

## NPRM 03-03 – Comments on Document

THALES Avionics has reviewed this NPRM with a team comprising Engineering and Certification specialists and submits the following comments to the Document Docket No. FAA-2003-14449, Notice No. 03-03.

### Visibility and Visual references

#### Relevant Text:

PART 1 Section 1.1 General definitions.

*Enhanced flight visibility means the average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent topographical objects may be clearly distinguished and identified by day or night by a pilot using an enhanced flight vision system.*

#### Comment #1:

The new wording about « *prominent topographical objects* » used both by day or night lets understand that previous unlighted and lighted objects are still included in such definition. Consequently to supplement the existing Approach Lights System (ALS) there are now new specific information coming from the Enhanced Flight Vision which participate to the comprehensive « *prominent topographical objects* ». This interpretation includes clearly the possibility that an electronic system may see some external objects (lighted or not without any difference) more easily than by natural vision, and now ALS are no longer the major support to make an approach by reduced visibility. However ALS still remain in the area of « *prominent topographical objects* » and will carry on to be used.

Considering this interpretation several questions arise.

#### Relevant Text:

PART 91 §91.175(1)(2)

*The pilot determines that the enhanced flight visibility observed by use of a certified enhanced flight vision system is not less than the visibility prescribed in the standard instrument approach procedure being used;*

#### Comment #2:

When the operator will look for the minimum RVR or VIS permission in his approach chart (through SIAP) which are the relevant minimums, those addressing ALS\_ON even if ALS is OFF ?

AC 120-29A §4.3.4.4 (b) *Specified Visual Reference* gives yet some credit to HUD synthetic symbology as supplemental information to external red lights. Tomorrow when a HUD + EFVS will be certified as an airborne equipment may be some other supplemental aids will be identified and criteria to establish practicable minima (i.e. *visibility prescribed*) will have to be defined.

#### Relevant Text:

PART 91 §91.175(1)(3)

*The following visual references for the intended runway are distinctly visible and identifiable to the pilot using the enhanced flight vision system: (i) The approach light system (if installed); or (ii) The runway threshold and the touchdown zone;*

#### Comment #3:

The visual references set proposed in this section is very reduced compared to the one of the existing § 91.175 (c) (3) and moreover runway threshold and the touchdown zone are not required to be get simultaneously in the current regulation.

What is the rationale to not keep the whole set of visual references proposed in the former and only elect this subset ? Why not to keep the current set and add new items ?

In fact the surprise comes essentially from the difference between operations conducted by the pilot when he (she) is searching for external cues. The same visible references have not the same significance whether the EFVS is ON or OFF, a misinterpretation could appear during this approach phase (with or without EFVS and even following an EFVS failure) and consequently the pilot training has also to be taken into consideration.

## Operations at 100ft and below

### Relevant Text:

PART 91 §91.175(1)(4)

*At 100 feet above the touchdown zone elevation of the runway of intended landing and below that altitude, the flight visibility must be sufficient for the following to be distinctly visible and identifiable to pilot without reliance on the enhanced flight vision system to continue to landing: (i) The lights or markings of the threshold; or (ii) The lights or markings of the touchdown zone;*

### Comment #4:

Concerning the list of visible references the previous remarks (see Comment #3) can be addressed. The wording *without reliance on EFVS* is ambiguous, the operational objective could be more clearly expressed. Certainly it exists a concern in this area of the final approach before landing and, the transition between external scene seen through EFVS and/or natural vision has to be addressed. However a new concern could appear : If enhanced flight visibility is used around MDA(H), DA(H) until 100ft and does not allowed below, the probability of missed approach at 100ft could increase, thus inducing a virtual displacement of the decision point from MDA(H), DA(H) toward 100ft [see also : PART 97 FO.8260.19.C4.S3 Section 3. Visual Descent Point (VDP)].

## HUD Symbology

### Relevant Text:

PART 91 §91.175(m) (2)

*The EFVS sensor imagery and aircraft flight symbology (i.e. at least airspeed, vertical speed, aircraft attitude, heading, altitude) are presented on a head-up display ...*

### Comment #5:

One of the major HUD symbology is omitted : Flight path vector

## Airworthiness aspects

### Relevant Text:

PART 91 §91.175(m) (1),(2),(3),(4),(5)

### Comment #6:

This section enumerates several features and characteristics the EFVS shall comply with. These characteristics are not quantified and remain rather fuzzy without any reference to a detailed MOPS or any technical standard. Does this section imply that if an EFVS system complies with all the characteristics of this NPRM, its certification will not need any further special condition demonstration ?

Sincerely,

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