

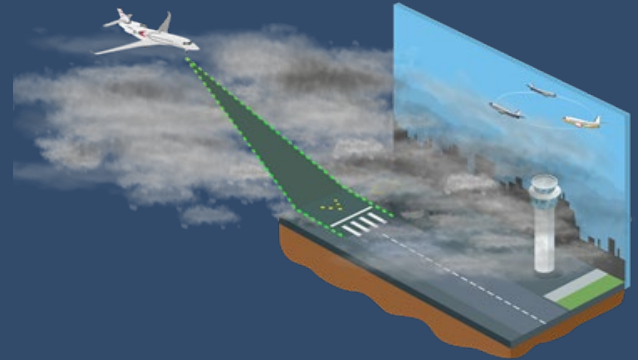
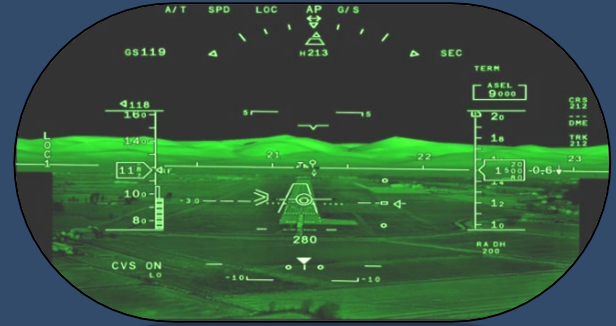
NON PROTEGE



EASA BIZJET WORKSHOP

EFVS status

22 JANUARY 2025, KOLN

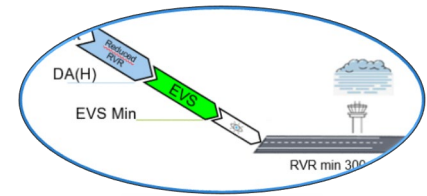
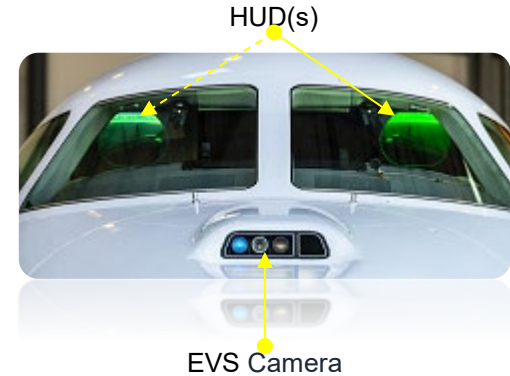


AGENDA

- **Introduction**
- **Benefits**
- **Deployment on Falcon**
- **“Blocking points”**
- **Future of EFVS**

EFVS INTRODUCTION

- **EFVS = HUD + EVS Camera**
- **Real time Image of external world (from EVS), displayed in HUD along with primary flight symbology,**
- **Can be approved to conduct EFVS operations**
! An image displayed in head down is not an EFVS, but still EVS !
➔ not eligible to EFVS OPS credit.
- **EFVS credits : Take credits of the EVS image, that see beyond natural vision, to go lower than approach minima (either at night or when visibility is degraded...)**
- **Technology: In 2024 EFVS are based on optronic sensors, i.e InfraRed and visible**
 - Some of them are multispectral and capable of LED lights

