▶This RA has been substantially re-written; for clarity no change marks are presented – please read RA in its entirety ◀

# RA 1600 – Uncrewed Air Systems Categorization

#### **Rationale**

There is a requirement to acquire, categorize, develop, and operate appropriate Uncrewed Air Systems (UAS). Therefore, there needs to be in place a proportionate Regulatory and Certification framework; this is based on the UAS's operating intent and the level of Risk their proposed activity poses. Categorization sets a proportionate regulatory framework to ensure that UAS operations are conducted safely, based on the Risk that UAS operations pose to involved and Uninvolved Persons1 on the ground and to other air users. The process of UAS Categorization considers both the UAS type and method of operation. The Risk is dependent on many factors including, but not limited to Uncrewed Aircraft (UA) physical attributes (eg mass, dimensions, speed, energy, etc), range of operation, duration of exposure2, robustness of link, the nature of the airspace, the Quality of training, and the experience of the operating unit and Remote Pilot (RP). As the Risk increases, the robustness of the Assurance required to demonstrate that operations are safe will increase. Without agreed regulatory frameworks to assist organizations to acquire, categorize, develop, and operate appropriate UAS, UAS may present uncontrolled and unmitigated Risks to Life (RtL). The categorization of UAS (which considers both UAS type and method of operation) directs which Regulation and Acceptable Means of Compliance (AMC) apply. This Regulatory Article (RA) provides an overview of the Categorization system and directs the regulatory requirements to ensure that organizations acquire appropriate UAS and correctly operate them in the relevant Category<sup>3</sup> to enable suitable regulatory frameworks to be applied to their operation. This will ensure that UAS are safe to operate and are being operated safely throughout their life.

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#### **Definitions**

#### Definitions relevant to the RA 1600 Series

- Terms, defined in MAA02, that are relevant to the RA 1600 Series (non-1 exhaustive list):
  - а Air System.
  - b. Aircraft.
  - c. Aircrew.
  - Areas of high population density. d.
  - Armed Uncrewed Air System (Armed UAS). e.
  - f. Beyond Visual Line Of Sight (BVLOS).
  - Command and Control link. g.
  - h. Command Unit.
  - i. Congested Areas.
  - j. Controlled Airspace (CAS).
  - k. Controlled Flight Into Terrain (CFIT).
  - I. Danger Area.
  - Defence Air Environment (DAE) Operating Categories. m.

<sup>&</sup>lt;sup>1</sup> Refer to MAA02 – Military Aviation Authority Master Glossary.

<sup>&</sup>lt;sup>2</sup> Exposure is a function of the numbers of people at Risk from the operation and the time during which they are at Risk.

<sup>&</sup>lt;sup>3</sup> Hereafter "Category" refers to Category and / or sub-categories. Hereafter the terms 'categorize', 'categorized', and 'categorization' refers to the MAA-endorsed UAS Category and / or sub-category which defines an appropriate Regulatory framework.

#### **Definitions**

- n. Detect and Avoid.
- o. Drone.
- p. Dropping of materiel.
- q. Ground Control Station (GCS).
- r. Layered Safety Approach (LSA).
- s. Loitering Munition.
- t. Lost link.
- u. Medical Certificate.
- v. Payload.
- w. Period of Operation.
- x. Remote Pilot (RP).
- y. Remote Pilot Station (RPS).
- z. Remotely Piloted Aircraft (RPA).
- aa. Remotely Piloted Air System (RPAS).
- bb. Remotely Piloted Air System Accountable Manager (RPAS AM).
- cc. Remotely Piloted Air System Ground Operator (RGO).
- dd. Remotely Piloted Air System Responsible Officer (RPAS RO).
- ee. Segregated Airspace.
- ff. Sense and Avoid.
- gg. Special Purpose Clearance (SPC).
- hh. Suitably Qualified and Experienced Person (SQEP).
- ii. Swarm.
- jj. Uncrewed Aircraft (UA).
- kk. Uncrewed Air System (UAS).
- II. Uncrewed Air System Accountable Manager (UAS AM).
- mm. Uncrewed Air System Ground Operator (UGO).
- nn. Uncrewed Air System Observer (UAS Observer).
- oo. Uncrewed Air System Responsible Officer (UAS RO).
- pp. Uninvolved Person.
- qq. Visual Line Of Sight (VLOS).
- 2. Terms, not defined in MAA02, that are tangentially relevant to the RA 1600 Series:
  - a. **Artificial Intelligence (AI).** A family of general-purpose technologies, any of which may enable machines to perform tasks normally requiring human or biological intelligence, especially when the machines learn from data how to do those tasks. (Sourced from: Defence AI Strategy June 2022)
  - b. **Autonomous Operations.** An operation during which a UA operates without the RP being able to intervene, however autonomous operations are not inclusive of emergency procedures. (Source derived from: UK Civil Aviation Authority (CAA) Publication (CAP) 722D)
  - c. **First Person View (FPV) UAS Operations.** FPV UAS operations will be endorsed via the Categorization process. FPV UAS are UAS fitted with video cameras downlinking live video to the RP via the Command Unit or through video goggles. This capability provides the RP with a pseudo pilot's eye view from the UAS. FPV UAS Operations will have a UAS Observer to ensure safe separation. The UAS Observer will be situated alongside the RP and will not

#### **Definitions**

use aided vision (eg binoculars)<sup>4</sup>. In all cases, the RP is still responsible for the Safety of the flight<sup>5</sup>.

