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Operational Suitability Report (OSR)

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Operational Credit for Enhanced Flight Vision Systems (EFVS)

Flight Technologies and Procedures Division

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RECORD OF REVISIONS

Revision Number	Sections	Date	Administrator
0 (Original)	All	07/02/2018	C. McLellan
1	1, 2, 3, 4, 5 and Appendix 1	08/22/2018	C. McLellan

Highlights of Change:

- 0. Original Document all Sections
- 1. Changed “EFVS Minimum Visibility” to “Minimum Visibility for Use with EFVS” throughout sections 1-3, Deleted paragraph 3.2, changed values in table in section 5 from fractions to percentages, added part 129 to lists of affected operators, and Added Kollsman EVS-SP, Kollsman EVS-II, and Kollsman EVS-I system performance information to Appendix 1

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1. PURPOSE.

1.1 This Operational Suitability Report (OSR) publishes a means for applicants (aircraft manufacturers) to establish the eligibility of an EFVS sensor installation for operational credit. Only EFVS installations that have demonstrated sensor performance (visual advantage) are eligible to utilize certain provisions of operational authorizations available to Title 14 of the Code of Federal Regulations (14 CFR) part 121, 125, 129, or 135 operators. These provisions allow pilots to initiate an instrument approach procedure (IAP) or dispatch/release to a destination in reduced visibilities (*Minimum Visibility for Use with EFVS*). A certificate holder obtains authorization to use *Minimum Visibility for Use with EFVS* through the operational application process for Operations Specification (OpSpec) C048, Enhanced Flight Vision System Operations. The Flight Technologies and Procedures Division publishes EFVS sensor installations eligible for operational credit in the appendix of this report.

1.2 This OSR does not provide training, checking, and currency information for an EFVS, which is found in both regulations and the applicable Flight Standardization Board (FSB) report and/or OSR.

1.3 The Flight Technologies and Procedures Division reserves responsibility and authority to reevaluate and modify sections of this report. Direct questions, comments, and change proposals to this document to the Flight Technologies and Procedures Division.

2. APPLICABILITY.

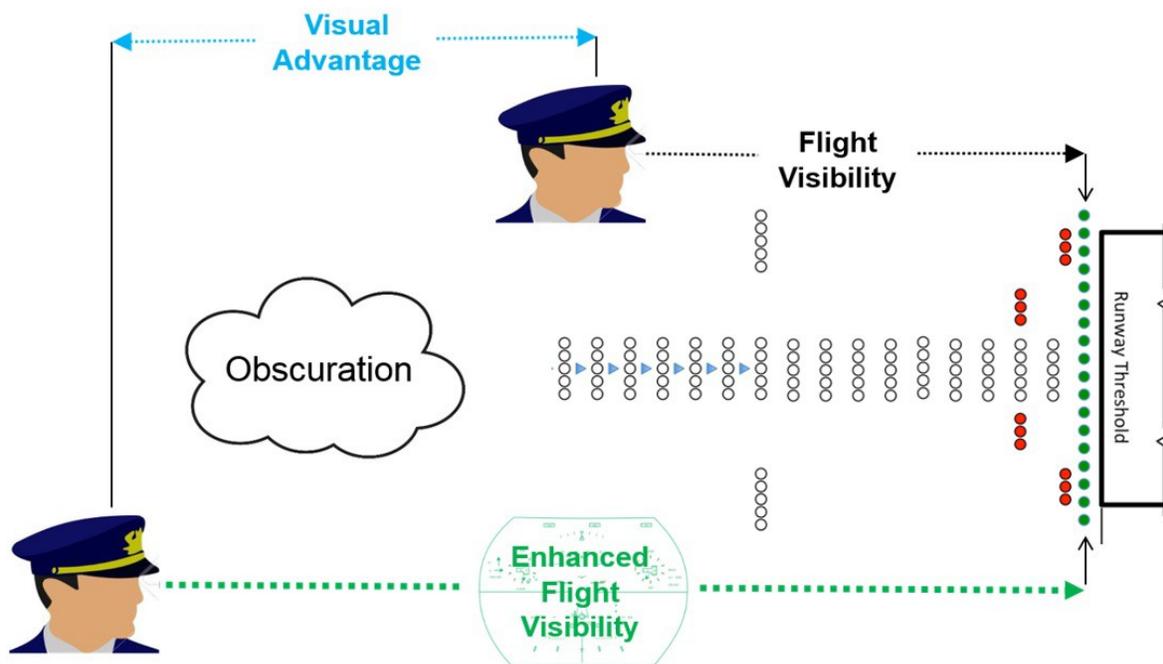
2.1 FAA principal operations inspectors (POI), in coordination with the Flight Technologies and Procedures Division, use Appendix 1 of this report when authorizing the use of *Minimum Visibility for Use with EFVS* in OpSpec C048.

