Single Engine IFR Certification

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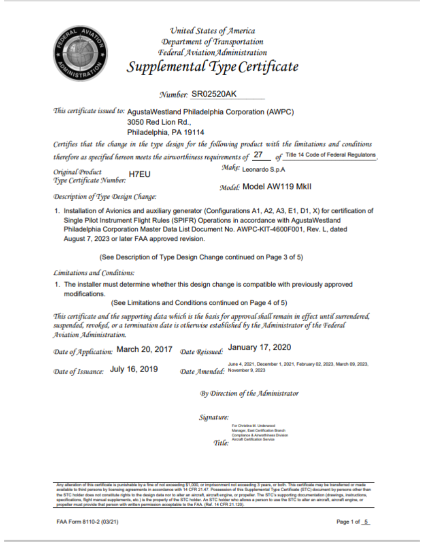
EASA

EASA Rotorcraft Symposium
Cologne, 2025

Single Engine IFR (FAA) certified products.

AW119 MKII


United States of America
Department of Transportation
Federal Aviation Administration
Supplemental Type Certificate

Number: SR02520AK

This certificate issued to: AgustaWestland Philadelphia Corporation (AWPC)
3050 Red Lion Rd.,
Philadelphia, PA 19114

Certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of 27 of Title 14 Code of Federal Regulatons.

Original Product Type Certificate Number: H7EU
Make: Leonardo S.p.A
Model: Model AW119 MkII

Description of Type Design Change:

1. Installation of Avionics and auxiliary generator (Configurations A1, A2, A3, E1, D1, X) for certification of Single Pilot Instrument Flight Rules (SPIFR) Operations in accordance with AgustaWestland Philadelphia Corporation Master Data List Document No. AWPC-KIT-4600F001, Rev. L, dated August 7, 2023 or later FAA approved revision.

(See Description of Type Design Change continued on Page 3 of 5)

Limitations and Conditions:

1. The installer must determine whether this design change is compatible with previously approved modifications.

(See Limitations and Conditions continued on Page 4 of 5)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of Application: March 20, 2017
Date Reissued: January 17, 2020
Date of Issuance: July 16, 2019
Date Amended: June 4, 2021, December 1, 2021, February 02, 2023, March 09, 2023, November 9, 2023

By Direction of the Administrator

Signature:

Title: For Christina M. Underwood
Manager, East Certification Branch
Compliance & Airworthiness Division
Aircraft Certification Service

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).

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FAA STC SR02520AK
issued on July 16, 2019

Single Engine IFR (FAA) certified products.

BELL 407GXi

(Rolls Royce 250-C47E/4 plus Garmin G1000H Nxi)

United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

Number: SR1241DS

This certificate issued to: Bell Helicopter Textron Inc.
P.O. Box 482
Fort Worth, TX 76101

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part 27 of the Federal Aviation Regulations.

Original Product – Type Certificate Number: H2SW

Make: Bell Helicopter Textron Canada Limited
Model: 407

Description of Type Design Change:

Installation of Single Pilot Instrument Flight Rules (SPIFR) configuration in accordance with Master Drawing List 407-905-116 Revision -, dated July 26, 2019 or later FAA approved revision. Rotorcraft Flight Manual Supplement (BHT-407-FMS-41.3 Revision Basic, dated August 14, 2019 or later FAA approved revision) is required. Instruction for Continued Airworthiness (BHT-407-MM, Issue 005, dated August 14, 2019 or later FAA accepted revision) is required.

Limitations and Conditions:

This STC is eligible for installation on Model 407 rotorcraft serial numbers 54567 and 54805 through 56999.
The 407-706-067-101 3-axis AFCS kit and 407-706-004-105 28Allr SLA Battery kit must be installed.

Limitations and Conditions continued on Page 3.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, and revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: 8/29/2018
Date issuance: 8/15/2019

Date reissued:
Date amended:

By direction of the Administrator

Signature: _____
Title: John T. Bourne, ODA Lead administrator
BHTI ODA-710621-SW

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).

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FAA STC SR11241DS

issued on Aug 15, 2019

Single Engine IFR (FAA) certified products.

AS350B3e (H125)

United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

Number: SR02591AK

This certificate issued to: Genesys Aerosystems, Inc.
4001 Old International Airport Road, Unit #10
Anchorage, AK 99502

Certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part 23 of Federal Aviation Regulation.

Original Product — *Make:* Airbus Helicopters
Type Certificate Number: H9EU — *Model:* AS350B3

Description of Type Design Change:
Installation of Electronic Flight Information System (EFIS), avionics, and stability augmentation system/autonatic flight control system for certification of Single Pilot Instrument Flight Rules (SPIFR) operations in accordance with Genesys Aerosystems, Inc., Master Data List (MDL), AS350B3 (H125) Avionics Upgrade for Instrument Flight Rules (IFR), Document Number 17-125002, Revision A, dated February 20, 2025, or later FAA approved revisions.

Limitations and Conditions:
1. Compatibility of the design change with previously approved modifications must be determined by the installer.

