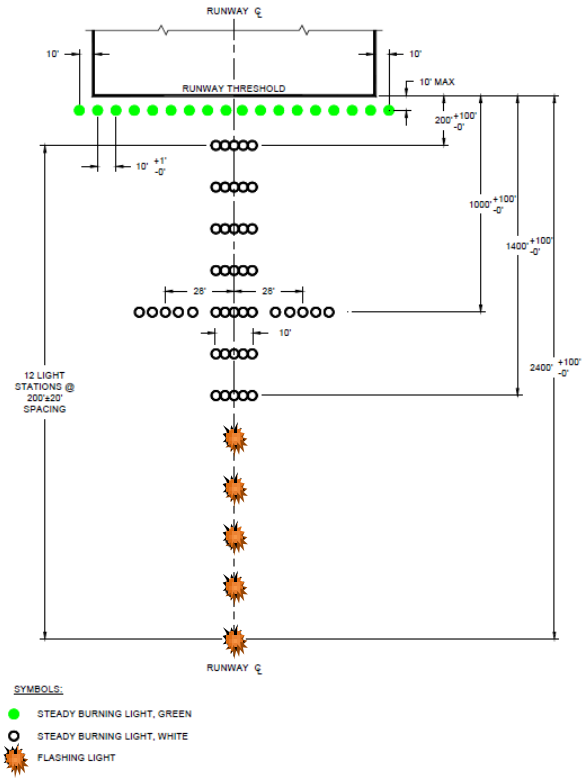


FIGURE 2-4. MALSR CONFIGURATION

4.10 Aircraft certification

This section reminds for information the main EFVS related items that are part of aircraft certification process. These points are demonstrated either by analysis, flight tests or simulator tests.

Because the following points depend on each aircraft performance and system behavior, they are not proposed to be considered as part of aerodrome recommendations.

For each point, a possible limitation will result from certification demonstration and will be published in the AFM.

CERT-AC.X	Rationale for EFVS operation with operational credit/ impact	Aerodrome Regulation link	comment
CERT-AC.1* Max final approach slope angle must be demonstrated	Must enable stabilized approach and landing in TDZ.	CHEA.VI.4.1.1	To be assessed with failures.
CERT-AC.2 Irregular terrain before runway does not interfere with operation	To be demonstrated per regulation (approach stabilized and finishing in TDZ)	CHEA VI.2.1	
CERT-AC.3 Slope of first 1/3 th of runway do not interfere with operation	To be demonstrated per regulation. Approach must be terminated in TDZ	CHEA VI.2.2	
CERT-AC.4* Quality of ILS below DA/DH does not interfere with operation down to the landing, and including the Rollout	to demonstrate that the system / procedure can accommodate a blend of ILS (GS and LOC) when pursuing below DA/DH	CHEA VI.4.1.3.1	

CERT-AC.5* Caracteristics of approach/ runway/ taxiway lighting	To demonstrate sufficient performance of EFVS and demonstrate the go around rate is consistent with normal operations	CHEA VI.5.3	To perform with different levels (no ILS, ALS 420m to1000m, with or without flashing lights, REIL…) and types of lightings (LED, incandescent)
CERT-AC.6 A/C is capable of required climb gradient when in GO AROUND mode	To ensure the aircraft when in the GO AROUND mode will be capable to satisfy the aircraft performance determined by the pilot.		

CERT-AC.1*:

Usually, a slope of 3° is targeted for normal operations. NPRM and existing EU OPS ‘requires 3.77°. Higher values may be demonstrated and will be published in AFM.

CERT-AC.4*

The perturbation of the GLIDE or LOC beam due to the presence of building/ environment or vehicle may have different consequences on continuation of the operation depending on A/C system design/ behavior and aircrew procedure proposed (especially regarding the use of the flight director during EFVS with Operational credit operation).

5. IMPACT ON PHRASEOLOGY

This section summarizes the phraseology proposed in the different sections here above for EFVS with Operational credit operation.