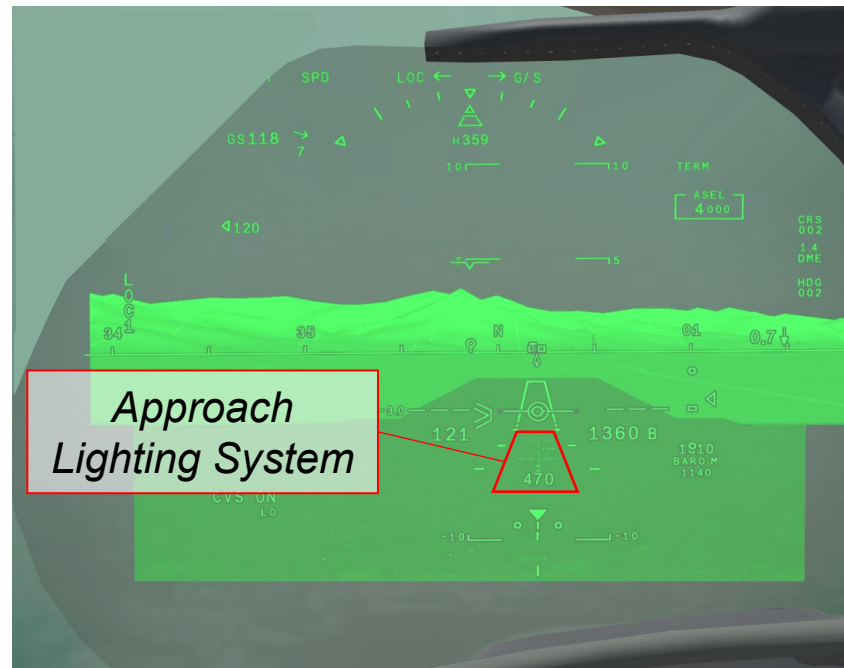


EFVS OPS BENEFITS: EXAMPLES OF OPERATIONS WITH OPS CREDIT

Without EVS image

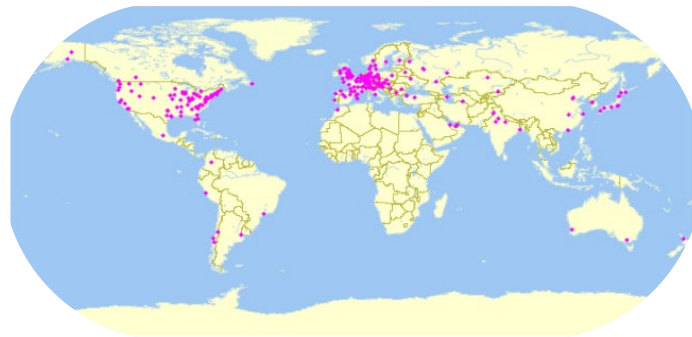


With EVS image



EFVS OPS BENEFITS: EXPAND ACCESS AT MANY AERODROMES IN ADVERSE WEATHER

- 2200 ILS CAT I Worldwide vs 400 CAT II/III
- 860 LPV in Europe vs 200 CAT II/III



Cat II/ III

➔ EFVS gives access to most of worldwide airports in degraded weather conditions

EFVS DEPLOYMENT ON FALCON FLEET

- **EFVS-A (“100ft”) certified on Falcon since 2012 (2016 for FalconEye).**
- **~100% of F8X and F6X are equipped with EFVS**
- **All Operators use EFVS first for situational awareness**
 - At night, during taxi, or to see clouds during cruise ...
- **OPS credit is gaining wider acceptance. More and more operators are approved by their National Authority:**
 - Falcon Operators approved in Switzerland, Germany, Sweden, UK, Luxembourg...
- **Top 5 airport wish list for EFVS according to operators:**
 - Le Bourget, Geneva, Zurich, Antwerp, Rotterdam...
- **EFVS is beneficial for:**
 - SAFETY
 - OPS EFFICIENCY
 - Positive impact on environmental footprint



EFVS OPERATION « BLOCKING POINTS »

EASA regulation is in place, Falcon A/C are certified and equipped, operators are approved, the process to declare an approach eligible for EFVS is clear ...

BUT EFVS operation is still too often NOT POSSIBLE !

➔ EFVS suitability still missing in AIPs:

1. LED status on Approach Lighting Systems ➔ Required to be declared in AIP 2.12 since 2022¹

In 2025, can operators consider that the absence of information about LED in AIP 2.14 means no LED ?

2. VSS penetration status ➔ Required to be declared and detailed in AIP 2.25 since 2022²

A table with minima impacted by a VSS penetrated, if any, should be provided in AIP, as required by EASA regulation². That level of information is most of the time still missing in AIP in 2025 ! (see example next slide)

In 2025, can operators consider that the absence of VSS information in AIP means that VSS is not penetrated ?

Note: OFZ, when available at a CAT 1 airport should be mentioned in 2.12 table. It may be still not the case...

EXAMPLES OF MISSING INFORMATION

- **VSS***: 2.25 section of AIP missing, empty or misleading:
 - Netherland
 - Germany
 - Belgium
 - Denmark
 - Ireland
 - Estonia
 - Italy
 - Norway
 - Portugal
 - Romania
 - Sweden
 - France (impact on minima sometime not detailed)
 - ...
 - **LED** present on ALS but not declared in AIP (examples):
 - EDDG.
 - EKKA.
 - EETN.
 - LIPX.
 - LFLL.
 - ...
- *Visual Segment Surface*

EFVS OPERATION « BLOCKING POINTS »

- Aircraft operators are usually EITHER CATII/III approved OR EFVS approved
- CAT II/ III aerodromes are eligible for EFVS operations
- However, when LVP are in force, some of them limit access to aircraft capable of CAT II/ III only

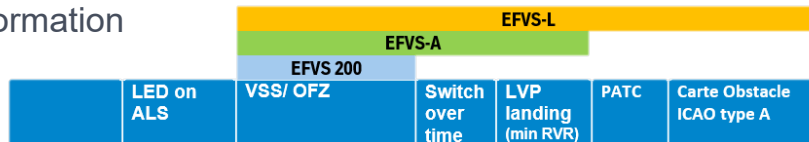
→ CAT II/III airports should extend LVP operations to EFVS “aircrafts”

