**FOCA-UAS-GM-PDRAS01-TRAIN(T)**

**Accreditation of completion of THEORETICAL training**

**As per condition #5.3.7 of** [**AMC4 to Article 11 to (EU) 2019/947**](https://www.easa.europa.eu/en/document-library/easy-access-rules/online-publications/easy-access-rules-unmanned-aircraft-systems?page=4#_Toc18667494_0)

***Important notice: This accreditation does NOT constitute a certificate of remote pilot theoretical knowledge as required under*** [***UAS.STS-01.020(e)(i)***](https://www.easa.europa.eu/en/document-library/easy-access-rules/online-publications/easy-access-rules-unmanned-aircraft-systems?page=8#_DxCrossRefBm153270285) ***and*** [***UAS.STS-02.020(7)(a)***](https://www.easa.europa.eu/en/document-library/easy-access-rules/online-publications/easy-access-rules-unmanned-aircraft-systems?page=8#_DxCrossRefBm153270285)***. It does not authorise remote pilots to operate under the framework of the standard scenarios.***

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| **1. UAS Operator** | | | | | | |
| **1.1** | UAS Operator Name: | | Insert text | | | |
| **1.2** | UAS Operator Registration Number: | | Insert text | | | |
| **1.3** | Operational Point of Contact: | | First & Last name: | | Insert text | |
| Email address: | | Insert text | |
| Phone number: | | Insert text | |
| **2. Theoretical training provider** | | | | | | |
| **2.1** | The UAS operator itself (as indicated in Section 1 above) *🡪* *Please go to Section 3.* | | | | | |
| Another entity / UAS operator *🡪* *Please continue below.* | | | | | |
| **2.2** | Training Provider Name: | | Insert text | | | |
| **2.3** | UAS Operator Number of the Training Provider (if applicable): | | Insert text | | | |
| **2.4** | Responsible Person for Training: | | Name: | | Insert text | |
| Email address: | | Insert text | |
| Phone number: | | Insert text | |
| **2.5** | Training Provider Address: | | Street: | | Insert text | |
| Zip, City: | | Insert text | |
| Country: | | Insert text | |
| **3. Training details** | | | | | | |
| **3.1** | Training start date: | Select date | | Training end date: | | Select date |
| **3.2** | Training location: | Insert text | | Training duration: | | Insert text hours |
| **3.3** | **Remote pilots undergoing theoretical training** | | | | | |
| *🡪 Please complete Appendix 1.* | | | | | |
| **3.4** | **Training and assessment program** | | | | | |
| *🡪 Please refer to Appendix 2.* | | | | | |

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| **4. Declarations** | | | | |
|  | I, the undersigned (§5.1), hereby certify that all information provided in this form is complete, true, and accurate. | | | |
| I, the undersigned (§5.1), hereby declare that the individuals listed in Appendix 1 have effectively and successfully completed the required training and have demonstrated the required level of knowledge in accordance with the syllabus outlined in Appendix 2. | | | |
| **5. Signatures** | | | | |
| **5.1** UAS Operator | | | **5.2** Training provider (if different from the UAS operator) | |
| Name of accountable manager: | | Insert text | Name: | Insert text |
| Date: | | Select date | Date: | Select date |
| Place: | | Insert text | Place: | Insert text |
| Signature: | | | Signature: | |
|  | | |  | |

**Next steps**

* Please send this form **in PDF format** to [rpas@bazl.admin.ch](mailto:rpas@bazl.admin.ch) together with the relevant application form and other supporting documents.

Kindly ensure that Appendix 1 below is duly completed before submission.

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| **APPENDIX 1**  **Remote pilots (RP) undergoing theoretical training** | | |
| **RP #1** | First name: | Insert text |
| Last name: | Insert text |
| Remote Pilot Identification Number: | Insert text |
| **RP #2** | First name: | Insert text |
| Last name: | Insert text |
| Remote Pilot Identification Number: | Insert text |
| **RP #3** | First name: | Insert text |
| Last name: | Insert text |
| Remote Pilot Identification Number: | Insert text |
| **RP #4** | First name: | Insert text |
| Last name: | Insert text |
| Remote Pilot Identification Number: | Insert text |
| **RP #5** | First name: | Insert text |
| Last name: | Insert text |
| Remote Pilot Identification Number: | Insert text |
| **RP #6** | First name: | Insert text |
| Last name: | Insert text |
| Remote Pilot Identification Number: | Insert text |
| **RP #7** | First name: | Insert text |
| Last name: | Insert text |
| Remote Pilot Identification Number: | Insert text |
| **RP #8** | First name: | Insert text |
| Last name: | Insert text |
| Remote Pilot Identification Number: | Insert text |