(Limitations and Conditions continued on Page 3 of 4)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: December 28, 2022 — *Date reissued:*
Date of issuance: February 27, 2025 — *Date amended:*
By direction of the Administrator
Digitally signed by AUGUST A ASAY
Date: 2025.02.28 20:41:22 -09'00'
Signature:
for Gregory J. DiCicero
Title: Manager, Vivin Certification Branch

FAA Form 8110-2 (06/20) SUPERSEDES PREVIOUS EDITION — PAGE 1 OF 4

FAA STC SR02591AK
issued on Feb 27, 2025

Design Change classification & Cert. Basis definition

→ According to 21.A.101
VFR to IFR upgrade is **SIGNIFICANT**, typically but not limited to:

- ❑ Avionics Installation suite
- ❑ SAS / AFCS
- ❑ Kind of operations (IFR)
- ❑ Failure assessments

Table A-8. Examples of Significant Changes for Rotorcraft (CS-27 and CS-29)

Example	Description of change	Is there a change to the general configuration?	Is there a change to the principles of construction?	Have the assumptions used for certification been invalidated?	Notes
15.	IFR upgrades involving installation of upgraded components for new IFR configuration.	No	No	Yes	Changes to architecture concepts, design philosophies, human-machine interface, or flight-crew workload.

→ Airworthiness Standards are not precluding IFR certification to a Single Engine helicopter (no need for special conditions), provided that:

- ❑ Substantiation of the new installations
- ❑ Showing of compliance with new requirements (typically CS-27 Appendix B)
- ❑ Re-assessing the validity of all previous evidences, where affected.

Master CRI-0000530

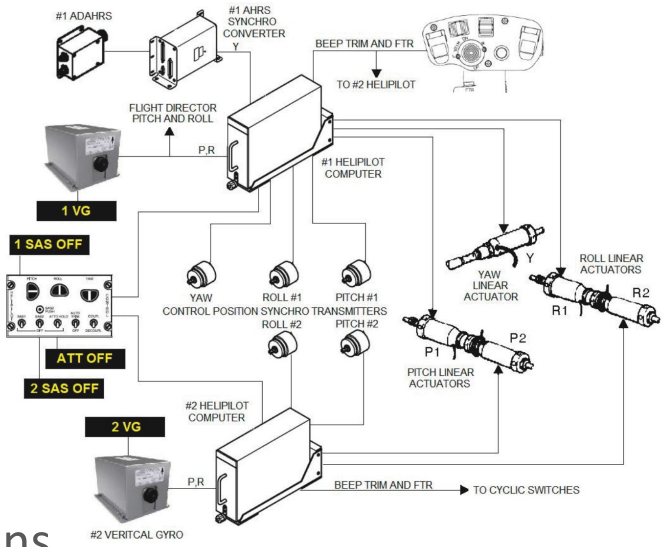
- CRI IM/MoC drafted to provide additional Interpretative Material/Means of Compliance and to clarify the expected minimum design features and certification approach.
- Clearly identify the **minimum baseline configuration** for IFR certification to comply with Appendix B requirements and in particular with paragraph VIII(b)(5)(iii).

> (5) For systems that operate the required flight instruments at each pilot's station:
>
> (iii) The equipment, systems, and installations must be designed so that one display of the **information essential to the safety of flight** which is provided by the instruments will **remain available to a pilot**, **without additional crewmember action**, after any single failure or combination of failures that is not shown to be **extremely improbable**;

- Re-assessment of all the compliance evidence applicable to the basic aircraft and optional equipment in light of the new intended use.

Master CRI-0000530

→ AFCS failures and malfunctions.



According to CS-27 App. B.VII (a)(1), AFCS failures need to be completely reviewed and re-substantiated, considering:

- ❑ Severity commensurate to IFR operations in the most critical conditions
- ❑ Pilot recognition and response times laid down in AC 27 App. B §b.(6)(iii)(C)

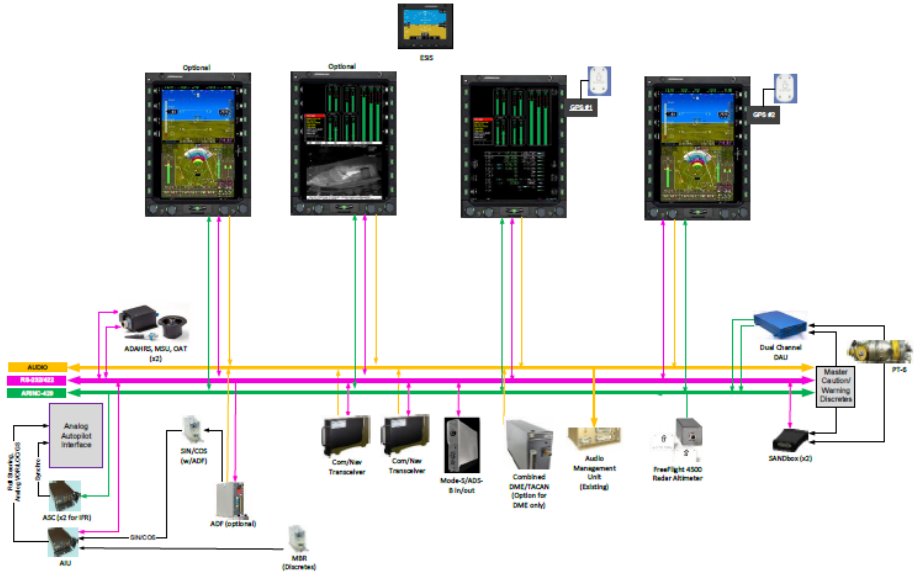
and for malfunctions not shown to be extremely improbable, it has to be shown by means of flight tests and/or simulations that:

