



**Means of Compliance
with
Light-UAS.2615**

Doc. No. : MOC Light-UAS.2615-01

Issue : 1

Date : 11 August 2023

Proposed Final

Deadline for comments: 11 SEP 2023

SUBJECT : **Flight, navigation, and thrust/lift/power system instruments**

REQUIREMENTS incl. Amdt. : Special condition Light-UAS Medium Risk 01,
point Light-UAS.2615

ASSOCIATED IM/MoC : Yes / No

ADVISORY MATERIAL : N/A

Introductory Note

EASA is establishing means of compliance for Special Condition Light-UAS (SC Light-UAS) Medium Risk (SAIL III and IV). The research project Shepherd analysed available standards and recommended the selection of some sections of ASTM F3298 to substantiate full compliance with Light UAS 2615.

EASA has largely endorsed this assessment while complementing it with additional elements as presented by this document.

The means of compliance herein presented are expected to be demonstrated within the frame of SAIL IV DVR. They can be utilized also for SAIL III. Applicability for SAIL V and VI will be assessed separately.

List of acronyms

AFCS: automatic flight control system

CMU: control and monitoring unit

DVR: design verification report

FH: Flight Hours

LUAS: Light UAS

MoC: Means of Compliance

RP: remote pilot

1. SC Light-UAS.2615

Installed systems must provide the remote crew member, who sets or monitors parameters for the flight, navigation, and lift/thrust/power system, the information necessary to do so during each phase of flight. This information must:

- (a) be presented in a manner that the crew members can monitor the parameters and trends, as needed to operate the UA; and
- (b) include limitations, unless the limitation cannot be exceeded in all intended operations

2. Means of Compliance with Special Condition Light-UAS.2615

The term "crew member" is utilized by Light-UAS.2615 to indicate any personnel involved in essential tasks and directly interacting with the CMU (the UAS, subject to DVR, is constituted by the UA and the CMU operating it). The applicant for DVR may utilize this MoC also with regard to the tasks of these crew members. The tasks of crew members not directly interacting with the CMU are not considered in the scope of DVR, or TC. F3298-19 utilizes mostly the term "remote pilot" and, for clarity and considering the above, this MoC endorses the use of this term instead of crew member.

SC Light-UAS.2615 establishes that all relevant information needs to be presented to the RP so that the RP can safely operate the UA. It does not cover controls or other means actuated by the RP to exercise active control on the UA.

This MoC aims at identifying typical information and parameters that should be presented to the RP, unless otherwise justified by the applicant considering the specific UAS, operational characteristics and limitations.¹

The following sections of *ASTM standard F3298-19 "Standard Specification for Design, Construction, and Verification of Lightweight Unmanned Aircraft Systems"* address different types of instruments and related provided information. Each section/ subsection has been individually assessed as partially covering SC Light-UAS.2615 requirements.

Demonstration of all listed sections would establish compliance with SC Light-UAS.2615.

In a few cases, sections address both the information presented to, and the controls utilized by, the RP. It is responsibility of the applicant to distinguish the two aspects, when they are both present in a section, and utilize the first to cover Light UAS 2615.

Applicable sections of ASTM standard F3298-19:

7.6	airspeed limitations
7.9.6.1	safe monitoring of propulsion system
7.9.6.3	fuel quantity / state of charge
7.11.4	required equipment / on-board subsystems (fixed wing UA)
10.2	flight and navigation instruments
10.3.2	AFCS indication

¹ Criteria to temporarily hide information and parameters from full-time display may be found in JARUS GM-UAS.2615. They are not part of this MoC however they could be discussed with EASA where considered appropriate.

- 10.5.7.1 monitored propulsion parameters
- 10.5.7.2 residual battery capacity
- 10.5.7.3 battery health information
 - specific battery health monitoring information to be made available in the CMU should be defined in the frame of compliance to LUAS 2410
- 10.6.3.1 lost link information
- 10.6.5 position of the UA during lost link procedures
- 12.2.4.3 only applicable when data recorder is included in the verified UAS configuration
- 16.5.1 flight and navigation instruments
- 16.5.2.2 AFCS Indications

A2. ADDITIONAL REQUIREMENTS FOR UAS INTENDED FOR EXPANDED OPERATIONS:

- A2.4.1.1 General
- A2.4.1.2 Flight and Navigation Instruments
- A2.4.1.3 Propulsion Instruments
- A2.4.1.4 Warning and Alerts
- A2.4.1.5 Multiple Control Stations or Aircraft
- A2.4.1.6 Miscellaneous

The applicant should consider Section 15.5 and apply it with regard to the functions addressed by SC Light-UAS 2615: the presentation to the RP of the information to safely operate the UA (see also 15.5.1.2 referring to functions identified in 15.4.2)

To establish the demonstration of compliance, the following verification is expected:

- Establish a substantiation plan, utilizing a combination of analysis, inspection, dedicated ground/ flight/ simulator tests, demonstration flight hours (FH). Consider 15.1 and 15.2 as guidance, applying it with regard to the functions addressed by SC Light-UAS 2615: the presentation to the RP of the information to safely operate the UA)
- During the agreed overall flight test activities it should be positively demonstrated that no loss of control due to gaps in the information presented to the remote crew occurred and, also, that no reporting took place regarding significant issues linked to non-compliance with Light UAS 2615.