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| **Declaration** |
| **Each individual listed in Appendix 1 has demonstrated the required level of knowledge for each of the topics outlined in Appendix 2 of this form.** |

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| **Signature** | |
| Name of accountable manager: | Insert text |
| Date: | Select date |
| Place: | Insert text |
| Signature: |  |

**APPENDIX 2**

**Theoretical training and assessment syllabus**

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# **010** Aviation Regulations

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| **General elements on the Specific category** |
| * Be familiar with the general elements of the 'Specific' category. |
| * Be familiar with the conditions to operate in a different country than the Member State of registration. |
| * Describe the general remote pilot's responsibilities in the 'Specific' category. |
| * Be familiar with the general operator's responsibilities in the 'Specific' category. |
| **Risk assessment and introduction to SORA** |
| * Be familiar with the risk assessment principle. |
| * Describe that a risk assessment has already been conducted for standard scenarios. |
| * Define 'SORA' acronym and be able to briefly explain what it consists of in. |
| * Be familiar with the concept of PDRAs. |
| * Be familiar with the list of PDRAs published so far (UAS characteristics, VLOS/BVLOS, overflown area, maximum range from remote pilot, maximum height, airspace). |
| **PRE-DEFINED RISK ASSESSMENTS** |
| **PDRA-S01** |
| * Be familiar with the general provisions applicable to PDRA-S01. |
| * Be familiar with the operational conditions applicable to PDRA-S01. |
| * Be familiar with the operator's responsibilities applicable to PDRA-S01. |
| * Describe the remote pilot's responsibilities applicable to PDRA-S01. |
| **ADDITIONAL KNOWLEDGE ON AIRSPACE AND AERONAUTICAL INFORMATION** |
| **General** |
| * Be familiar with the concept of airspace sovereignty and the overall airspace designations. |
| * Describe the different airspace classes. |
| * Describe the operating restrictions in different classes of airspace. |
| * Explain how segregated airspace is established and managed. |
| **Airspace reservations** |
| * Define danger, prohibited and restricted areas. |
| * Explain the meaning of these areas for the remote pilot. |
| * Be able to find information on these areas. |
| **Obtaining and interpreting aeronautical information** |
| * Define 'AIP' acronym (Aeronautical Information Publication) and explain what it consists of. |
| * Be familiar with the way to access the AIP. |
| * Define 'AIC' acronym (Aeronautical Information Circular) and explain what it consists of in. |
| * Define 'NOTAM' acronym (NOtice To AirMen) and explain what it consists of in. |
| * Be able to obtain and interpret NOTAMs. |
| * Be able to access and interpret aeronautical maps and charts. |

# **020** Human Performance Limitations

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| **MEDICAL FITNESS** |
| **Fatigue** |
| * Be aware that the flight should be conducted within working hours. |
| * Know about the circadian rhythm and the effect on fatigue. |
| * Be aware of the influence of work stress on fatigue. |
| * Be aware of the influence of commercial pressure on fatigue. |
| **Health precautions** |
| * Know that health precautions such as regular sport and healthy nutrition help to stabilize a good mental and physical health status. |
| **HUMAN PERCEPTION** |
| **Situational awareness** |
| * Know about the factors of situational awareness in VLOS operations, especially regarding the “See and Avoid” principle. |
| **Environmental influences** |
| * Be aware of the influences on vision due to the sun. |
| * Be aware of influences on vision due to the other meteorological conditions (e.g. snow, heavy rain, volcanic ashes). |
| * Be aware of the influences on the capability to fly a UAS due to extreme weather (e.g. hot or cold temperatures, wind, icing, precipitation). |
| * Be able to name consequences of extreme weather on humans to fly a UAS (e.g. hypothermia, frostbite, impairment of fine motor skills, reduced situational awareness, sunburn). |
| **Attentiveness** |
| * Be able to exercise and to explain the visual scan technique of scanning 10-15° each way to find other traffic. |
| * Know that other traffic is often hard to spot visually. |
| * Be aware that it is vital to eliminate any distraction during flight operation. |