- d. **Machine Learning.** Computer algorithms that can 'learn' by finding patterns in sample data and then apply this to new data to produce useful outputs, often using neural networks. (Sourced from: Defence Al Strategy June 2022)
- e. **Small UAS (sUAS).** Open Category and Specific S1 sub-category (that have a Maximum Take-off Weight (MTOW) less than 25 kg) are deemed to be sUAS.
- f. **Tethered UA.** A UA that remains securely attached (tethered) via a physical link to a person, the ground or an object at all times while it is flying. The tether normally takes the form of a flexible wire or a cable and may also include the power supply to the Aircraft as well. (Source derived from: UK CAA CAP 722).
- g. **Extended Visual Line Of Sight (EVLOS).** This definition has been deleted from MAA02 as the term is not used in the MAA Regulatory Publications (MRP). If future amendments include reference to EVLOS in the UAS Regulations, then a description will be added to the UAS Regulations. On a case-by-case basis EVLOS requirements can be discussed with the MAA (potentially with a Regulatory Waiver). The MRP does not prevent UAS organizations from utilizing EVLOS, however there is no current MAA regulatory requirements. Organizations operating EVLOS are to ensure compliance with the MRP throughout their Area of Responsibility.

## **Applicability**

#### Applicability of this RA

- 3. RA 1600 applies to UK Military Registered UAS, whether Military-Owned or Civilian-Owned and / or Military Operated or Civilian Operated. This includes Civilian-Owned and Civilian Operated UAS operating extra-territorially under contract to the MOD.
- 4. RA 1600 does not apply to:
  - a. Privately-owned UAS (ie non-MOD owned and not on the UK Military Aircraft Register (MAR)) operated by MOD personnel outwith their MOD duties (ie where the use is private or recreational).
  - b. Civil Registered or Unregistered Civilian-Owned UAS and Civilian Operated UAS operating, in accordance with (iaw) the Air Navigation Order / Overseas National Regulations, under contract to the MOD.
  - Other Nations's military UAS.
  - d. Military owned and operated FPV UAS not being used for military purposes (eg racing Drones). These UAS have to be registered with the appropriate aviation regulator (eg UK CAA, Federal Aviation Administration (FAA), European Union Aviation Safety Agency (EASA), etc).
  - e. Flights within buildings, or within areas where there is no possibility for the UA to escape into the open air (such as a closed netted structure).

#### Note:

One of the key Risks in the event of a UAS fly away event is the danger this could present to other air users, clearly this is mitigated when operating in enclosed spaces (eg indoors or within netted areas). Good Health and Safety policy, Duty of Care (DoC), and detailed Risk Assessments will still be carried out and a commonsense approach to operations be taken.

<sup>&</sup>lt;sup>4</sup> The use of corrective lenses and Night Vision Devices are permitted for UAS Observers.

<sup>&</sup>lt;sup>5</sup> This is based on the UK CAA's FPV webpage: <a href="https://www.caa.co.uk/drones/rules-and-categories-of-drone-flying/first-person-view-flying/">https://www.caa.co.uk/drones/rules-and-categories-of-drone-flying/first-person-view-flying/</a>.

- 5. UAS to be operated in the DAE are required to be categorized in one of three UAS Categories, which are:
  - a. Open Category
    - (1) Operations within the Open Category are those to be conducted with UAS that:
      - (a) Have the following mandatory requirements:
        - (i) Are operated within VLOS<sup>6, 7</sup> of the RP<sup>8</sup>,
        - (ii) Are not flown at a Height greater than 120 m (400 ft),
        - (iii) Have any maximum speed,
        - (iv) Are registered on the UK MAR by type<sup>9</sup>,
        - (v) Have a Military Aircraft Registration Number and unit identifier displayed on the main fuselage, and
        - (vi) Operate under the DAE Operating Framework<sup>10</sup> and be assigned to a DAE Operating Category<sup>11</sup>.
      - (b) Have the following optional requirements:
        - (i) Are capable of Swarming,
        - (ii) If conducting tethered operations; Adhere to noise limits, Height limits, and requirements for remote identification and geo-awareness Systems and additional requirements,
        - (iii) Are capable of being armed (only where an SPC has been endorsed by the MAA),
        - (iv) Are capable of carrying / transporting dangerous Cargo<sup>12, 13</sup>,
        - (v) Are capable of Dropping of materiel, and
        - (vi) Are capable of autonomous operations, with procedures covering the activities the RP is not directly controlling (including unplanned emergency conditions such as Lost link profiles).
    - (2) The Open Category is divided into three sub-categories with the following mandatory requirements:
      - (a) **Open A1<sup>14</sup>.** Operations within the Open A1 sub-category are those to be conducted with UAS that:
        - (i) Have a MTOW of less than 250 g,
        - (ii) Are capable of being operated safely to a minimum horizontal distance of 30 m from Uninvolved Persons, or down to 5 m horizontally if a 'low speed mode' is equipped

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<sup>&</sup>lt;sup>6</sup> UAS Categorized as Open A1 may be operated BVLOS when operating within buildings, vessels, and structures.

<sup>&</sup>lt;sup>7</sup> Certain demands may necessitate operations beyond the limitations covered by extant Letter of Endorsed Categorization (LEC). In these cases, an additional RA 1600 Annex B Appendix 2 or equivalent CFAOS (BU) paperwork will need to be submitted, for the additional permissions beyond the baseline LEC.

<sup>&</sup>lt;sup>8</sup> In 'follow-me' mode (the UA will automatically follow the Command Unit), the UA may be flown up to a maximum distance of 50 m from the RP, even if this means that the UA is no longer VLOS.

