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 002 ISSUE 1 DATE 03.09.2021	

Guidance on PDRA-S01 & PDRA-S02 Flight Termination & Impact Reduction Technical Requirements

1. Change Record

Date	Issue	Revision Description
03.09.2021	1	Initial publication.

2. References

- Regulation (EU) 2018/1139[1]
- Regulation (EU) 2019/947[2]
- Regulation (EU) 2019/945[3]
- Opinion No 05/2019[4]

3. Purpose

The purpose of this guidance document is to provide guidance on certain UAS technical requirement for operations in the Specific Category. Specifically, flight termination under PDRA-01 & PDRA-02, & a means to reduce the effect of the UA impact dynamics under PDRA-01.

[1] https://www.easa.europa.eu/sites/default/files/dfu/Easy_Access_Rules_for_the_Basic_Regulation.pdf

[2] https://www.easa.europa.eu/sites/default/files/dfu/Easy%20Access%20Rules%20for%20Unmanned%20Aircraft%20Systems.pdf

[3]https://www.easa.europa.eu/sites/default/files/dfu/Easy%20Access%20Rules%20for%20Unmanned%20Aircraft%20Systems.pdf

[4] https://www.easa.europa.eu/sites/default/files/dfu/Opinion%20No%2005-2019.pdf

This is a guidance document only & subject to change pending further update and / or clarification from EASA.

4. Definitions

For the purposes of this guidance document, the definitions in Regulation (EU) 2018/1139, Regulation (EU) 2019/945 & Regulation (EU) 2019/947 apply.

5. Regulation

Under PDRA-S01 there is a technical requirement for the UAS to *"comply with the requirements of Part 16 of the Annex to Regulation (EU) 2019/945"* with some exceptions[5] & under PDRA-02 a similar requirement to *"comply with the requirements of Part 17 of the Annex to Regulation (EU) 2019/945"* with some exceptions[6].

5.1. PDRA-S01

5.1.1. Reg (EU) 2019/945, Annex Part 16 — Requirements for a class C5 unmanned aircraft system & C5 accessories

"… A class C5 UAS shall comply with the requirements defined in Part 4 [with some exceptions] …

… (6) unless tethered, provide means for the remote pilot to terminate the flight of the UA, which shall:

(a) Be reliable, predictable & independent from the automatic flight control & guidance system; this applies also to the activation of this means.

(b) Force the descent of the UA & prevent its powered horizontal displacement.

(c) Include means to reduce the effect of the UA impact dynamics. …"

5.2. PDRA-S02

5.2.1. Reg (EU) 2019/945, Annex Part 17 — Requirements for a class C6 unmanned aircraft system

"… A class C6 UAS shall comply with the requirements defined in Part 4 [with some exceptions] …

… (5) provide means for the remote pilot to terminate the flight of the UA, which shall:

[5] Reg (EU) 2019/947, AMC4 Article 11 Rules for conducting an operational risk assessment

[6] Reg (EU) 2019/947, AMC5 Article 11 Rules for conducting an operational risk assessment

(a) be reliable, predictable, independent from the automatic flight control & guidance system & independent from the means to prevent the UA from breaching the horizontal & vertical limits as required in point (4); this applies also to the activation of this means.

(b) force the descent of the UA & prevent its powered horizontal displacement. …"

5.3. PDRA S-01 & PDRA S-02

5.3.1. Reg (EU) 2019/947, AMC4 Article 11 Rules for conducting an operational risk assessment

"… (5) Unless tethered, in case of a loss of the command & control link, have a reliable & predictable method for the UA to recover the command & control link or, if it fails, terminate the flight in a way that reduces the effect on third parties in the air or on the ground. …"

6. Guidance

6.1. Flight Termination

EASA in Opinion No 05/2019 states: "*the FTS needs to allow the remote pilot to prevent the UA from exiting the controlled ground area. Thus, the FTS should force the descent of the UA and prevent it from continuing its horizontal trajectory (e.g. by cutting the propulsion power) and avoid a single failure in the UA disabling the activation of the FTS. Therefore, the activation system is required to be independent from the on-board automatic flight control and guidance system of the UA*[7]".

The operator must demonstrate in their application the independence from the on-board automatic flight control and guidance system.

6.2. Means to reduce the effect of the UA impact dynamics

EASA in Opinion No 05/2019 states that "*experience with this type of UAS operations [mainly French scenario S-3] has shown that human factors may play a role in reducing the effectiveness of the FTS. In particular, there is a risk that the remote pilot does not activate the FTS in time, fearing the damage and the potential destruction of the UA. To mitigate this risk, a requirement to reduce the effect of the UA impact dynamics (e.g. a parachute, autorotation, etc.) has been added*[8]".

As seen from the opinion, the requirement is a human factors risk mitigation. The operator must demonstrate a means to reduce the effect of the UA impact dynamics in their application.

[7] Opinion No 05/2019 2.3.1.9 Technical requirements in STS-01

[8] Opinion No 05/2019 2.3.1.9 Technical requirements in STS-01

6.3. Responsibility

Please note that, ultimately it is the responsibility of the operator to propose a means to & demonstrate compliance with the regulation. The IAA will assess each proposal on a case by case basis.