

# **GUIDANCE AND INFORMATION ON APPLYING FOR AN EXEMPTION TO USE AN ENHANCED VISION SYSTEM/HEAD UP DISPLAY (EVS/HUD) TO DESCEND BELOW DH/MDH**



**Published by the Isle of Man Aircraft Registry, 2018**

**Ground Floor, Viscount House,  
Ronaldsway Airport,  
Ballasalla,  
Isle of Man,  
IM9 2AS,  
British Isles**

**Telephone: +44 (0)1624 682358 Fax: +44 (0)1624 682355**

**Email: [aircraft@gov.im](mailto:aircraft@gov.im)**

**Web: [www.iomaircraftregistry.com](http://www.iomaircraftregistry.com)**

**First edition November 2012**

**Second edition May 2013**

**Third edition August 2013**

**Fourth edition January 2016**

**Fifth edition September 2016**

**Sixth edition May 2017**

**Seventh edition July 2017**

**Eighth edition February 2018**

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## **REVISION HISTORY**

### **Edition 6    March 2017**

Reformatting and separation of the Declaration and Cross Reference Matrix into a Form.

### **Edition 7    July 2017**

Added text on page 4 to advise how copies of Appendixes can be requested.

### **Edition 8    February 2018**

Amended IOMAR postal address and website url on page 2.

## **1 GENERAL INFORMATION**

An enhanced vision system (EVS) is an electronic means to overlay an image of the forward surrounding topography on a head up display (HUD), allowing the pilot to see the surrounding terrain in low visibility conditions. Using an EVS, an aircraft may descend to 100 feet above the runway threshold elevation, based on the operational requirements outlined below and with an exemption from the Isle of Man Aircraft Registry. An exemption can only be granted for infrared systems that utilise a HUD as part of the EVS equipment. The infrared EVS performance can vary depending on the weather conditions encountered.

### **1.1 Acknowledgments**

Acknowledgments are made to the UK Civil Aviation Authority, Federal Aviation Administration and the European Aviation Safety Agency in the production of this Registry Publication.

### **1.2 Reference Documents**

EU-OPS 1.430 and Appendix 1(new) to OPS 1.430 (h)

JAA Administrative and Guidance Material Section Four: Operations, Part Three: Temporary Guidance Leaflet 44 (JAR-OPS) ACJ OPS to Appendix 1 (New) to JAR-OPS 1.430(h)

## **2 Application Process**

Operators wishing to use a certified EVS/HUD for descent below minima shall apply for an Exemption from the Isle of Man Aircraft Registry

### **2.1 Application Form**

[Form 44 - Application for an Exemption to descend below Minima using EVS/HUD](#), must be completed by the Operator or Flight Operations Representative (FOR) as recorded on the current Form 20.

### **2.2 Supporting Documentation**

The IOMAR requires the following supporting documentation to be submitted along with the completed Application Form: -

AFM or AFM Supplement showing evidence of EVS/HUD certification.

Flight Crew Training Completion Certificates for all crew who are currently EVS/HUD qualified and validated on the aircraft

Relevant extracts from the EVS/HUD Operations Manual.

## **3 Operational Requirements**

### **3.1 Certification**

The EVS must be certificated and used in accordance with the procedures and limitations of the Aircraft Flight Manual and shall include:

- (a) A head up display system capable of displaying airspeed, vertical speed, aircraft attitude, heading, altitude, command guidance as appropriate for the approach to be flown, path deviation indications, flight path vector, flight path angle reference cue and the EVS imagery;

- (b) For two pilot operation a head-down view of the EVS image or other means of displaying EVS-derived information easily to the pilot monitoring the approach;
- (c) If the aircraft is equipped with a radio altimeter, it will be used only as enhanced terrain awareness during approach using EVS and will not be taken into account for the operational procedures development.

### **3.2 Permitted Descent Using EVS**

An approach may descend below Decision Height (DH) (in the European Union referred to as Descent Altitude) or Minimum Descent Height (MDH) (in the European Union referred to as Minimum Descent Altitude) to 100 feet above the runway threshold elevation using EVS as outlined below. This is applicable for ILS, MLS, PAR, GLS and APV Operations with a DH no lower than 200 feet or an approach flown using approved vertical flight path guidance to a DH or MDH no lower than 250 feet. All approaches shall be flown as stabilised approaches and all non-precision approaches shall be flown using the continuous descent final approach technique.

