

Special Condition SC-OLSA-div-01 Night VFR Operation for LSA

Introductory Note:

The hereby presented Special condition has been classified as an important Special Condition and as such has been subjected to public consultation, in accordance with EASA Management Board Decision 12/2007 dated 11 September 2007, Article 3 (2.), which states:

"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."

Statement of Issue:

The applicability of CS-LSA is limited to VFR-day operation only. This Special Condition establishes additional requirements in order to enhance the scope of operation to VFR-night in accordance with 21.A.16B.

Justification:

Increasing the CS-LSA applicability will provide more flexibility for LSA design and operational possibilities. This is in line with the current technical developments of LSA. The number of aeroplanes in the CS-LSA category will increase. This option will have a positive economic effect for LSA manufacturer.

The increase of the applicability to VFR-night has been already done with no negative safety record in the CS-VLA category. Furthermore, VFR night operation is already allowed for the US-LSA category.

Considering the similarity of CS-LSA with CS-VLA, for this certification activity, the SC-OVLA-div-01 (Night VFR for VLA) is taken as reference and adequately adapted to define the corresponding requirement for LSA category. In addition, night VFR requirements included in the ASTM F2245-12d are considered and adopted when practical.

Special condition:

Considering all the above, the following Special condition is adopted:

SPECIAL CONDITION

SC-OLSA-div-01 - Night VFR operation for LSA – Is.1

Subpart A - General

SC LSA.5:

In addition to CS-LSA.5:

For Night VFR, compliance with this Special Condition shall be demonstrated.

Subpart B - Standard Specification for Design and Performance of a Light Sport Aeroplane

SC LSA.15-1.2:

In addition to CS-LSA.15-1.2

This Special Condition is applicable to aeroplanes intended for 'non-aerobatic' and for VFR operation only.

SC LSA.15-6.10.1:

In addition to the requirements of CS-LSA.15-6.10.1 the following applies:

The pilot compartment must be free from internal and external glare and reflections that could interfere with the pilot's vision in all operations for which the certification is requested.

Ability to conduct an emergency escape shall be ensured in night conditions.

SC LSA.15-7.2:

In addition to CS-LSA.15-7.2, the following applies:

For Night VFR operation, the engine must meet the specifications of CS-E or equivalent and the propeller and its control system must meet the specification of CS-P or equivalent except for fixed pitch propellers, for which CS-22 Subpart J is sufficient.

In addition:

7.2.3 If an air filter is used to protect the engine against foreign material particles in the induction air supply -

- (a) Each air filter must be capable of withstanding the effects of temperature extremes, rain, fuel, oil, and solvents to which it is expected to be exposed in service and maintenance; and
- (b) Each air filter must have a design feature to prevent material separated from the filter media from re-entering the induction system and interfering with proper fuel metering operation.

7.2.4 Each power or thrust control must be designed so that if the control separates at the engine fuel metering device, the aeroplane is capable of continuing safe flight and landing.

7.2.5 Each manual engine mixture control must be designed so that, if the control separates at the engine fuel metering device, the aeroplane is capable of continuing safe flight and landing

SC LSA.15-8.2:

In addition to CS-LSA.15-8.2:

8.2.3 A magnetic direction indicator compliant with CS-VLA.1327

8.2.4 One attitude indicator

8.2.5 For night VFR operation there must be at least two independent sources of power and a manual or an automatic means to select each power source for each instrument that uses a power source.

8.2.6 Instruments lights as specified in Annex A2.7.1 of ASTM F2245-12d

8.2.7 External lights as specified in Annex A2.7.2 – A2.7.4 of ASTM F2245-12d.

SC LSA.15 - 8.4

In addition to CS-LSA.15-8.4:

8.4.5 *Electrical System*

8.4.5.1 The electrical system shall comply with sections A2.9.1 to A2.9.4 of Annex A2.9 of ASTM F2245-12d for Night VFR operation.

8.4.5.2 Electric power sources must function properly when connected in combination or independently.

8.4.5.3 No failure or malfunction of any electric power source may impair the ability of any remaining source to supply load circuits essential for safe operation.

8.4.5.4 In the event of a complete loss of the primary electrical power generating system, the battery must be capable of providing 30 minutes of electrical power to those loads that are essential to continued safe flight and landing. The 30-minute time period includes the time needed for the pilot(s) to recognise the loss of generated power and to take appropriate load shedding action

SC LSA.15-8.6.2.6:

In addition to CS-LSA.15.8.6:

8.6.2.6: For night operation the equipment, systems, and installations must be designed to minimise hazards to the aeroplane in the event of a probable malfunction or failure.