<sup>&</sup>lt;sup>9</sup> For UAS that will be operated within the Open and Specific S1 sub-categories, UK MAR registration is applied for within the Categorization Submission, and registration is inherent in the issuing of an LEC. See RA 1600 paragraph 19, and refer to RA 1161 – Military Registration of Air Systems Operating within the Defence Air Environment.

<sup>&</sup>lt;sup>10</sup> Refer to RA 1160 – The Defence Air Environment Operating Framework.

<sup>&</sup>lt;sup>11</sup> The DAE Operating Category relates to the ownership and Safety governance of the Air System, whereas the UAS Category relates to the regulatory framework which is set by the MAA according to the Risk posed by the UAS and the manner in which it is operated.

<sup>&</sup>lt;sup>12</sup> Refer to AAP-06 – The North Atlantic Treaty Organization (NATO) Glossary of Terms and Definitions (English and French).

<sup>&</sup>lt;sup>13</sup> For example (non-exhaustive list): Explosives, radioactive material, flammable liquids, dangerous or volatile chemicals, strong acids, compressed gases, biological agents, poisons.

<sup>&</sup>lt;sup>14</sup> Refer to RA 1601 – Uncrewed Air Systems Open A1 sub-category (Fly 'Over' People).

<sup>&</sup>lt;sup>15</sup> "low-speed mode" limits the maximum speed to 3 m/s when selected by the RP, if the UAS has an UK / EU conformity marking of C2 or is designed to similar standards.

- and selected, and not within 50 m of Congested Areas, but not flight over Areas of high population density, and
- (iii) Carry a UK / EU conformity marking of C0 or be designed to similar standards.
- (b) **Open A2**<sup>16</sup>. Operations within the Open A2 sub-category are those to be conducted with UAS that:
  - (i) Have a MTOW of less than 4 kg,
  - (ii) Are capable of being operated safely to a minimum horizontal distance of 30 m from Uninvolved Persons, or down to 5 m horizontally if a 'low speed mode'<sup>17</sup> is equipped and selected, and not within 50 m of Congested Areas, but not over Areas of high population density, and
  - (iii) Carry a UK / EU conformity marking of C0 C2 or be designed to similar standards.
- (c) **Open A3**<sup>18</sup>. Operations within the Open A3 sub-category are those to be conducted with UAS that:
  - (i) Have a MTOW of less than 25 kg,
  - (ii) Are capable of being operated safely to a minimum horizontal distance of 50 m from Uninvolved Persons and not within 50 m of Congested Areas, but not over Areas of high population density, and
  - (iii) Carry a UK / EU conformity marking of C0 C4 or be designed to similar standards.
- b. Specific Category
  - (1) Operations within the Specific Category are those to be conducted with UAS that:
    - (a) Have the following mandatory requirements:
      - (i) Have any maximum speed,
      - (ii) Operate under the DAE Operating Framework and be assigned to a DAE Operating Category.
    - (b) Have the following optional requirements:
      - (i) Are capable of Swarming,
      - (ii) If conducting tethered operations; Adhere to noise limits, Height limits, and requirements for remote identification and geo-awareness Systems and additional requirements,
      - (iii) Are capable of being armed (only where an SPC has been endorsed by the MAA),
      - (iv) Are capable of carrying / transporting dangerous Cargo,
      - (v) Are capable of Dropping of materiel, and
      - (vi) Are capable of autonomous operations, with procedures covering the activities the RP is not directly controlling (including unplanned emergency conditions such as Lost link profiles).
  - (2) The Specific Category is divided into two sub-categories with the following mandatory requirements:

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<sup>&</sup>lt;sup>16</sup> Refer to RA 1602 – Uncrewed Air Systems Open A2 sub-category (Fly 'Close To' People).

<sup>&</sup>lt;sup>17</sup> "low-speed mode" limits the maximum speed to 3 m/s when selected by the RP, if the UAS has an UK / EU conformity marking of C2 or is designed to similar standards.

<sup>&</sup>lt;sup>18</sup> Refer to RA 1603 – Uncrewed Air Systems Open A3 sub-category (Fly 'Far From' People).

- (a) **Specific S1**<sup>19</sup>. Operations within the Specific S1 subcategory are those to be conducted with UAS that:
  - (i) Have a MTOW of less than 25 kg.
  - (ii) Are required to operate BVLOS up to a maximum of 2,000 m from the RP,
  - (iii) Are not operated over Areas of high population density,
  - (iv) Are not flown at a Height greater than detailed within the manufacturer's guidelines,
  - (v) Carry a UK / EU conformity marking of C0 C4 or be designed to similar standards,
  - (vi) Are registered on the UK MAR by type,
  - (vii) Have a Military Aircraft Registration Number and unit identifier, or a local UAS serial number, displayed on the main fuselage, and
  - (viii) Are operated within Segregated Airspace.
- (b) **Specific S2**<sup>20</sup>. Operations within the Specific S2 subcategory are those to be conducted with UAS that:
  - (i) Have a MTOW of any weight<sup>21</sup>,
  - (ii) Are required to operate BVLOS of any distance from the RP,
  - (iii) Are capable of being operated safely over Areas of high population density,
  - (iv) Can be flown at any Height,
  - (v) Carry a UK / EU conformity marking of C0 C6 or be designed to similar standards,
  - (vi) Are registered on the UK MAR by type or tail (as detailed in RA 1161), and
  - (vii) Have a Military Aircraft Registration Number (if registered by tail), or Military Aircraft Registration Number and unit identifier (if registered by type), displayed on the main fuselage, and
  - (viii) Are operated within Segregated Airspace, iaw RA 2320, when BVLOS and within the UK Flight Information Region (FIR).
- c. **Certified Category<sup>22</sup>.** Operations within the Certified Category are those to be conducted with UAS that<sup>23</sup>:
  - (1) Have the following mandatory requirements:
    - (a) Have a MTOW of any weight,
    - (b) Are required to operate BVLOS of any distance from the RP,
    - (c) Are capable of being operated safely at a horizontal distance from Uninvolved Persons, and over Areas of high population density,
    - (d) Can be flown at any Height,

