



U.S. Department of Transportation
Federal Aviation Administration
Washington, DC

Operational Suitability Report (OSR)

Revision: Original
Date: XX/XX/XXXX

Airbus Helicopters, Inc. Category A Vertical Takeoff and Landing (VTOL) with Integrated Camera

Approved by The Aircraft Evaluation Division (AED)
Flight Standardization Board (FSB)
Federal Aviation Administration (FAA)

Flight Standards Mail Stop 3
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington DC, 20591

Office Email: 9-AVS-AFS-100@faa.gov

RECORD OF REVISIONS

Revision Number	Sections	Date	Administrator
0 (Original)	All	XX/XX/XXXX	J. McCoy

HIGHLIGHTS OF CHANGE

0. Original Document; all Sections.

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1. PURPOSE.

- 1.1 This Operational Suitability Report (OSR) specifies training, checking, and differences requirements applicable to flightcrew members operating Airbus Helicopters Inc., Models MBB BK-117 D-2/D-3 with Sekai Multi-Purpose Camera 850-0000225-000_1 (84) package installed via SB MBB-BK117-23-75-0002 and Flight Management Computing – VTOL crosshair activation in accordance with SB MBB-BK117-34-63-0002 here after referenced as VTOL Camera System. This report provides guidance to Title 14 of the Code of Federal Regulations (14 CFR) parts 91, 135, 141, and 142 operators and other training providers.
- 1.2 The AED, Rotorcraft Branch conducted an Operational Suitability Evaluation of the Airbus BK-117 D-3 aircraft with the VTOL Camera System installed. This activity was conducted at the Grand Prairie Airport (KGPM) in Grand Prairie, TX on August 13, 2024. The aircraft utilized for this demonstration was the N145AH (Serial No. 21099), MBB-BK117 D-3. The aircraft has the VTOL Camera System that is mounted on the lower forward side of the fenestron and displays an image of the landing area under the aircraft. The purpose of the camera and the projected image is to allow the pilot to see when the aircraft is positioned over the landing surface during a vertical descent to landing. The pilot is not able to see the landing surface directly below the aircraft due to the fuselage restricting the visibility straight down. The evaluation reviewed operating characteristics and techniques to propose training, checking, and differences requirements applicable to the aircraft and configuration.
- 1.3 In conducting this evaluation, the AED, Rotorcraft Branch utilized factors that are considered the most likely scenario for operators of the MBB-BK-117 D-2 and D-3. The evaluating pilots had previous experience in a Helionix flat panel (all-glass) aircraft. Differences training was provided by the Rotorcraft Flight Manual Supplement (RFMS) and Airbus Helicopters company instructor for the CAT A VTOL system and profiles.

2. APPLICABILITY.

- 2.1 In accordance with 14 CFR, the provisions of this report apply to all Category A VTOL operations of Airbus Helicopter MBB-BK-117 D-2/D-3 with the VTOL Camera System installed. This report is also applicable to all training and checking conducted in the aircraft. This report is effective until amended, superseded, or withdrawn by subsequent revision.
- 2.2 The training requirements in this report apply to aviation safety inspectors (ASI) (Operations), Principal Operations Inspectors (POI), Training Center Program Managers (TCPM), Aircrew Program Managers (APM), 14 CFR part 135 air carrier check airmen and instructors, airline transport pilots (ATP) instructing in air transportation service, certificated flight instructors (CFI), Aircrew Program Designees (APD), and Training Center Evaluators (TCE).

3. DESCRIPTION.

- 3.1 The aircraft has the VTOL Camera System mounted on the lower forward side of the fenestron and displays an image of the landing area under the aircraft on the Number 4 Multifunction Display (MFD 4) when selected. The purpose of the camera and the projected image is to allow the pilot to see when the aircraft is positioned over the landing surface to prepare for a vertical descent to landing from an altitude that is clear of obstacles. The pilot is not able to see the landing surface directly below the aircraft due to the fuselage restricting the visibility straight down. The image incorporates a cross hair target reticle which allows the pilot to see the aircrafts position relative to the landing area when positioned withing the field of vision of the camera. The target reticle is adjusted by the aircraft management computer through algorithms to compensate for altitude and aircraft attitude. The pilot selects the appropriate camera view (there may be multiple camera installations for various views) on the MFD 4.
- 3.2 All Category A operations require a functioning Radar Altimeter and Autopilot Basic Stabilization. The VTOL procedure requires, in addition, the Ground Trajectory Control (GTC) and Ground Trajectory Control Hover (GTC.H) modes of the autopilot to be functional along with the camera to display the appropriate image on MFD 4. For night operations the appropriate search and landing light is also required.
- 3.3 If any of the required equipment becomes inoperative prior to reaching the landing decision point (LDP) the approach must be aborted.
- 3.4 Use of the automation is the normal procedure; however, hand-flown approaches are possible utilizing this system should there be a failure after the LDP.
- 3.5 The pilot maneuvers the aircraft over the landing zone (LZ) and into a hover assisted by the camera image. The pilot monitors the LZ during the approach through the displayed image on the MFD 4 providing visibility directly below the aircraft not normally visible from the pilot station.
- 3.6 For the vertical takeoff the pilot can monitor the position of the aircraft utilizing the camera image enhancing the situational awareness.