SC LSA.15-8.7:

In addition to CS-LSA.15-8:

8.7 Instruments installation: Each flight, navigation and powerplant instrument must be clearly arranged and plainly visible to each pilot.

SC LSA.15-8.8:

In addition to CS-LSA.15-8:

8.8 If warning, caution, or advisory lights are installed in the cockpit, they must comply with CS-VLA 1322 and be effective under all probable cockpit lighting conditions.

SC VLA.15-8.9:

In addition to CS-LSA.15-8:

8.9 *Airspeed Indicating System* - For night VFR operation the aircraft airspeed indicating system must comply with CS-VLA.1323

SC VLA.15-8.10:

In addition to CS-LSA.15-8:

8.10 *Static Pressure System*

8.10.1 For night VFR operation the static pressure system must comply with CS-VLA.1325

8.10.2 Each static pressure system must be calibrated in flight to determine the system error. The system error, in indicated pressure altitude, at sea-level, with a standard atmosphere, excluding instrument calibration error, may not exceed ± 9 m (± 30 ft) per 185 km/h (100 knot) speed for the appropriate configuration in the speed range between $1.3 V_{SO}$ with flaps extended and $1.8 V_{S1}$ with flaps retracted. However, the error need not be less than ± 9 m (± 30 ft).

SC LSA.15-9.1.7:

In addition to CS-LSA.15-9.1:

9.1.7 For night VFR operation CS-VLA 1547 must be complied with. In addition if a magnetic non-stabilised direction indicator can have a deviation of more than 10° caused by the operation of electrical equipment, the placard must state which electrical loads, or combination of loads, would cause a deviation of more than 10° when turned on.

SUBPART G – Operating Limitations and Information

SC LSA.25:

In addition to CS-LSA.25:

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| Add | 6.6.13 The kinds of operation (Day-VFR or Day- and Night-VFR, whichever is applicable) in which the aeroplane may be used. A list of the minimum equipment required for the operation. |
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SUBPART H - Engine and Electric Propulsion Units (EPU)

SC LSA.35:

In addition to CS-LSA.35:

For Night VFR operation, the engine must meet the specifications of CS-E or equivalent

SUBPART J - Propeller

SC LSA.40:

In addition to CS-LSA.40:

For Night VFR operation, the propeller and its control system must meet the specification of CS-P or equivalent except for fixed pitch propellers, for which CS-22 Subpart J is sufficient.

ANNEX

Appendix 1

Acceptable Means of Compliance to SC-OLSA.div-01

I. AMC SC LSA.15-7.2.4:

When throttle linkage separation occurs, the fuel control should go to a setting that will allow the pilot to maintain level flight in the cruise configuration.

II. AMC SC LSA.15-7.2.5:

When mixture linkage separation occurs, the mixture control should go to a full rich setting.

III. AMC SC LSA.15-8.6.2.6:

For night VFR operations, the installations of complex systems may require an assessment as required by CS 23.1309 (b). This means that:

- (1) A Functional Hazard Assessment (AC 23.1309 can be used as guidance) should be conducted to assess the effect of a failure or combination of system failures at aircraft level.
- (2) Essential instruments/functions for the type of operation should be identified.
- (3) If applicable, HIRF should be considered as possible failure condition.
- (4) Adequate equipment qualification should be demonstrated (this may include also software, airborne electronic hardware and environmental aspects).

IV. AMC SC LSA 15-8.7:

For night VFR operations, the following arrangement of instruments is acceptable:

(a) For each aeroplane the flight instruments required by CS-LSA.15- 8.2 and SC LSA.15-8.2, as applicable, by the Operating Rules should be grouped on the instrument panel and centred as nearly as practicable about the vertical plane of the pilot's forward vision. In addition –

- (1) The instrument that most effectively indicates the attitude should be on the panel in the top centre position;
- (2) The instrument that most effectively indicates airspeed should be adjacent to and directly to the left of the instrument in the top centre position;
- (3) The instrument that most effectively indicates altitude should be adjacent to and directly to the right of the instrument in the top centre position; and
- (4) The instrument that most effectively indicates direction of flight, other than the magnetic direction indicator required by CS-LSA.15-8.2.3, should be adjacent to and directly below the instrument in the top centre position.

(b) If a visual indicator is provided to indicate malfunction of an instrument, it should be effective under all probable cockpit lighting condition.