2.2 Individuals interested in measuring or demonstrating the performance of an EFVS sensor to establish eligibility for operational credit should reference this report to become familiar with operational requirements.

2.3 Flight Standards Service pilots of the Aircraft Evaluation Division should use information in this report to support applicants demonstrating EFVS sensor performance with the intention of establishing eligibility for operational credit.

3. DEFINITIONS.

3.1 Visual Advantage. Visual advantage is the measured difference between the distance required to see an object with natural vision and the distance required to see that object with the enhanced vision provided by an installed EFVS sensor. Visual advantage may vary depending on the atmospheric conditions between the observer and the object.



4. **OPERATIONAL CONCEPT BACKGROUND.** The FAA published regulations in December 2016 that enable parts 121, 125, and 135 operators to depart to a destination or begin an instrument approach when reported visibility is below the minimum visibility prescribed for the IAP using a certified EFVS. Part 129 operators gain their provisions through their foreign authority and their FAA Operations Specification. The Flight Technologies and Procedure Division developed a concept for the implementation of EFVS operational credit with the following objectives:

4.1 Performance-Based. The preamble to the EFVS regulations states demonstrated performance of the EFVS sensor determines the operational credit. The Aircraft Certification Service (AIR) is developing a means to demonstrate this performance during the certification process. Flight Standards will determine if the demonstrated performance is eligible for operational credit during the certification process when possible.

4.2 Standardization. Standardize operational credit between aircraft manufacturers that install the same sensor, or operators who use the same sensor.

4.3 Simplicity. Develop an operational credit that is intuitive for the pilots and is not excessively complicated to apply.

4.4 Operational Impact. Develop an operational credit that when used properly does not create undue operational disruptions (e.g., missed approach) caused by system non-performance.

4.5 International Harmonization. Harmonize with foreign authorities to the greatest extent possible to facilitate global use of EFVS.

5. EFVS VISUAL ADVANTAGE DEMONSTRATION. Only EFVS installations that have demonstrated visual advantage are eligible to utilize certain provisions of operational authorizations available to part 121, 125, 129, or 135 operators. These provisions allow pilots to initiate an IAP or dispatch/release to a destination in reduced visibilities. The greater the visual advantage an EFVS sensor can demonstrate will result in a greater reduction in the required visibility to dispatch or begin an approach.

5.1 Who Evaluates Demonstrated Performance? The applicable Aircraft Certification Office (ACO) evaluates demonstrated visual advantage intended to support the authorization of operational credit. In most cases, the evaluation will take place during the certification process. The applicable Aircraft Evaluation Group (AEG) provides support during the evaluation and applicants should notify the AEG of any planned visual advantage demonstrations. The applicable AEG should conduct a visual advantage evaluation on a previously certified EFVS if the evaluation was not conducted during the initial certification process.

5.2 What Performance is An EFVS Sensor Required to Demonstrate? On average, an installed EFVS should provide the visual advantage equal to or greater than that required for a specific visibility to be considered for that particular credit listed in the table below:

Visual Advantage Required			
Visibility	25% Credit	33% Credit	50% Credit
1000	333	500	1000
1200	400	600	1200
1400	466	700	1400

An EFVS unable to demonstrate the ability to provide at least the minimum visual advantage values for the 25% credit column may not be eligible for operational credit.

There should be a number of demonstrations to provide sufficient confidence in the performance.

The greater the visual advantage an EFVS sensor can demonstrate, the greater the operational credit the EFVS sensor will be eligible for.

6. DETERMINING ELIGIBILITY FOR EFVS OPERATIONAL CREDIT.

6.1 Who Determines Eligibility for Operational Credit? The Flight Technologies and Procedures Division, with the assistance of the appropriate AEG, determines if the EFVS sensor performance demonstrated during the certification process meets the requirements for

establishing eligibility for operational credit. Coordinating with the applicable AEG early in the certification process will make the determination of eligibility a more efficient process. An applicant intending to establish eligibility of an EFVS sensor for operational credit should provide the following to the Flight Technologies and Procedures Division:

- 1) A letter addressed to The Flight Technologies and Procedures Division stating the performance the EFVS has demonstrated.
- 2) Sections of the Airplane Flight Manual (AFM) or Airplane Flight Manual Supplement (AFMS) related to demonstrated performance.
- 3) Data related to demonstrated performance recorded during the certification process.
- 4) Data collected from operational flight demonstrations provided by aircraft manufacturers or operators.
- 5) Data related to demonstrated performance provided by the manufacturer of the EFVS sensor.
- 6) Supporting information from the appendix of this report such as previous demonstrations of eligibility for the same sensor in different or similar installations.

