Irish Aviation Authority The Times Building 11-12 D'Olier Street Dublin 2, Ireland www.iaa.ie **Safety Regulation Division**	**Údarás Eitlíochta na hÉireann** Foirgneamh na hAmanna 11-12 Sráid D'Olier Baile Átha Cliath 2, Éire **Rannán na Rialachán Sábháilteachta**	**UAS ADVISORY MEMORANDUM (UAM)** NO. UAM 013 ISSUE 7 DATE 16.12.2024	

Guidance on Enhanced Containment, Flight Termination Systems, and MoC Light-UAS.2511

1. Change Record

Date	Issue	Revision Description
28.11.2023	1	Initial publication.
30.11.2023	2	Annex A update
26.01.2024	3	Annex A update
22.02.2024	4	Annex A update
10.05.2024	5	Annex A update
23.07.2024	6	Annex A Update
16.12.2024	7	New section - 8.The Maximum Take-off Mass (MTOM).

2. References

- Regulation (EU) 2019/947, on the rules and procedures for the operation of unmanned aircraft.[1]
- Means of Compliance with Light-UAS.2511 Containment[2]

3. Purpose

The purpose of this guidance document is to outline the requirements for enhanced containment and associated means of compliance to Light-UAS.2511.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0947&from=EN
[2] https://www.easa.europa.eu/en/downloads/136458/en

4. Definitions

For the purposes of this guidance document, the definitions in Regulation (EU) 2019/947, Irish Aviation Authority Act, 1993 and S.I. No. 24 of 2023 apply.

5. Enhanced Containment

Step #9 of the Specific Operations Risk Assessment (SORA)[3], addresses adjacent area and airspace considerations. It addresses *"the risk posed by a loss of control of the operation, resulting in an infringement of the adjacent areas on the ground and/or adjacent airspace".*

"No probable failure of the UAS or any external system supporting the operation should lead to operation outside the operational volume".

Enhanced containment is required for operations:

(1) either where the adjacent areas:

- (i) contain assemblies of people[1] unless the UAS is already approved for operations over assemblies of people; or
- (ii) are ARC-d unless the residual ARC of the airspace area intended to be flown within the operational volume is already ARC-d;

(2) Or where the operational volume is in a populated area where:

- (i) M1 mitigation has been applied to lower the GRC; or
- (ii) operating in a controlled ground area.

A Flight Termination System (FTS) is one method that may be used to address this containment requirement.

6. MoC Light-UAS.2511

The *"MoC is meant for a declaration toward the competent authority issuing the operational authorisation for operations up to SAIL II. It provides the possibility, for UAS leveraging FTS, to substantiate, with a simple design checklist and a set of tests, the FTS performances".*

It provides "*a design checklist and a set of tests"* whose "*application and successful passing can be utilized to credit an FTS install on a UAS with a probability of failure < 10^{-2} / Flight Hours".* Please see the MoC for details.

[3] Reg (EU) 2019/947 AMC1 Art 11 2.5.3

7. Applications to the Authority.

Operators wishing to use an FTS as a method to address the enhanced containment requirement should:

- Request a declaration of compliance with MoC.2511 and associated evidence from the manufacturer of their FTS and submit with their operational authorisation application, or
- Utilise a UAS/FTS configuration already assessed as compliant by the Authority. See Annex A. This will be updated as new evidence is received.

Note:

Depending on UAS FTS combination, FTS can be integrated in the following ways:

1. FTS only
2. Combined FTS & Parachute Recovery System (PRS)
3. Independent FTS & PRS
4. Manufacturer.

Annex A provides a list of FTS (add-ons) that are declared by the FTS manufacturer to be MoC Light-UAS.2511 compliant.

It is the UAS operators' responsibility to determine the UAS/ FTS combination that meets the operational requirement.

Ground Risk Buffer (GRB) - where applicable, operators should consider the effect of PRS deployment after triggering the FTS. For example, it is possible that deployment of the PRS in the contingency volume can be affected by wind drift, resulting in the UAS landing beyond the GRB. Operators shall use GRB distance defined in extant regulation as the absolute minimum.

Conversion Kits - FTS PRS integrated into UAS with a class identified label may potentially change the class identifier once EU Declaration of Conformity requirements are met. In this scenario, the FTS PRS manufacturer is responsible for the UAS class identifier conversion and statement of conformance[4]. This UAS class identifier must reflected in the operator's documentation.

8. The Maximum Take-off Mass (MTOM).

It is incumbent on the UAS Remote Pilot, before starting an UAS operation, to ensure that the UAS is in a safe condition to complete the intended flight safely [Regulation (EU) 2019/947 UAS.SPEC.060 (2)(c) refers]. Among other requirements the remote pilot must 'ensure that any payload carried is

[4] https://www.easa.europa.eu/en/domains/civil-drones-rpas/open-category-civil-drones

properly secured and installed, respecting the limits for the mass and CG [Centre of Gravity] of the UA' [AMC1 UAS.SPEC.060(2)(c) refers].

ASD-STAN prEN 4709-001[5] allows for a MTOM margin of ± 3 % for Class C0 and Class C1 UA and a ± 2 % margin for Class C2, Class C3 Class C4. Please refer to this ASD-STAN for further guidance.

Consideration should also be given to the possibility of a reduction in battery power.

[5] ASD-STAN | Setting the Standards for the Aerospace, Aviation & Defence Industry

Manufacturer	Flight Termination System	UAS
AVSS[6]	PRS-M300EX	DJI M300
AVSS	PRS-M350EX	DJI M350
Dronavia[7]	FTS-MOC KRONOS	DJI Inspire 3
Dronavia	FTS-MOC KRONOS	DJI M350
Dronavia	FTS-MOC KRONOS	DJI M300
Dronavia	Zéphyr CC	DJI M30
Dronavia[9]	Zéphyr CC MVC3	DJI Mavic 3
Dronavia[9]	PRS-FTS-MOC Kronos AD Mavic 3	DJI Mavic 3
Drone Rescue Systems	Drone Rescue System	DJI M600 pro
ParaZero[8]	SafeAir	DJI M300
ParaZero[9]	SafeAir	DJI Mavic 3
ParaZero	SafeAir	DJI M350
ParaZero	SafeAir	DJI M30

[6] https://www.avss.co/
[7] https://www.dronavia.com/en/
[8] https://parazero.com/
[9] Applies to the following DJI Mavic 3 models: Pro, Cine, Pro Cine, E (without RTK module), T, Classic, Multispectral
[9] Applies to the following DJI Mavic 3 models: Pro, E (without RTK module)