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<sup>&</sup>lt;sup>19</sup> Refer to RA 1604 – Uncrewed Air Systems Specific S1 sub-category.

<sup>&</sup>lt;sup>20</sup> Refer to RA 1605 – Uncrewed Air Systems Specific S2 sub-category.

<sup>&</sup>lt;sup>21</sup> Note: UAS operations conducted BVLOS and / or with a MTOW greater than 25 kg pose additional RtL, not only to those directly involved in launch and recovery but also, to Uninvolved Persons and other air users.

<sup>&</sup>lt;sup>22</sup> Refer to RA 1606 – Uncrewed Air Systems - Certified Category.

<sup>&</sup>lt;sup>23</sup> These characteristics may be approved in a lower Category where the overall Safety argument supports it.

- (e) Carry a UK / EU conformity marking of C0 C6 or be designed to similar standards,
- (f) Have any maximum speed,
- (g) Are registered on the UK MAR by tail,
- (h) Have a Military Aircraft Registration Number displayed on the main fuselage,
- (i) Are operated within Segregated Airspace, iaw RA  $2320^{24}$  (but not if the UAS is able to Detect and Avoid during Lost Link profiles)), and
- (j) Operate under the DAE Operating Framework and be assigned to a DAE Operating Category.
- (2) Have the following optional requirements:
  - (a) Are capable of Swarming,
  - (b) If conducting tethered operations; Adhere to noise limits, Height limits, and requirements for remote identification and geo-awareness Systems and additional requirements,
  - (c) Are capable of being armed,
  - (d) Are capable of carrying / transporting dangerous Cargo,
  - (e) Are capable of Dropping of materiel,
  - (f) Can carry people, and
  - (g) Are capable of autonomous operations, with procedures covering the activities the RP is not directly controlling (including unplanned emergency conditions such as Lost link profiles).
- (3) Are determined by the MAA to have residual RtL that is too great unless the UAS has undergone Certification, based on a combination of: MTOW, UA size, VLOS / BVLOS operation, overflight of people, airspace integration and classification, Detect and Avoid, etc.

# Regulation 1600(1)

# **Uncrewed Air System Categorization**

1600(1) All UK military registered UAS **shall** be categorized.

# Acceptable Means of Compliance 1600(1)

### **Uncrewed Air System Categorization**

- 6. Prior to operations commencing, the operating organizations / Type Airworthiness Authorities (TAAs) **should** ensure that the UAS are categorized into one of the following: Open A1, Open A2, Open A3, Specific S1, Specific S2 sub-categories or Certified Category.
- 7. Categorization Submissions **should not** be submitted for UAS intended to be operated by Contractor Flying Approved Organization Scheme (Basic UAS) (CFAOS (BU)) Defence Contractor Flying Organizations (under a UAS AM) in the Open Category and Specific S1 sub-category (ie in the Civilian Operated (In-Service), Civilian Operated (Development) and / or Special Case Flying DAE Operating Categories)<sup>25</sup>.
- 8. **Responsibility for UAS Categorization**. Once an organization recognizes the need to categorize a UAS it intends to operate, an appropriate person within the organization **should** accept Responsibility for completing the MAA Categorization Submission as follows:

<sup>&</sup>lt;sup>24</sup> Refer to RA 2320 – Flight Procedures: Role Specific S2 and Certified Remotely Piloted Air Systems

<sup>&</sup>lt;sup>25</sup> Categorization of UAS operated under the CFAOS (BU) will be achieved / accomplished via the CFAOS (BU) Approval process iaw RA 1031 – Contractor Flying Approved Organization Scheme (Basic Uncrewed Air Systems).