→ EFVS capacity can be indicated by aircrafts in Field 18 of ICAO FPL (free text)

CONCLUSIONS

- **EASA to ensure European AIPs are compliant with 2022 update of EU 139/2014 regulation**

- Verify that AIPs are updated with EFVS required information



- **In addition, strong need from operators for a“EFVS –X label” on the charts:**

- To clarify the suitability of an approach minima for an EFVS operation (check of VSS/ OFZ...)
- See *proposal on spare slide*

➔ **EASA to encourage the States and the Aero Info Service Providers* to consider EFVS operations**

Geneva Airport LSGG is currently evaluating the possibility of including a note in the AIP indicating “Runway/ minima suitable for EFVS-X operations,”

- **EASA to continue to communicate about EFVS operations at aerodrome/ ATC/ ANSP level**

- Aerodromes/ ANSPs to Consider the need to publish adequate LVP procedures in AIP to allow EFVS-A or –L
- Focus first on aerodromes having already LVP for Take off !

- **ANSP/ aerodromes to take into account EFVS in NOTAM when relevant (e.g temporarily VSS penetration)**

... FUTURE OF EFVS

Short term:

- **State/ Aerodrome/ ANSP to make available aerodrome Information for EFVS operations**

Mid term:

- **Use of millimeter wave technology for ALL WEATHER EFVS OPERATIONS → still in R&D domain**
 - Enabler for New EFVS operations proposed in EUROCAE WG79/ ED 327...
 - /!\ Show stopper /!\:
 - Mitigation with “Fixed telecom service” in the 32GHz band is NECESSARY !
 - Support of EASA @ WORLDWIDE level is expected (ITU/ICAO FSMP, ECC/ EASA, FCC/ FAA, SRCC/ CAAC...)
 - Technical Challenges: A/C integration vs performance

MATERIALS

- **EASA AWO Link**
 - <https://www.easa.europa.eu/community/topics/all-weather-operations-0>
- **Webinar EASA EFVS:**
 - <https://www.easa.europa.eu/en/newsroom-and-events/events/3rd-easa-webinar-all-weather-operations>
- **AWO implementation guide:**
 - <https://www.easa.europa.eu/community/system/files/2024-03/AWO%20implementation%20manual%20V1.3%20dated%2007.03.2024.pdf>
- **ESSP implementation guide on SBAS:**
 - <https://www.essp-sas.eu/communication/news/publication-guidelines-use-efvs-sbas-operations/>
- **French Amendment to CHEA**
 - <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000050335236>
- **FAA OSR update with clarification about LED (nov 2024)**
 - <https://drs.faa.gov/browse/excelExternalWindow/DRSDOCID123669883220241118175423.0001?modalOpened=true>
- **EASA conversation aviation magazine p 23**
 - <https://www.easa.europa.eu/community/system/files/2023-03/Conversation%20Aviation%20-%2001%202023.pdf>
- **EFVS deployment**
 - <https://www.youtube.com/watch?v=nR7Qsi42Jes>



THANK YOU

EFVS LABEL IN CHARTS: PROPOSAL

1. **On the Instrument approach Chart**, to add an asterix close to minima that have been found eligible for an EFVS operation from the aerodrome regulation standpoint, and possibly clarifying the min RVR possible at the airport.

- « *suitable for EFVS 200. Min RVR is 550m* » or
- « *suitable for EFVS-A. Min RVR is 350m. LVP must be in force below RVR 550m* »
- ...

Note: Same logic as for approaches prohibited at night

2. **In general AIP**, to add a text clarifying that “suitable for EFVS-XXX” means that the aerodrome characteristics have been verified compliant with EU 139/ 2014. Other OPS criteria (LED impact on performance of the system, offset, missed approach procedure...) remain to be checked by aircraft operators.

EFVS AERODROME RELATED INFORMATION IN AIP: PROPOSAL

- **In a general section of the AIP,**
 - to publish a list of aerodromes/ Instrument procedures/ Minima with a up to date status for the suitability criteria required for EFVS operations
 - Same logic as for meteorological info in *part 1 Gen 3 service section* for example ?
 - Starting point can be the list of airports having reduced minima for take off (usually exposed to adverse weather conditions)

Example

		EFVS-L				
		EFVS-A				
		EFVS 200				
	LED on ALS	VSS/ OFZ	Switch over time	LVP landing (min RVR)	PATC	Carte Obstacle ICAO type A
LSGG ILS, LPV	yes	not penetrated/ No	1sec	yes (350m)	no	yes
...						

3 TYPES OF EFVS OPERATIONS