On ATC aerodromes:

CREW	**ATC (LVP or EVP)**
"REQUEST FOR ILS WITH EFVS"	
	"EVP (or LVP) IN FORCE" *"CHECK YOUR MINIMA"*

On AFIS aerodromes:

CREW	**AFIS**
"ESTABLISHED ON ILS FOR APPROACH WITH EFVS"	
	"EVP IN FORCE" *"CHECK YOUR MINIMA"*
	"FOR INFORMATION, AN AIRCRAFT IS TAXIING FOR TAKE OF IN RUNWAY 26" "FOR INFORMATION, AN EFVS APPROACH IS IN PROGRESS"

6. PRELIMINARY SAFETY ANALYSIS FOR AIR CONTROL AND AERODROMES

To be completed in a later edition with EPIS CA text

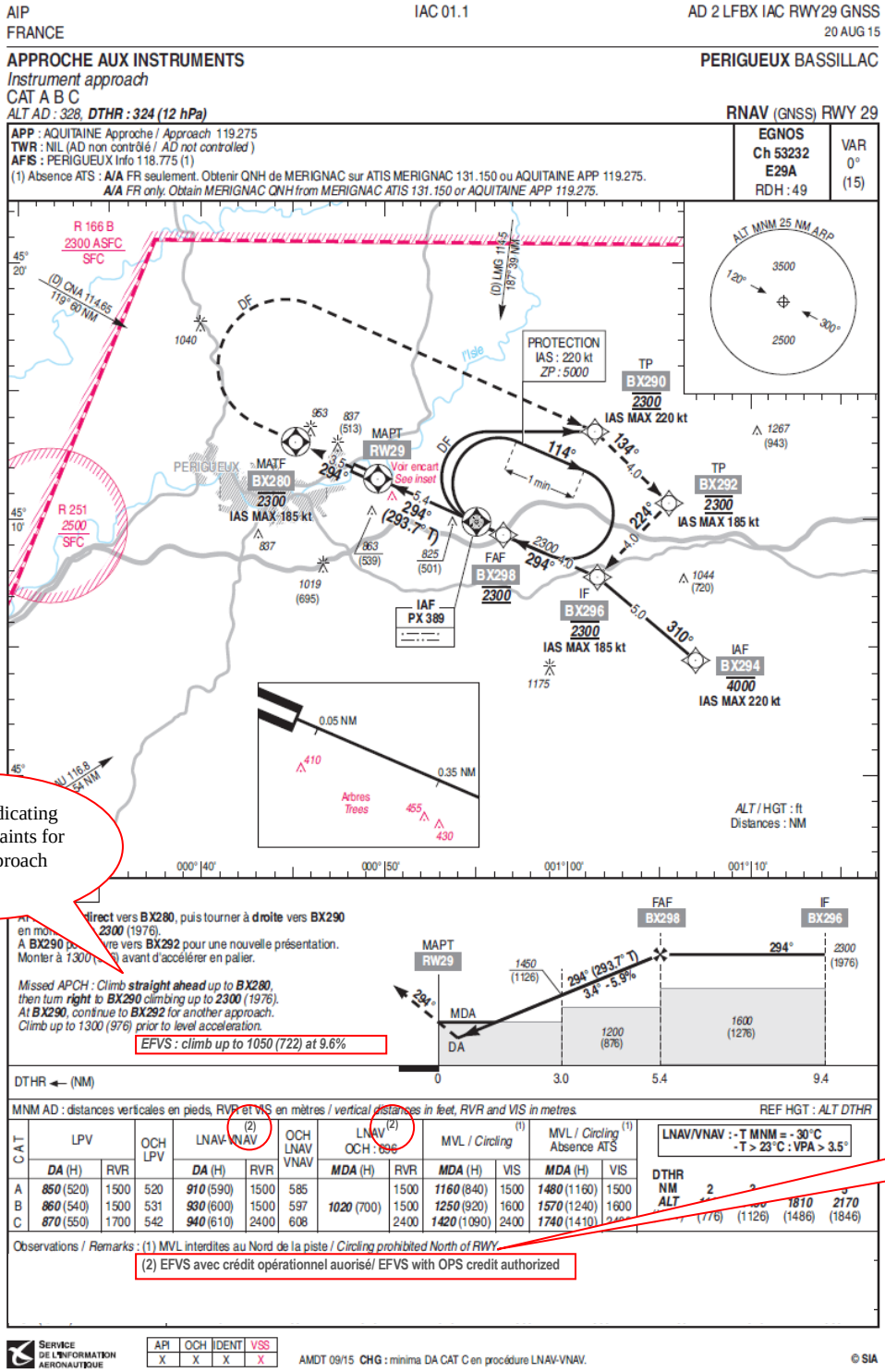
7. CONCLUSION

The review of French aerodrome regulation (CHEA) with DSNA and regular exchanges with services of small aerodromes of the project led to propose the herein recommendations regarding EFVS operation with operational credit.
The recommendations were used to write the aerodrome safety analysis that were then deployed and validated through real ground/ flight demo performed in good and degraded weather conditions.