# Acceptable Means of Compliance 1600(1)

- a. **Open Category and Specific S1 sub-category.** The UAS RO / UAS AM **should** be responsible for submitting a Categorization Submission<sup>26</sup> to the MAA<sup>27, 28</sup>.
- b. **Specific S2 sub-category.** The TAA<sup>29</sup> (with Aviation Duty Holder (ADH) / Accountable Manager (Military Flying) (AM(MF)) / Senior Responsible Owner (SRO) endorsement<sup>30</sup>) or the AM(MF) only<sup>31</sup> **should** be responsible for submitting the Categorization Submission to the MAA<sup>27</sup>.
- c. **Certified Category.** The TAA (with ADH / AM(MF) / SRO endorsement), or the AM(MF) only, **should** be responsible for submitting the Categorization Submission to the MAA<sup>27</sup>.
- 9. **Categorization Submission**. Submitting personnel (UAS ROs and / or TAAs) **should** ensure that cases for Categorization are based on the operating Risk (which includes, but is not limited to: MTOW, dimensions, and speed of the remote air vehicle; and the nature of the proposed operations, including the range from the RP and the airspace).
- 10. The UAS RO / UAS AM **should** ensure that Open Category and Specific S1 sub-category Categorization Submissions provide detail to allocate a Category, identifying processes and aggravating factors coupled with mitigations that contribute to both the Safe to Operate and Operate Safely arguments. Open Category and Specific S1 sub-category Categorization Submission information, **should** as a minimum include:
  - a. A statement detailing why the UAS belong in the proposed UAS Category and sub-category (Open A1, Open A2, Open A3, or Specific S1).
  - b. The applicable information as detailed within the Categorization Safety Checklist at RA 1600 Annex B.
- 11. The TAA **should** ensure that Specific S2 sub-category and Certified Category Categorization Submissions provide detail of the proposed regulatory governance construct the UAS will follow for MAA agreement, including substantiated arguments for any requested derogations from the MRP. Specific S2 sub-category and Certified Category Categorization Submissions **should** as a minimum include:
  - a. A statement detailing why the UAS belongs in the proposed UAS Category and sub-category (Specific S2 or Certified).
  - b. A technical description of the UAS<sup>32</sup>.
  - c. A description of the organization's operating intent and environment, including an overview of any Test and Evaluation (T&E) objectives and strategies where applicable.
  - d. The aggravating and / or mitigating factors affecting or likely to affect the proposed UAS Category and sub-category.
  - e. Key stakeholders' details (eg ADH / AM(MF), TAA, etc).
  - f. A proposed Safety Target<sup>33, 34</sup>.

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<sup>&</sup>lt;sup>26</sup> The Categorization Submission is in place of the Release To Service (RTS) / Military Permit To Fly (MPTF), the Air System Safety Case (ASSC), and the Application for Approval in Principle.

<sup>&</sup>lt;sup>27</sup> Contact via <u>DSA-MAA-MRPEnquiries@mod.gov.uk</u>

<sup>&</sup>lt;sup>28</sup> For organizations operating under a CFAOS (BU) Approval submission of a Categorization Safety Checklist is not required; this will be achieved / accomplished via the CFAOS (BU) Approval process (refer to paragraph 9c).

<sup>&</sup>lt;sup>29</sup> Where the Air System is not UK MOD-owned, Type Airworthiness (TAw) management regulatory Responsibility by either the TAA or Type Airworthiness Manager (TAM) needs to be agreed within the Sponsor's approved model; refer to RA 1162 – Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems. Dependant on the agreed delegation of TAw responsibilities TAM may be read in place of TAA as appropriate throughout this RA.

<sup>&</sup>lt;sup>30</sup> For UAS intended for embarked operations the Ship Platform Authority and Ship Duty Holder, where known, will be consulted and involved in the categorization process.

<sup>&</sup>lt;sup>31</sup> For UAS in the Special Case Flying operating category; Refer to RA 1163 – Air Safety Governance Arrangements for Special Case Flying Air Systems.

To include Make and Model if Commercial Off The Shelf, or a broad description if agreed already within the Concept, Assessment,
 Development, Manufacturing, In-Service, and Disposal cycle for the development of Air Systems.
 Refer to RA 1230 – Design Safety Targets.

<sup>&</sup>lt;sup>34</sup> Refer to the Remotely Piloted Air Systems Manual - Regulatory Process, Categorization and Compliance.

# Acceptable Means of Compliance 1600(1)

- g. A draft Type Airworthiness Strategy (TAwS)<sup>35, 36</sup>.
- h. Details of any dangerous Cargo to be carried / transported and the procedures required.
- i. A statement detailing which MAA RAs are considered not applicable in the context of the Categorization Submission, or where an Alternative AMC approach is required to meet the intent. Each identified RA will be accompanied by a justification for the MAA to review.
- j. A statement that all Categorization Submission documentation has been reviewed and accepted by the TAA.
- k. A statement that all Categorization Submission documentation has been reviewed and accepted by the ADH / AM(MF).
- I. Approach to RTS Recommendations (RTSR) / MPTF Recommendation or MPTF (Development).
- m. Detail of any proposed kinetic, directed energy weapons or other effectors intended to alter target properties, to include munition type and deployment method<sup>37</sup>.
- n. Strategy for Approval of any ordnance and how its interaction / integration with the UAS will be safely managed (refer to the Defence Ordnance, Munitions and Explosives Safety Regulator).
- o. Planned operating areas when armed and unarmed (for example, designated aviation Danger Areas and / or Ranges)<sup>1, 38</sup>.
- p. Any derogations (a list of example derogations is detailed in the UAS Manual) being applied for supported by a Safety claim, argument, and evidence; culminating in a coherent and robust Safety Assessment<sup>39</sup>.
- 12. Organizations **should** submit a Categorization Submission to the MAA<sup>27</sup>. Organizations planning on submitting a Categorization Submission **should** contact the MAA at the earliest opportunity to discuss intent and operation.

Note:

Following receipt of the completed UAS Categorization Submission; the MAA will form a Categorization Panel and either issue an LEC<sup>40</sup> or reject the submission. An LEC will need to be issued prior to first flight.

- 13. For Open Category and Specific S1 sub-category UAS, the UAS RO / UAS AM **should** ensure the conditions specified in the LEC remains extant. These LECs **should** remain valid for a maximum of 24 months, provided the conditions specified in the LEC remain extant.
- 14. For Specific S2 sub-category and Certified Category UAS, the TAA **should** ensure the conditions specified in the LEC remains extant. These LECs **should** remain valid for the duration of the organization's UAS operations provided the conditions specified in the LEC remain extant.
- 15. Where an operating organization / TAA wishes to expand beyond the conditions specified in the LEC, including changes to the equipment, operating intent, or operating environment:
  - a. The organization<sup>41</sup> **should** resubmit the Categorization Submission and an associated Safety argument to the MAA<sup>21</sup>, noting that the updated Category and / or sub-category may be different to that previously endorsed.