4. PROCEDURES FOR CATEGORY A VERTICAL TAKEOFF AND LANDING.

When required by 14 CFR, operators must develop normal, abnormal, and emergency operating procedures from Flight Manual Supplement 9-1.1 and the Flight Manual Appendices (FMA) 11-82. These procedures must be included in the appropriate approved operator training course.

5. OPERATIONAL SUITABILITY.

The AED Rotorcraft Branch found the VTOL Camera System to be operationally suitable for 14 CFR parts 91 and 135 operations.

6. SPECIFICATION FOR TRAINING AND CHECKING.

- 6.1 The pilot in training must already be familiar with the aircraft and other installed systems and equipment. Training for the VTOL procedures shall emphasize:
- a) Limitations associated with required equipment for each procedure.
 - b) Limitations on minimum heliport dimensions.
 - c) Performance charts for VTOL procedures.
 - d) Procedures for configuring aircraft prior to takeoff and approach to landing.
 - e) Verification of appropriate Upper Mode selected.
 - f) Procedures for dealing with an one-engine-inoperative (OEI) condition before and after reaching takeoff decision point (TDP) on departure.
 - g) Procedures for dealing with an OEI condition before and after reaching LDP on approach.
 - h) Demonstration of automated and hand flown procedures.
 - i) Appropriate procedure for loss of system components in each phase of flight.

Note: System training should be accomplished in a full flight simulator (FFS) or on the actual systems installed on the aircraft.

- 6.2 Based on the evaluation, the AED, Rotorcraft Branch recommends that differences training with the VTOL Camera System installed as Level D or E training on the following:

- a) Limitations associated with required equipment for each procedure.
- b) Limitations on minimum heliport dimensions.
- c) Performance charts for VTOL procedures.
- d) Procedures for configuring aircraft prior to takeoff and approach to landing.
- e) Verification of appropriate Upper Mode selected.
- f) Procedures for dealing with an OEI condition before and after reaching TDP on departure.
- g) Procedures for dealing with an OEI condition before and after reaching LDP on approach.
- h) Demonstration of automated and hand flown procedures.
- i) Appropriate procedure for loss of system components in each phase of flight.

Training Differences Legend

Differences Level	Type	Training Method Examples	Conditions
A	Self-Instruction	• Operating manual revision (handout (HO)) • Flight crew operating bulletin (HO)	• Crew has already demonstrated understanding on base aircraft (e.g., updated version of engine). • Minor or no procedural changes required. • No safety impact if information is not reviewed or is forgotten (e.g., different engine vibration damping mount). • Once called to attention of crew, the difference is self-evident.
B	Aided Instruction	• Audiovisual presentation (AV) • Tutorial computer-based instruction (TCBI) • Stand-up instruction (SU)	• Systems are functionally similar. • Crew understanding required. • Issues need emphasis. • Standard methods of presentation required.
C	Systems Devices	• Interactive (full-task) computer-based instruction (ICBI) • Cockpit Procedures Trainers (CPT) • Part task trainers (PTT) • Level 4 or 5 flight training device (FTD 4-5)	• Training can only be accomplished through systems training devices. • Training objectives focus on mastering individual systems, procedures, or tasks versus highly integrated flight operations or “real-time” operations. • Training devices are required to assure attainment or retention of crew skills to accomplish more complex tasks usually related to aircraft systems.
D	Maneuvers Devices	• Level 6 or 7 flight training device (FTD 6-7) • Level A or B full flight simulator (FFS A-B)	• Training can only be accomplished in flight maneuver devices in a real-time environment. • Training requires mastery of interrelated skills versus individual skills. • Motion, visual, control-loading, and specific environmental conditions may be required.
E	Level C/D FFS or Aircraft	• Level C or D full flight simulator (FFS C-D) • Aircraft (ACFT)	• Motion, visual, control-loading, audio, and specific environmental conditions are required. • Significant full-task differences that require a high-fidelity environment. • Usually correlates with significant differences in handling qualities.

6.3 Based on the evaluation, the AED, Rotorcraft Branch recommends that differences checking with Seika Camera System and VTOL procedures installed as Level D or E checking.

Checking Differences Legend

Differences Level	Checking Method Examples	Conditions
A	None	None
B	• Oral or written exam • Tutorial computer-based instruction (TCBI) self-test	Individual systems or related groups of systems.
C	• Interactive (full-task) computer-based instruction (ICBI) • Cockpit Procedures Trainers (CPT) • Part task trainers (PTT) • Level 4 or 5 flight training device (FTD 4-5)	• Checking can only be accomplished using systems devices. • Checking objectives focus on mastering individual systems, procedures, or tasks.
D	• Level 6 or 7 flight training device (FTD 6-7) • Level A or B full flight simulator (FFS A-B)	• Checking can only be accomplished in flight maneuver devices in a real-time environment. • Checking requires mastery of interrelated skills versus individual skills. • Motion, visual, control-loading, and specific environmental conditions may be required.
E	• Level C or D full flight simulator (FFS C-D) • Aircraft (ACFT)	Significant full-task differences that require a high-fidelity environment.

6.4 POIs may contact the AED, Rotorcraft Branch for technical assistance in evaluating training and checking for individual operators that have unique issues not addressed in this report or with any other questions or concerns.