In addition to this study performed jointly with DSNA, and to ensure EFVS operation with operational credit can be operated the same way all over European countries, Dassault will review these recommendations against European regulation (Euro13) and will share the study with Antwerp (EBAW) aerodrome in Belgium.

Before large consideration, Dassault recommends to extend the sharing of that study with other CAA who expect big benefits from EFVS operations with operational credit.
Dassault is proposing such activity in the frame of SESAR2020.

ANNEXE A. EXEMPLE OF EFVS CHART IMPACTS (NON LVP AERODROME)



The note indicating EFVS constraints for missed approach

The note indicating that EFVS approach is authorized

AIP
FRANCE

AD 2 LFBX ADC 01
28 MAY 15

CARTE D'AERODROME
Aerodrome chart
ALT AD : 328 (12 hPa)

Ouvert à la CAP
Public air traffic

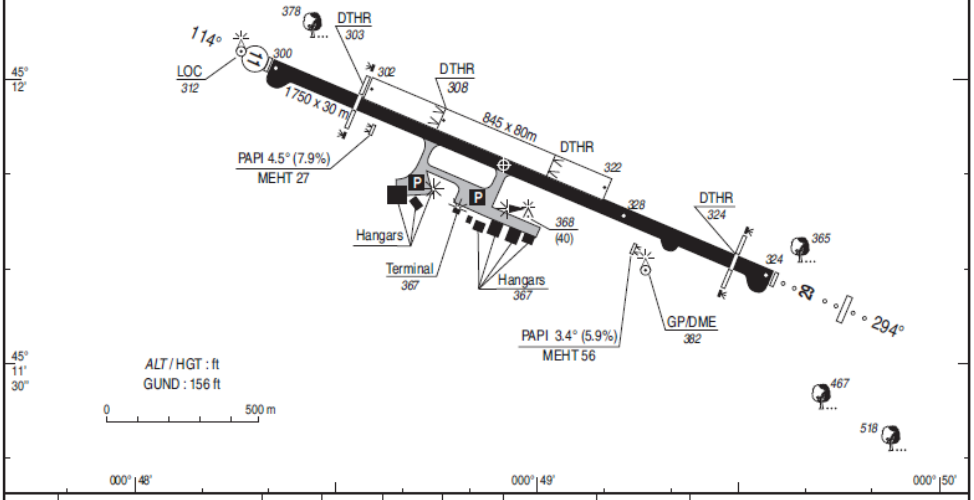
PERIGUEUX BASSILAC
45 11 51 N - 000 48 55 E

