

of this part, and the requirements of that paragraph or section are not met at either of the following times:

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§91.176 Straight-in landing operations below DA/DH or MDA using an enhanced flight vision system (EFVS) under IFR.

(a) *EFVS operations to touchdown and rollout.* Unless otherwise authorized by the Administrator to use an MDA as a DA/DH with vertical navigation on an instrument approach procedure, or unless paragraph (d) of this section applies, no person may conduct an EFVS operation in an aircraft, except a military aircraft of the United States, at any airport below the authorized DA/DH to touchdown and rollout unless the minimums used for the particular approach procedure being flown include a DA or DH, and the following requirements are met:

(1) *Equipment.* (i) The aircraft must be equipped with an operable EFVS that meets the applicable airworthiness requirements. The EFVS must:

(A) Have an electronic means to provide a display of the forward external scene topography (the applicable natural or manmade features of a place or region especially in a way to show their relative positions and elevation) through the use of imaging sensors, including but not limited to forward-looking infrared, millimeter wave radiometry, millimeter wave radar, or low-light level image intensification.

(B) Present EFVS sensor imagery, aircraft flight information, and flight symbology on a head up display, or an equivalent display, so that the imagery, information and symbology are clearly visible to the pilot flying in his or her normal position with the line of vision looking forward along the flight path. Aircraft flight information and flight symbology must consist of at least airspeed, vertical speed, aircraft attitude, heading, altitude, height above ground level such as that provided by a radio altimeter or other device capable of providing equivalent performance, command guidance as appropriate for the approach to be flown, path deviation indications, flight path vector, and flight path angle reference cue. Additionally, for aircraft other

than rotorcraft, the EFVS must display flare prompt or flare guidance.

(C) Present the displayed EFVS sensor imagery, attitude symbology, flight path vector, and flight path angle reference cue, and other cues, which are referenced to the EFVS sensor imagery and external scene topography, so that they are aligned with, and scaled to, the external view.

(D) Display the flight path angle reference cue with a pitch scale. The flight path angle reference cue must be selectable by the pilot to the desired descent angle for the approach and be sufficient to monitor the vertical flight path of the aircraft.

(E) Display the EFVS sensor imagery, aircraft flight information, and flight symbology such that they do not adversely obscure the pilot's outside view or field of view through the cockpit window.

(F) Have display characteristics, dynamics, and cues that are suitable for manual control of the aircraft to touchdown in the touchdown zone of the runway of intended landing and during rollout.

(ii) When a minimum flightcrew of more than one pilot is required, the aircraft must be equipped with a display that provides the pilot monitoring with EFVS sensor imagery. Any symbology displayed may not adversely obscure the sensor imagery of the runway environment.

(2) *Operations.* (i) The pilot conducting the EFVS operation may not use circling minimums.

(ii) Each required pilot flightcrew member must have adequate knowledge of, and familiarity with, the aircraft, the EFVS, and the procedures to be used.

(iii) The aircraft must be equipped with, and the pilot flying must use, an operable EFVS that meets the equipment requirements of paragraph (a)(1) of this section.

(iv) When a minimum flightcrew of more than one pilot is required, the pilot monitoring must use the display specified in paragraph (a)(1)(ii) to monitor and assess the safe conduct of the approach, landing, and rollout.

(v) The aircraft must continuously be in a position from which a descent to a landing on the intended runway can be