The applicant should present the data in a clear and understandable format. Data presented in a tabular format is preferred.

If the provided information is insufficient to establish eligibility for operational credit, Flight Standards may require additional data or an operational flight demonstration. The applicable AEG will conduct additional operational flight demonstrations if required. The applicant is responsible to provide an aircraft, a flight demonstration plan, and any additional resources to accomplish a flight demonstration when required. Applicants should plan to perform operational flight demonstrations concurrently during the certification process to efficiently utilize available resources. Applicants should coordinate with the ACO and the FSB pilot conducting the operational suitability determination of the project early in the certification process.

6.2 What is An Operational Flight Demonstration? An observation of EFVS performance on an approach to ensure the EFVS provides sufficient enhanced flight visibility to conduct an EFVS operation. The approach flown should meet the following criteria:

- 1) Provides vertical guidance to a 200 ft Decision Altitude (DA).
- 2) Published 1,800 RVR line of minima and touchdown zone (TDZ) RVR reporting.
- 3) Installed medium intensity approach lighting system.

6.3 What Should Be Recorded on An Operation Flight Demonstration? Applicants should record the following information for each operational flight demonstration of EFVS operations:

- 1) The IAP flown (i.e., ILS OR LOC RWY 28, KBWI).
- 2) The reported airport weather at the time of the approach. The report should include the reported RVR for the landing runway, obscuration type, and precipitation type (if applicable).
- 3) An assessment at DA as to whether or not sufficient enhanced flight visibility was provided by the EFVS sensor (as installed) to descend below the DA in accordance with 14 CFR part 91, § 91.176. There is no requirement to proceed below DA to make this assessment. Postflight assessments, including those determined through the use of video, may be considered.

The Flight Technologies and Procedures Division, with the assistance of the appropriate AEG, will determine if there is sufficient EFVS sensor performance data to establish eligibility for operational credit. Installed EFVS sensors determined to be eligible for operational credit are located in the appendix of this report.

APPENDIX 1

EFVS SENSORS ELIGIBLE FOR OPERATIONAL CREDIT

This appendix contains individual reports on EFVS sensor installations eligible for operational credit. The Flight Technologies and Procedures Division with the support of the Aircraft Evaluation Division determined the eligibility of the EFVS. If an installed EFVS sensor is not included in this report, it is not eligible for operational credit (*Minimum Visibility for Use with EFVS*).

Principle operations inspectors (POI) using this document to authorize visual advantage operational credit must coordinate with the EFVS Focal Point in the Flight Technologies and Procedures Division during the operational evaluation for EFVS authorization (i.e., Operations Specification (OpSpec) C048, Enhanced Flight Vision System Operations).

EFVS Sensor:

Gulfstream G500 with installed Kollsman EVS-SP

The Flight Technologies and Procedures Division reviewed the data recorded during the G500 flight test program and has determined that the flight test data supports the statement of demonstrated performance published in the AFM.

Based on the demonstrated performance of the installed EVS-SP sensor, the Flight Technologies and Procedures Division finds the EVS-SP sensor is eligible for operational credit allowing the EFVS to account for no more than 33% of IAP visibility requirements without the use of the EFVS.

Gulfstream G280, G450, G550, G650 with installed Kollsman EVS-II

The EVS-II visual advantage was not evaluated by the Aircraft Certification Service and currently there are no statements of demonstrated visual advantage in the AFMs for these aircraft. The Flight Technologies and Procedures Division reviewed EFVS certification flight data, NASA test data, EASA flight test data, and sensor manufacturer data.

Based on the demonstrated performance of the installed EVS-II sensor, the Flight Technologies and Procedures Division finds the EVS-II sensor is eligible for operational credit allowing the EFVS to account for no more than 33% of IAP visibility requirements without the use of the EFVS.

Gulfstream Aircraft with installed Kollsman EVS-I

The EVS-I visual advantage was not evaluated by the Aircraft Certification Service and currently there are no statements of demonstrated visual advantage in the AFMs for these aircraft.

The Flight Technologies and Procedures Division reviewed sensor manufacturer data.

Based on the demonstrated performance of the EVS-I sensor, the Flight Technologies and Procedures Division finds the EVS-I sensor is eligible for operational credit allowing the EFVS to account for no more than 25% of IAP visibility requirements without the use of the EFVS.