

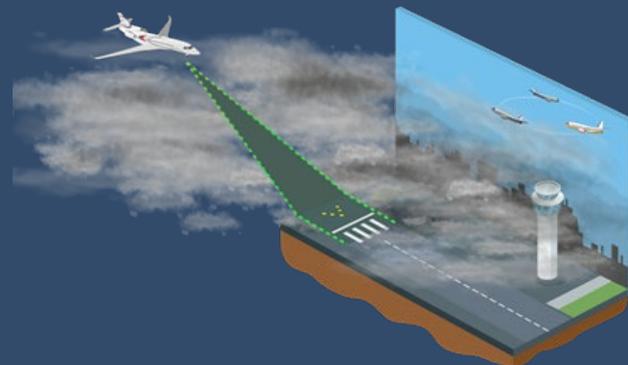
NON PROTEGE



# EASA BIZJET WORKSHOP

## EFVS status

22 JANUARY 2025, KOLN

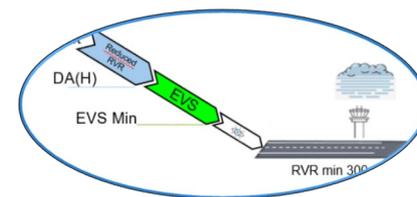
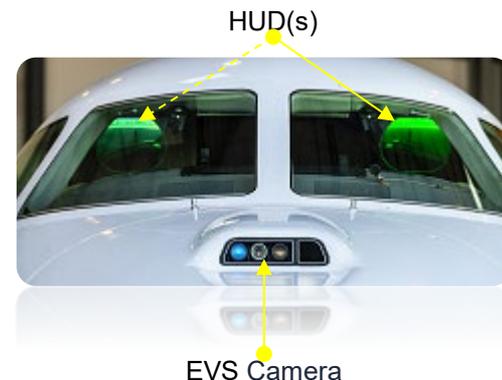


## AGENDA

- **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

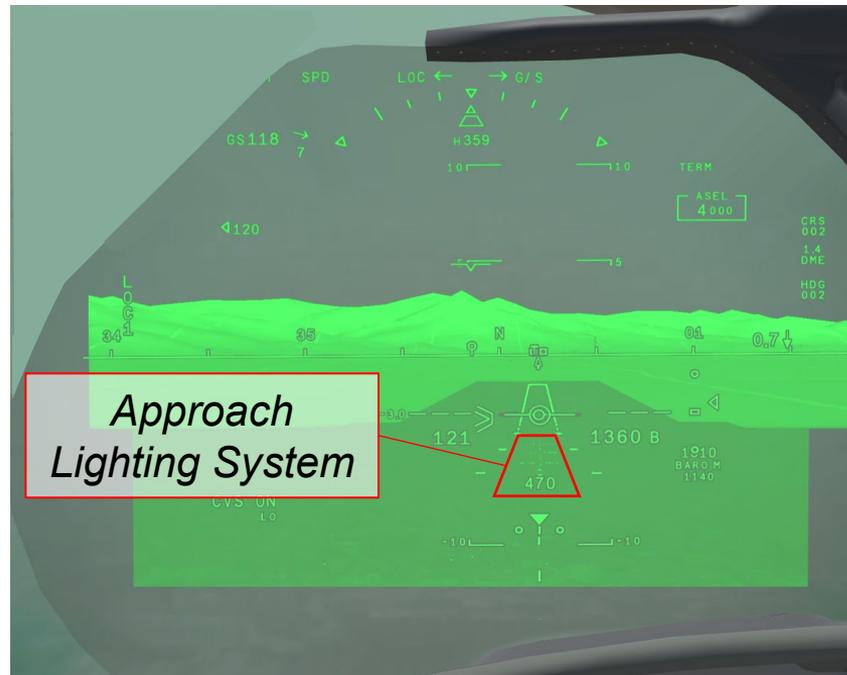


## EFVS OPS BENEFITS: EXEMPLES OF OPERATIONS WITH OPS CREDIT

*Without EVS image*

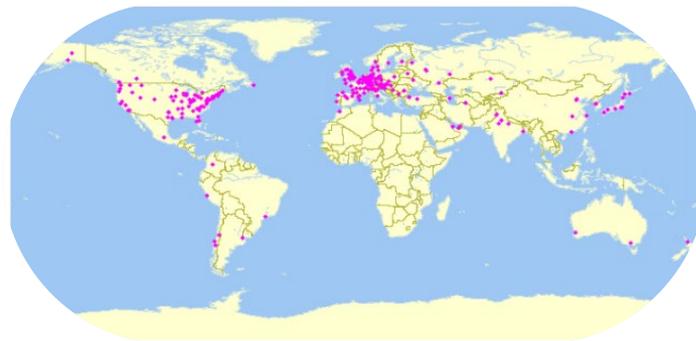


*With EVS image*



## 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 2022<sup>1</sup>

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 2022<sup>2</sup>

A table with minima impacted by a VSS penetrated, if any, should be provided in AIP, as required by EASA regulation<sup>2</sup>. 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...*

## EXEMPLES OF MISSING INFORMATION

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- **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 »

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- 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

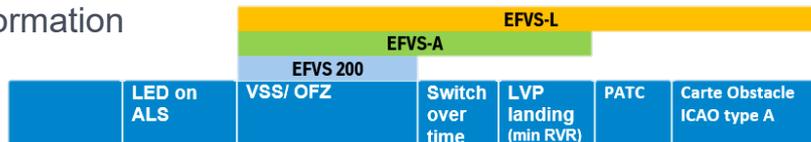
→ CAT II/III airports should extend LVP operations to EFVS “aircrafts”

→ 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

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### 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 @ WORLWIDE level is expected (ITU/ICAO FSMP, ECC/ EASA, FCC/ FAA, SRCC/ CAAC...)
  - **Technical Challenges: A/C integration vs performance**

## MATERIALS

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- **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

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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