<sup>&</sup>lt;sup>35</sup> Refer to RA 5010 – Type Airworthiness Strategy.

<sup>&</sup>lt;sup>36</sup> The draft TAwS will need to be completed and signed prior to first flight.

<sup>&</sup>lt;sup>37</sup> Only required for UAS designed or intended to be armed.

<sup>&</sup>lt;sup>38</sup> Refer to DSA 03.OME Part 3 (Formerly JSP 403 Volume 2) - Defence Code of Practice (DCOP) for Ranges.

<sup>&</sup>lt;sup>39</sup> Following LEC issue, requests for Alternative Acceptable Means of Compliances, Waivers or Exemptions to the MRP has to be formally applied for (iaw MAA03) and authorized by the MAA.

<sup>&</sup>lt;sup>40</sup> For UAS operated under the CFAOS (BU), the CFAOS (BU) Approval Certificate together with the referenced Contractor Flying Organization Exposition (BU) will satisfy the requirement of the LEC (ie an LEC will not be issued).

<sup>&</sup>lt;sup>41</sup> Except for organizations operating under a CFAOS (BU) Approval (refer to paragraph 9c).

# Acceptable Means of Compliance 1600(1)

- b. A new LEC **should** be in place prior to any operation under the new conditions<sup>41</sup>.
- c. For new organizations and / or use cases for Specific S2 sub-category UAS, the ASSC (Live) / ASSC (Development), and RTSR<sup>42</sup> / MPTF (In-Service) Recommendation<sup>43</sup> **should** be re-submitted to the MAA<sup>27</sup> for review.
- d. If a requirement is identified for a UAS being operated in the Open Category / Specific S1 sub-category to be operated outside its extant LEC for a specific operational requirement, the UAS RO **should** submit a request for an SPC to the MAA.
- 16. Organizations<sup>44</sup> with an extant Open Category or Specific S1 sub-category LEC wishing to add or remove different UAS models **should** submit an Appendix 1 to the Categorization Safety Checklist at RA 1600 Annex B. UAS ROs **should** only submit Appendix 1 submissions if no changes have been made to the original endorsed Safety Checklist RA 1600 Annex B.
- 17. For Certified Category UAS, further LEC applications **should not** be submitted following completion of initial Certification activity iaw RA 5810<sup>45</sup>. The full MRP will apply and further LEC submissions provide no additional benefit.
- 18. Development activity (including T&E, trials, and experimentation) **should** only be approved and undertaken by T&E endorsed organizations and SQEP<sup>46</sup>.
- 19. **UK MAR Requirements.** UAS ROs / UAS AMs / SROs **should** ensure that UAS are registered on, and when required de-registered from, the UK MAR. For Open Category and Specific S1 sub-category UAS, application for UK MAR registration is implicit in the Categorization Submission or CFAOS (BU) application and there is no requirement to submit a separate application. TAAs / SROs **should** ensure that Specific S2 sub-category and Certified Category UAS comply with the RA 1161<sup>47</sup> requirements.
- 20. **First Person View (FPV) UAS Operations.** The Categorization Submission **should** note the different operating parameters. The use of FPV seriously limits the operators' wider airspace understanding. The use of a UAS Observer **should** be included in the submission to maintain situational awareness, or an acceptable alternative will need to be proposed. The use of FPV UAS has been demonstrated as an effective method in asymmetric warfighting. To support effective training FPV UAS may be permitted to conduct CFIT under an SPC if the criteria governing SPCs is met.

# Guidance Material 1600(1)

### **Uncrewed Air System Categorization**

- 21. Civil Registered, Military Operated UAS are regulated by RA 116648.
- 22. Defence personnel involved in the Development and procurement of UASs must comply with 2025DIN04-053<sup>49</sup>.
- 23. Defence personnel involved in the Development and procurement of UASs must ensure the frequency Allocation process and considerations are complete, via the Defence Electromagnetic Authority annex within JSP 453<sup>50</sup>, prior to purchasing and using UAS.
- 24. Early engagement with the MAA is encouraged to reduce impact on project timelines. Engagement will ideally be during the equipment assessment phase (or earlier if possible) to enable the Categorization Submission to be submitted no later than Full Business Case to ensure that the correct Certification and regulatory regime can be adopted.

<sup>&</sup>lt;sup>42</sup> Refer to RA 1300 - Release To Service.

<sup>&</sup>lt;sup>43</sup> Refer to RA 1305 – Military Permit To Fly (In-Service), (Special Case Flying) and (Single Task).

<sup>&</sup>lt;sup>44</sup> Except for organizations operating under a CFAOS (BU) Approval, who **should** follow the procedures as per RA 1031.

<sup>&</sup>lt;sup>45</sup> Refer to RA 5810 - Military Type Certificate (MRP Part 21 Subpart B).

<sup>&</sup>lt;sup>46</sup> Refer to RA 2370 – Test and Evaluation.

<sup>&</sup>lt;sup>47</sup> Refer to RA 1161 – Military Registration of Aircraft Operating within the Defence Air Environment.

<sup>&</sup>lt;sup>48</sup> Refer to RA 1166 – UK Civil-Registered Aircraft Utilized by the Ministry of Defence.