### **3.3 EVS Displayed Visual References**

For continued descent below DH or MDH to 100 feet above runway threshold elevation one of the following visual references shall be displayed and identifiable on the EVS:

- (a) elements of the approach lighting; or
- (b1) the runway threshold, identified by at least one of the following:
  - (i) the beginning of the runway landing surface,
  - (ii) the threshold lights,
  - (iii) the threshold identification lights; **and**
- (b2) the touchdown zone, identified by at least one of the following:
  - (i) the runway touchdown zone landing surface,
  - (ii) the touchdown zone lights,
  - (iii) the touchdown zone markings or the runway lights.

### **3.4 Visual References For Descent Below 100 Feet Above Runway Threshold Elevation**

An approach may not continue below 100 feet above runway threshold elevation for the intended runway, unless at least one of the visual references specified below is distinctly visible and identifiable to the pilot without reliance on the enhanced vision system:

- (a) the lights or markings of the threshold; or
- (b) the lights or markings of the touchdown zone.

### 3.5 Reduction in Calculated RVR/CMV for the Approach Using EVS

RVR/CMV may be reduced using the following table when using EVS

<b>RVR/CMV normally required</b>	<b>RVR/CMV for approach using EVS</b> <i>Note: For operations in RVRs below 550 metres, two pilot operation is required</i>
550	350
600	400
650	450
700	450
750	500
800	550
900	600
1000	650
1100	750
1200	800
1300	900
1400	900
1500	1000
1600	1100
1700	1100
1800	1200
1900	1300
2000	1300
2100	1400
2200	1500
2300	1500
2400	1600
2500	1700
2600	1700
2700	1800
2800	1900
2900	1900
3000	2000
3100	2000
3200	2100
3300	2200
3400	2200
3500	2300
3600	2400
3700	2400
3800	2500
3900	2600
4000	2600
4100	2700
4200	2800
4300	2800
4400	2900
4500	3000
4600	3000
4700	3100
4800	3200
4900	3200
5000	3300

### 3.6 Aircraft Performance

Operators shall take into account any aircraft performance limitations associated with descent below DH or MDH e.g. missed approach procedures and terrain avoidance.

### **3.7 Crew Training**

Initial and recurrent training shall be provided to pilots in the use of EVS to descend below DH or MDH. The training shall reflect the complexity of the aircraft and the previous experience of the pilots but shall include aircraft system failures, engine failures, EVS failures and reversion to higher minima. A sufficient number of approaches shall be flown to assure a safe level of operation. Initial training shall include some element of line flying under supervision in the use of EVS to descend below DH or MDH. The flight crew training manual shall contain the syllabus for use of EVS in initial and recurrent training.

### **3.8 Operations Manual**

The Operations Manual shall contain all necessary instructions for the use of EVS in descent below DH or MDH.

### **3.9 Ongoing Compliance Monitoring**

A record must be made following each low visibility approach and landing by the pilot-in-command and provided to the operator for compliance monitoring and any remedial action if required whenever the EVS is used in descent below DH or MDH and for providing feedback in order to enhance the safety performance.

Unsuccessful approaches due to aircraft equipment failures must be reported to the operator immediately for remedial action.

The operator must collect and analyse the low visibility approach and landing records. Results of the analysis will be required by the Isle of Man Aircraft Registry as part of the EVS/HUD Exemption renewal application process.

Notes:

RP44 Appendix A – Monitoring Record Form provides an example of an All Weather Operations (AWOPS) monitoring form.

RP44 Appendix B – Monitoring Record Analysis Spreadsheet provides a tool for the analysis of AWOPS approach and landing records. The summary tab on the spreadsheet can be submitted to the Isle of Man Aircraft Registry as part of the exemption renewal application process.

To request copies of RP44 Appendix A and B, please email [flightoperations@gov.im](mailto:flightoperations@gov.im)

### **3.10 Planning**

Not all aerodromes will be suitable for the use of EVS. Runway lights using light emitting diodes do not give off an infra-red signature. The operator shall identify the hazards associated with EVS operation at each intended aerodrome of use and allow or prohibit EVS in descent below DH or MDH accordingly.