- ❑ the helicopter is safely controllable when the failure occurs and, after the failure recovery:
- ❑ the helicopter flight characteristics allow for prolonged IFR flight without undue pilot effort, and
- ❑ within a practical flight envelope, HQ are not degraded below VFR levels

Master CRI-0000530

→ 27.1309

Some equipment, systems or installations (e.g. FMS, VOR and LOC/GS receivers, DME), although already installed for VFR, will have a different **intended function** as per CS 27.1301 when used in IFR flights.



Regardless of a change in the intended functions,
all functional failures must be re-assessed and eventually re-substantiated for the **typical flight phases and conditions of IFR operations**.

Master CRI-0000530

→ **HMI cockpit evaluation vs. 27.1302.**

→ **Minimum flight crew evaluation**

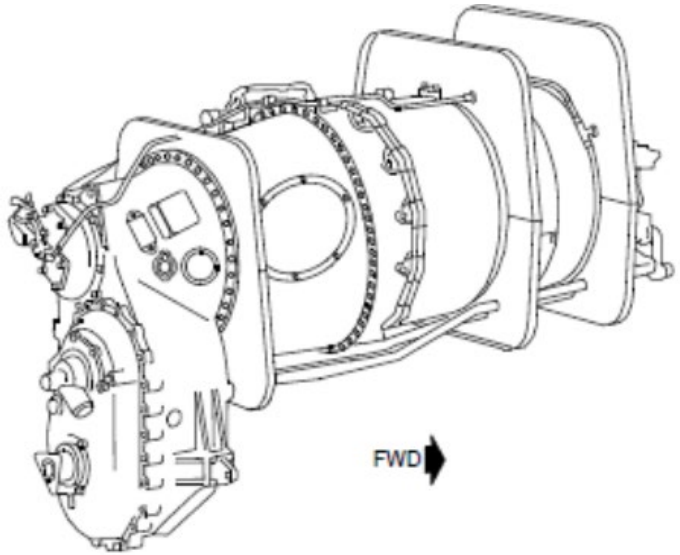
IFR operations must be conducted by the crew member(s) without unreasonable fatigue or strength.

The crew workload assessment must also cover scenarios resulting from any failure condition not extremely improbable and the associated emergency procedure and consequently degraded configuration.

Master CRI-0000530

→ **Engine failure.**

In case of engine failure, the aircraft should be able to enter autorotation, to conduct an emergency descent, and to land on a suitable site in the most critical scenario.



Due to the large reduction in functional capability and safety margins, and due to the excessive workload or physical distress, any system failure condition resulting in **loss of engine power** is expected to be classified **at least hazardous.**

Master CRI-0000530

Functions incorporated into the **engine control system** that make it part of any equipment, system or installation which may also contribute to loss of engine power are not exempted from the rotorcraft safety assessment.

However, given that:

- → The engine itself, as a certified product under CS-E, is assumed to be eligible for both VFR and IFR operations.
- → The provisions for specifically oriented training to Loss Of Power in IMC are implemented through OSD

EASA finds acceptable to re-assess the quantitative objective for

Loss Of Power (Airframe Systems + Engine Control System) < 10^{-5}/FH

Master CRI-0000530

→ **OSD MMEL & FCD**

The applicant is expected to evaluate and define the impact of the IFR certification on OSD data, considering among others the element of **autorotation in degraded environment conditions down to zero visibility** during all phases of flight applicable to the type certified IFR category.

→ **… and don't forget CS-ACNS when seeking operational approval.**

OPS & CONOPS

- Kinds of operations performed by grandfathered certified aircraft (e.g. Bell 206L, Kaman K-1200) are **unknown** to EASA.
- Industry / Operators are silent about the intended operational framework.
- Impacts on **AIR OPERATIONS** and **AIRCREW** regulations have not been quantified.
- EASA vs. NAAs
  In our certification assumptions, **operational limitations and restrictions** that would be required for the operational approval of such operations are **deferred to the competent authority**.
- The idea is not to lower the operational standards by replacing multi-engine rotorcraft with single engine, but to fill **specific needs**.

Potential advantages of SE IFR rotorcraft

Reduce cost for IFR Training

IFR-rated pilots have access to professional opportunities in commercial air transport

More IFR-rated pilots

Consolidated habit to fly on instruments can lead to more effective recovery from IIMC

Reduced environmental impact

In line with the objectives on reduction of aviation carbon footprint

Opening to new operational scenarios

Paving the way for the aviation of the future (hybrid concepts, UAM…)

Thank you
for your attention!

Your safety is our mission.

EASA
European Union Aviation Safety Agency

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