ATS : AFIS : LUN-VEN / *MON-FRI* : 0500-1100, 1300-1800, 2000-2130. ETE / *SUM* : - 1 HR.
En dehors de ces HOR / *Outside these SKED* : PPR PN 48 HR.
☎ 05 53 02 79 75 - FAX 05 53 02 79 78
Pour vols commerciaux officiels et sanitaires : ☎ (astreinte permanente) 06 08 82 98 68
For official commercial and medical flights : ☎ (permanent on call) 06 08 82 98 68
BRIA : BORDEAUX (Voir / *see* GEN 3.1).
AVT : automate AIR TOTAL (AVGAS 100LL uniquement) : H24 - JET A1 : HOR AFIS, carte VISA, chèque, espèces.
AIR TOTAL automatic dispenser (AVGAS 100LL only) : H24 - JET A1 : AFIS SKED, VISA credit card, cheque, cash payment.
Péril animalier / *Wildlife strike hazard* : Occasionnel / *Random.*
EFVS : avec PN PPR avant décollage au chef CA/ *with PPR PN before Takeoff from ATS manager*
☎ xx xx xx xx xx

VAR
0°

The PPR conditions to do EFVS operations

TYPE	LATITUDE	LONGITUDE
THR 29	45° 11' 38.75" N	000° 49' 34.27" E
DTHR 29	45° 11' 40.45"N	000° 49' 28.75" E
THR 11	45° 12' 01.48" N	000° 48' 20.77" E
DTHR 11	45° 11' 57.60" N	000° 48' 33.33" E



RWY	BALISAGE / *Lighting* APCH	BALISAGE / *Lighting* RWY	TORA	TODA	ASDA	LDA	NATURE *Surface*	RESIST. *Strength*	MINIMUM TKOF (RVR : m) CAT A	CAT B	CAT C	CAT D
11	NIL	LIH/LIL	1750	1750	1750	1450	Revêtue *Paved*	31 F/C/W/T	250*	250*	250*	-
29	420 m	LIH/LIL	1560 (1)	1750	1560 (1)	1430 (1)			250*	250*	250*	-
			(1) voir observations / *see remarks*						* Absence ATS : 550 m .			

~~CONSIGNES RECOMMANDEES POUR UN DEPART IFR / *Recommended instructions for IFR departures*~~

RWY 11 : Monter RM 114° jusqu'à *1050* (722) à 11% (2) puis route directe en montée jusqu'à l'altitude de sécurité en route.
RWY 29 : Monter RM 294° jusqu'à *1050* (722) à 9,6% (3) puis route directe en montée jusqu'à l'altitude de sécurité en route.
RWY 11 : Climb MAG 114° up to 1050 (722) at 11% (2) then direct route climbing to en-route safety altitude.
RWY 29 : Climb MAG 294° up to 1050 (722) at 9.6% (3) then direct route climbing to en-route safety altitude.

The take off climb gradient/ altitude constraints

BALISAGE / *Lighting* :
RWY 11/29 : DTHR - Extrémités : HI/BI
RWY 11/29 : DTHR - RWY ends : LIH/LIL

OBSERVATIONS / *Remarks* :
Résistance TWY et PRKG / *TWY and PRKG strength* : 26 F/C/W/T.
(1) Distances déclarées utilisables : TORA, ASDA, LDA RWY 29 réduites cause présence d'un shelter à 110 m de la DER.
Usable declared distances : TORA, ASDA, LDA RWY 29 reduced due to the presence of a shelter 110 m from DER.
(2) Obstacles constitués par des arbres / *Obstacles made up of trees* :
- ALT 365 ft à 34 m de la DER et 122 m de l'axe / *ALT 365 ft, 34 m from DER and 122 m from RWY axis,*
- ALT 467 ft à 284 m de la DER et 204 m de l'axe / *ALT 467 ft, 284 m from DER and 204 m from RWY axis,*
- ALT 518 ft à 520 m de la DER et 272 m de l'axe / *ALT 518 ft, 520 m from DER and 272 m from RWY axis.*