<sup>&</sup>lt;sup>49</sup> Refer to 2025DIN04-053 – Defence Uncrewed Systems Design Authority (DUxDA) Development and Procurement of Uncrewed Systems.

<sup>&</sup>lt;sup>50′</sup>Refer to JSP 453 – Digital Policies and Standards for Defence, Chapter 4 – Operations, Annex – Defence Electromagnetic Authority (DEMA) Standard.

# Guidance Material 1600(1)

- 25. It is important that an organization wishing to bring a UAS into Service within the DAE fully understands the extent of its proposed usage in so far as is practicable throughout the life of the Air System, in order that an appropriate UAS can be acquired from the outset (future-proofing). Changes to the requirements once In-Service will require re-assessment of the Categorization which may lead to the categorized UAS not being suitable for the revised operating intent and / or conditions.
- 26. Selection of the correct UAS is dependent on the intended Concept of Use (CONUSE) and Concept of Employment. Organizations can refer to RA 1600 Annex A, Figure 1 to assist in determining appropriate UAS categories and physical attributes from the outset.
- 27. The procurement of UAS to be operated in the Open Category or Specific S1 sub-category is likely to be undertaken outside of the DE&S procurement process, by organizations with minimal UAS experience. DE&S UAS Delivery Team (DT), CATALYST DT or DE&S Airworthiness Team (DAT) are able to provide guidance on the procurement of such UAS. Whilst the Strat Com Integration Design Authority, DUxDA can provide Advice on the Acquisition of such Systems.
- 28. The Categorization Safety Checklist at RA 1600 Annex B provides a list of topics to be considered in the cases for Open Category and Specific S1 sub-category Categorization<sup>51</sup>. However, it is recognized that minimal detail may be available when a Categorization Submission is made during the UAS Concept phase. Nonetheless, it is in the best interests of the submitting organization to include as much detail as is available. This will, in turn, enable the MAA to make the best-informed UAS Category assessment.
- 29. The MAA recognizes that the full suite of Artefacts and evidence for Specific S2 sub-category and Certified Category UAS may not be available to fully support the Categorization Submission and that ASSC and RTS / MPTF review will be completed prior to commencement of flight.
- 30. Where UAS will be operated in the maritime environment (ie embarked aviation), the Ship's Platform Authority and Ship Duty Holder are likely to be essential in the provision of Subject Matter Expertise for the Categorization Submission<sup>52</sup>. The UAS categorization<sup>51</sup> needs to be reviewed to ensure the original UAS categorization remains accurate, or requires a re-categorization, with a change in CONUSE / Concept of Operations if used in maritime environment.
- 31. The MAA may categorize UAS into a different Category than that submitted if deemed appropriate.
- 32. The MAA will form a UAS Categorization Panel chaired by an Authorizing Officer to review the Categorization Submission. It is expected that the MAA Categorization process, from receipt of the Categorization Submission to issuance of an LEC or provisional Categorization response, will be no longer than 60 working days<sup>53</sup>. Where the MAA has to request further information from the submitting organization to inform the Categorization decision, the response may be delayed.
- 33. The Specific S1 sub-category represents the greatest RtL that a UAS RO or UAS AM can manage. The RtL is bounded through the LEC or CFAOS (BU) Approval respectively. Elevation of Risk beyond this point requires entry into Specific S2 subcategory or Certified Category, and an ADH chain or AM(MF).
- 34. Any re-Categorization may require additional MRP compliance including Certification, Continuing Airworthiness management, etc. Therefore, organizations may wish to seek initial Categorization in an appropriate Category if they envisage operating intent and / or conditions being expanded later.
- 35. UAS operating in the Open and S1 sub-categories do not require a RTS / MPTF. UAS operating in the S2 sub-category and Certified Category require an RTS /

<sup>&</sup>lt;sup>51</sup> For organizations operating under a CFAOS (BU) Approval this will be achieved / accomplished via the CFAOS (BU) Approval process (refer to paragraph 9c)

process (refer to paragraph 9c).
<sup>52</sup> Refer to RA 1029 – Ship Air-Release - Roles and Responsibilities; and RA 1395(5): Ship Air-Release Uncrewed Air Systems.

<sup>&</sup>lt;sup>53</sup> Refer to RA 1031 for more details on CFAOS (BU) Approvals timescale: typically 3 to 6 months.

# Guidance Material 1600(1)

MPTF. There may be a requirement to have an MPTF (Development)<sup>54</sup> for T&E activities.

36. Flying Displays, Display Flying, Display Parachuting, Role Demonstrations and Flypasts. Flying Displays, Display Flying, Display Parachuting, Role Demonstrations and Flypasts will be planned, managed, organized, and delivered iaw RA 2335<sup>55</sup>.

# Regulation 1600(2)

Remotely Piloted Air System Regulatory Requirements 1600(2) Withdrawn – Incorporated into RA 1600(1).

# Acceptable Means of Compliance 1600(2)

### Remotely Piloted Air System Regulatory Requirements

37. Withdrawn – Incorporated into RA 1600(1).

# Guidance Material 1600(2)

Remotely Piloted Air System Regulatory Requirements

38. Withdrawn – Incorporated into RA 1600(1).

5.

<sup>&</sup>lt;sup>54</sup> Refer to RA 5880 – Military Permit to Fly (Development) (MRP Part 21 Subpart P) for further information on MPTF (Development).