# **030** Operational Procedure

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| **PRE-FLIGHT** |
| * Be aware that, in addition to the typical pre-flight actions, the remote pilot shall verify that the means to terminate the flight (e.g. FTS) of the UAS are operational, and that the direct remote identification is active and up to date. |
| * Know about the geo-caging function. |
| * Be aware that the remote pilot must ensure the adequacy of the controlled ground area defined by the operator. |
| **IN-FLIGHT** |
| **Contingency procedures** |
| * Be familiar with the typical actions to be performed by the remote pilot and/or by the persons essential to the UAS operation in case of intrusion of uninvolved persons into the controlled ground area. |
| **Emergency procedures** |
| * Be familiar with the typical actions to be performed by the remote pilot in case a Combination Stick Command (CSC) or FTS does not work properly. |
| **Emergency Response Plan (ERP)** |
| * Define the acronym 'ERP'. |
| * Describe what an ERP consists of. |
| * Be familiar with the typical actions to be performed by the remote pilot and/or by the persons essential to the UAS operation in case the UA flies out of the volume represented by the controlled ground area. |

# **040** Technical Operational Mitigations for Air Risk

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| **GENERAL** |
| * Be familiar with 'risk' and 'air risk' notions. |
| * Define the following terms: technical mitigations, operational mitigations, strategic mitigations, tactical mitigations. |
| * Be familiar with the 'see and avoid'/'detect and avoid' principles. |
| **AIR RISK IN PDRA-S01** |
| * Be aware that the air risk posed by an UAS operation conducted in PDRA-S01 is addressed by the VLOS operational mitigation, which allows the remote pilot to maintain a thorough airspace scan of the airspace surrounding the unmanned aircraft to avoid any risk of collision with other aircrafts ('see and avoid' principle). |
| * Be aware that the remote pilot may be assisted by a visual observer in his 'see and avoid' responsibility, and that, in such a case, clear and effective communication shall be established between them. |
| * Be aware that the air risk posed by a UAS operation conducted in PDRA-S01 is also addressed by a technical mitigation, which consists in the UAS being equipped with a Flight Termination System (FTS). |

# **050** UAS General Knowledge

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| **Basic knowledge** |
| * Be familiar with the technical information contained in a UAS user manual / flight manual. |
| **ADVANCED UAS GENERAL KNOWLEDGE** |
| **Flight Termination System (FTS)** |
| * Be familiar with the FTS operating principle. |
| * Describe the main objective of an FTS. |
| **Geo-caging function** |
| * Be familiar with the geo-caging function operating principle. |
| **Advanced knowledge on batteries** |
| * Describe the main battery parameters (Ah, voltage, charge and discharge rates). |
| * Describe the battery configurations (parallel and series). |
| **Sensors** |
| * Define the acronym 'IMU' (Inertial Measurement Unit) and its operating principle. |
| * Describe the difference between indicated and true airspeeds. |
| * Be familiar with altitude/height measurement principles for unmanned aircraft. |

# **060** Meteorology

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| **WEATHER EFFECTS ON THE UAS** |
| **Wind** |
| * Be able to interpret given wind directions on a wind rose. |
| * Know about different wind speed units and their conversion (kt, km/h, m/s, Beaufort). |
| * Be able to explain the influence of surface friction on wind direction. |
| * Be able to forecast the approximate change in wind direction and speed compared to layers free from friction. |
| * Be able to name the influence of different surface types / friction on wind. |
| * Be able to determine different forms of turbulence (e.g. frictional, convective, orographic, obstacles). |
| * Be able to detect typical zones with turbulence (e.g. below forming Cumulonimbus clouds). |
| * Be aware of reasons for turbulence close to the ground (e.g. when approaching; rows of trees; heating of surfaces). |
| * Be aware of dangers that arise from wind phenomena (e.g. turbulences, gusts) during UAS operations. |
| **Temperature** |
| * Be able to state the vertical temperature distribution in the troposphere. |
| * Know about different units and their conversion (°C, °F, K). |
| * Know about diurnal and annual temperature changes. |
| * Be able to determine effects of temperature on batteries and flight performance. |
| * Be able to name dangerous effects of low temperatures and icing. |
| **Atmospheric pressure** |
| * Be able to define 'atmospheric pressure'. |
| * Be able to define 'high' and 'low' pressure areas. |
| * Be able to list the common units of measurement of atmospheric pressure in aviation (hPa, inHg). |
| * Know about the relationship between pressure and altitude (air pressure halves every 5,500 m). |
| **Visibility** |
| * Be able to name radiation and advection fog as the most common types of fog. |
| * Know about the preconditions of fog formation. |
| * Be able to estimate the development of radiation and advection fog. |
| * Be able to name factors influencing visibility (e.g. fog, mist, haze, sunlight, pollution, precipitation). |
| * Be able to name options to assess the visibility on the spot (e.g. reference objects). |
| * Be able to differentiate fog from mist in terms of visibility. |
| **Density** |
| * Know about the relationship between pressure, temperature and density (e.g. what happens to the density if the temperature rises, and pressure remains constant). |
| * Know that the density decreases with altitude. |
| * Be aware that a change of density influences lift at rotor blades. |
| **Regional weather effects** |
| * Be able to explain the diurnal course of land and sea breeze. |
| * Be able to name effects of land and sea breeze. |
| * Be able to name dangers when flying in or near mountains (e.g. strong downwind, low density). |
| * Be able to name dangers in desert regions (e.g. dust, diurnal course of temperature, strong wind). |
| **OBTAINING WEATHER INFORMATION** |
| **Weather report resources and briefing** |
| * Be aware of the duty to obtain weather information for a pre-flight briefing. |
| * Know about the most influencing weather factors (wind, extreme temperature, strong precipitation). |
| * Be able to explain and interpret the term 'UTC'. |
| * Be able to name options to obtain weather information (e.g. national weather service). |
| * Interpret simple weather charts and reports. |
| **Weather reports** |
| * Be able to explain the difference between current weather reports and forecast data. |
| * Be able to obtain and extract useful data from a METAR report. |
| * Be able to obtain and extract useful data for a SPECI report. |
| * Be able to obtain and extract useful data for a TAF report. |
| **Weather charts** |
| * Be able to interpret radar and lightning images. |
| * Be able to interpret satellite imagery. |
| * Be able to interpret surface weather charts. |
| **Local weather assessments** |
| * Know how to evaluate the current local wind direction and speed. |
| * Be aware of weather changes and their probable meaning (e.g. sudden gusts, cloud development). |
| * Know about the possible difference between local weather and weather reports. |