Ces obstacles déterminent des pentes de montée respectives de 23%, 14,4% et 12,4%.
These obstacles imply respectively 23%, 14.4% and 12.4% climb slopes.
(3) Obstacles constitués par des arbres : ALT 378 ft à 170,6 m en amont de la DER et 139 m de l'axe, déterminant une pente de montée de 13,6% / *Obstacles made up of trees : ALT 378 ft, 170,6 m upstream DER and 139 m from RWY axis, implying a 13.6% climb slope.*

SERVICE DE L'INFORMATION AERONAUTIQUE

AMDT 06/15 **CHG** : VAR, HOR, AVT, MNM TKOF absence ATS, consignes DEP, observations.

© SIA

Example of chart modification with PPR information for Périgueux (without AIP text sheet)

ANNEXE B. DENSITY OF TRAFFIC

The density of traffic is defined per ANNEX 14 vol 1 §1.1 of ICAO as follows:

Aerodrome traffic density.

- *LIGHT*. Where the number of movements in the mean busy hour is not greater than 15 per runway or typically less than 20 total aerodrome movements.
- *MEDIUM*. Where the number of movements in the mean busy hour is of the order of 16 to 25 per runway or typicallybetween 20 to 35 total aerodrome movements.
- *HEAVY*. Where the number of movements in the mean busy hour is of the order of 26 or more per runway or typicallymore than 35 total aerodrome movements.

Note B1.— The number of movements in the mean busy hour is the arithmetic mean over the year of the number of movements in the daily busiest hour.
Note B2.— Either a take-off or a landing constitutes a movement.

ANNEXE C. CONSOLIDATION DEMO TESTS POINTS

This ANNEX C contains the list of points intended to be assessed during fligt tests consolidation session.

reference	item
INT.2	Check that RVR can be transmitted within 5 min delay after measurement
INST.1B	Check the top limit for RVR Human observer measurement
Note 2 INST.1B	Record ceiling information and check reliability at DH (to be checked)
§3 and INST.7	Check that the absence of runway centerline is acceptable (approach and rollout)
INST.7	Assess the Influence of Switch over time of 1 sec during approach
EVP.GEN.8, EVP.GEN.10, EVP.GEN.12, EVP.GEN.7, EVP.ILS.1 & 2	Check that activation conditions (first contact and RVR threshold) of EVP are appropriate: adequacy of delay for services activation (SSLIA, VIBAL…)
EVPair.9	Assess if ALS/runway light MAX setting may impair the crew when breaking out the clouds.
EVP.GEN.11	Assess “EVP IN FORCE” ATS phraseoloy
EVPair.1	Assess “REQUEST ILS WITH EFVS” Pilot’s phraseology
EVP.GEN.18, EVP.GEN.14, EVP.GEN.10, EVP.GEN.13, EVP.GEN.19, EVP.GEN.20, EVP.ILS.4 EVPair.M1	Assess if PPR request is adequate to enable the airport to be prepared to the activation of EVP (aerodrome closed, locking of ILS…). Assess if PPR conditions are appropriate for the operation
EVP.GEN.3a, EVP.AFIS.3a, EVP.ILS.3	Check that limitation of traffic to one movement is appropriate on small and medium aerodrome
EVPair.7	Check that sequenced flashing lights (i.e REIL) do not impair pilot vision during approach when breaking out clouds.
DA	Check that the absence of A/C pulse lights and landing lights is acceptable from a control standpoint, especially during night operations
EVP.PUB.X	Check that EFVS related information mentioned in AIP as proposed in the

EVPair.8	herein document (climb gradient, PPR, approaches that are aiuthorized) is appropriate.
EVPair.0	Check that the information of capability of RVR mentioned in the field 18 of the Flight plan is appropriate (pilot and ATM).
EVP.GEN.4	Check that ground speed limitation (10kt) is appropriate