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Guidance on PDRA-S01 & PDRA-S02 Flight Termination System (FTS) Technical Requirements

1. Change Record

Date	Issue	Revision Description
03.09.2021	1	Initial publication.
24.11.2021	2	Inclusion of Reg (EU) 2018/1139 Basic Regulation, Article 71 Flexibility Provisions temporary exemption and additional guidance on the FTS.

2. References

- Regulation (EU) 2018/1139¹
- Regulation (EU) 2019/947²
- Regulation (EU) 2019/945³
- Opinion No 05/2019⁴

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>

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.

In addition, to provide further guidance on the temporary exemption to the above requirement under Reg (EU) 2018/1139 Basic Regulation, Article 71 Flexibility Provisions as detailed in Aeronautical Notice U.09 Exemption to Flight Termination System requirements for UAS Operations under PDRA S-01 & S02.

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 exceptions⁵ & under PDRA-02 a similar requirement to “*comply with the requirements of Part 17 of the Annex to Regulation (EU) 2019/945*” with some exceptions⁶.

5.1. PDRA-S01

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

“... UAS shall comply with the requirements defined in Part 4 [with some exceptions] ...

... (5) 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.

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

(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

“... 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:

(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. ...”

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”*.

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

Please note the FTS should be operational at all heights of the operation. Some FTS, designed to work in conjunction with a parachute, only activate at a set height.

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*

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

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 added⁸".

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.

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.

7. Exemption

7.1. Rationale

The IAA recognise the difficulty operators are facing in meeting the requirements before the expiration of the national Special Operating Permissions (SOP) on 31st Dec 2021.

7.2. Specifics

To provide time for operators to comply, the IAA are providing a general exemption until 31st March 2022, from the following:

- Part 16 of the Annex to Delegated Regulation (EU) 2019/945, para 5 as it pertains to Commission Implementing Regulation (EU) 2019/947, AMC4 to Article 11, para b, Table PDRA-S01.1 - Main limitations and provisions for PDRA-S01, para 6 - Technical provisions, para 6.1.

"... (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. ..."

- Part 17 of the Annex to Delegated Regulation (EU) 2019/945, para 5 as it pertains to Commission Implementing Regulation (EU) 2019/947, AMC4 to Article 11, para b, Table PDRA-S02.1 - Main limitations and provisions for PDRA-S02, para 6 - Technical provisions, para 6.1.

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

“... (5) 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 & 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. ...”

7.3. Limitations

The exemption is subject to the following limitations:

- UAS operations conducted with a UA with a MTOM of less than 2 kg.
- UAS operations within the UAS Prohibited Geographical Zones around airports or adjacent to assemblies of people are excluded from this exemption.

7.4. Operational Authorisations

Operators may apply for an operational authorisation under PDRA-S01 or PDRA-S02 without meeting the FTS requirements, subject to the limitation outlined. However, operators utilising this exemption shall be required to meet the FTS requirements by 01st May 2022 or their authorisation will no longer be valid.