# **070** UAS Flight Performance

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| **TYPICAL OPERATIONAL ENVELOPES** |
| * Be aware that each unmanned aircraft has an approved flight envelope within which safe flight, under normal, abnormal and emergency conditions, and emergency recovery capabilities, are demonstrated. |
| * Know that UAS operating limitations must always be observed. |
| * Be aware that different UAS types (rotorcrafts, fixed wings, hybrid configurations) may have different approved flight envelopes and different operating limitations, especially due to their design, and that oneself should take the necessary time to self-appropriate these limitations. |
| **MASS AND BALANCE & CENTRE OF GRAVITY** |
| * Define and explain the meaning of 'MTOM' and be aware that MTOM is a structural limitation. |
| * Define and explain the meaning of 'CG'. |
| * Be familiar with the effect of CG on fuel consumption. |
| * Explain the reasons for having an adequate tie-down of payload components. |
| * Be aware that, due to their differences in characteristics, payload components may impact the stability of the flight. |
| * Be aware that each type of unmanned aircraft has a different CG position and be able to explain why. |
| * Describe the relationship between CG position and stability/controllability of unmanned aircraft. |
| * Describe the consequences if the CG is in front of the forward limit. |
| * Describe the consequences if the CG is behind the aft limit. |
| **PAYLOAD SECURING** |
| * Be aware that payload components must be well secured before take-off to ensure the safety of the flight. |
| **BATTERIES** |
| * Be familiar with battery technology to help prevent potential unsafe conditions. |
| * Be familiar with the existing different battery types, such as Li-Po, Li-ion, NiMH and Pb types. |
| * Be familiar with the terminology used for batteries, such as memory rate, capacity and c-rate. |
| * Be familiar with the charging, usage, danger and storage processes of a battery. |

# **080** Technical operational mitigations for ground risk

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| **DEFINITIONS AND RESPONSIBILITIES** |
| * Define the term 'ground risk'. |
| * Define the term 'controlled ground area'. |
| * Describe that the controlled ground area comprises the 'flight geography area', the 'contingency area' and the 'ground risk buffer'. |
| * Describe that the UAS operator may protect the controlled ground area by means of fencing or using other methods, as appropriate, considering the population density. |
| * Define the terms 'flight geography' and 'flight geography area'. |
| * Define the terms 'contingency volume' and 'contingency area'. |
| * Describe the minimum external limits of the contingency area for PDRA-S01 operations. |
| * Define the term 'operational volume'. |
| * Define the term 'ground risk buffer'. |
| * Be aware that, as a general responsibility, the remote pilot shall ensure that the operating environment is compatible with the declared limitations and conditions, including the controlled ground area defined by the operator. |
| * Be able to find and to determine the minimum distance to be covered by the ground risk buffer (untethered unmanned aircraft in PDRA-S01). |
| **GROUND RISK IN PDRA-S01** |
| * Explain why the intrinsic ground risk posed by UAS operations in PDRA-S01 is higher than the one posed by UAS operations conducted in the 'Open' category, and the purpose of the controlled ground area in this matter. |