<sup>&</sup>lt;sup>55</sup> Refer to RA 2335 – Flying Displays, Display Flying, Display Parachuting, Role Demonstrations and Flypasts.

#### Annex A

Figure 1 – Categorization Schematic (for illustrative purposes only – see RAs for definitive applicability)

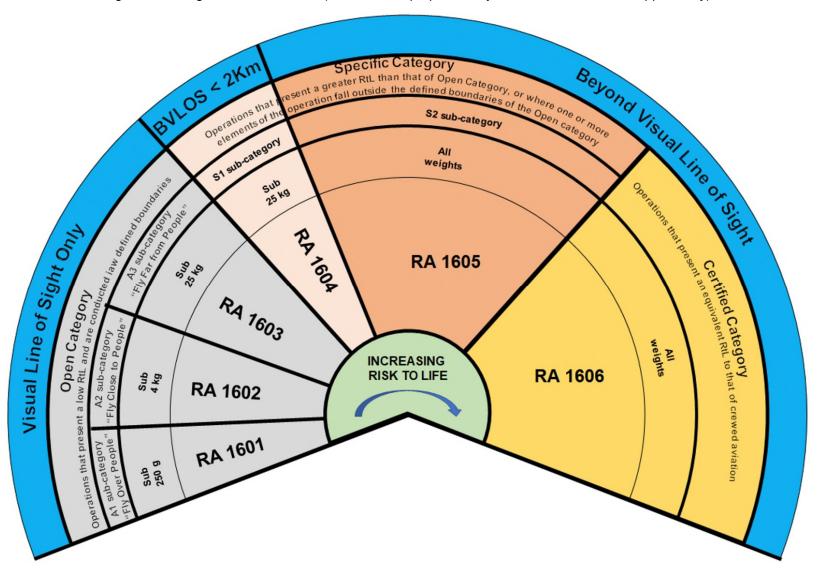


Table 1 – Requirements for operating an Uncrewed Air System

			Open			Specific		
		A1	A2 A3		<b>S</b> 1	S2	Certified	
Mandatory requirements	MTOW	Less than 250 g	Less than 4 kg	Less than 25 kg	Less than 25 kg	Any weight	Any weight	
	Distance from RP	VLOS	VLOS	VLOS	BVLOS (up to 2,000 m)	Any	Any	
	Horizontal distance from Uninvolved Persons	Any	Minimum 30 m (or minimum 5 m if a 'low speed mode' is equipped and selected)	Minimum 50 m	Any	Any	Any	
	Horizontal distance from Congested Areas	Yes	Not within 50 m	Not within 50 m	Yes	Yes	Yes	
	Operated over Areas of high population density	No	No	No	No	Yes	Yes	
	Height	No greater than 120 m (400 ft)	No greater than 120 m (400 ft)	No greater than 120 m (400 ft)	No greater than detailed within manufacturers guidelines	Any	Any	
	UK / EU conformity marking (or be designed to similar standards)	CO	C0 – C2	C0 – C4	C0 – C4	C0 – C6	C0 – C6	
	Maximum speed	Any	Any	Any	Any	Any	Any	
	UK MAR registration	By type	By type	By type	By type	By type or tail (as detailed in RA 1161)	By tail	
	Military Aircraft Registration No. (displayed on the main fuselage)	Yes (and unit identifier)	Yes (and unit identifier)	Yes (and unit identifier)	Yes (and unit identifier) or local UAS serial no.	If registered by tail – Yes If registered by type – Yes (and unit identifier)	Yes	
	Operate under DAE Operating Framework	Yes	Yes	Yes	Yes	Yes	Yes	

		Open			Spe	Certified		
		A1	A2	A3	<b>S</b> 1	S2	Certified	
	Assigned a DAE Operating Category	Yes	Yes	Yes	Yes	Yes	Yes	
	Segregated Airspace usage	No	No	No	Yes	Yes (iaw RA 2320, when BVLOS and within the UK FIR)	Yes (iaw RA 2320 (but not if the UAS is able to Detect and Avoid during Lost link profiles))	
	Swarming	Yes	Yes	Yes	Yes	Yes	Yes	
	Tethered flight	Yes	Yes	Yes	Yes	Yes	Yes	
requirements	Armed	Yes (only where an SPC has been endorsed by the MAA)	Yes (only where an SPC has been endorsed by the MAA)	Yes (only where an SPC has been endorsed by the MAA)	Yes (only where an SPC has been endorsed by the MAA)	Yes (only where an SPC has been endorsed by the MAA)	Yes	
	Dangerous Cargo (carry / transport)	Yes	Yes	Yes	Yes	Yes	Yes	
Optional	Dropping of materiel	Yes	Yes	Yes	Yes	Yes	Yes	
o	Autonomous operation	Yes	Yes	Yes	Yes	Yes	Yes	
	Carrying people	No	No	No	No	No	Yes	

Table 2 - People / Organizations required for operating an Uncrewed Air System

	Open			Sp	O and Const.	
	A1	A2	A3	<b>S</b> 1	S2	Certified
Capability Owner	No	Yes (min OF5 or equivalent)	Yes (min OF5 or equivalent)	Yes (min OF5 or equivalent)	No	No
Sponsor	Yes	Yes	Yes	Yes	Yes	Yes
UAS RO	Yes (min OF2 or equivalent)	Yes (min OF4 or equivalent)	Yes (min OF4 or equivalent)	Yes (min OF4 or equivalent)	No	No
UAS AM	Yes	Yes	Yes	Yes	No	No
ADH	No	No	No	No	Yes	Yes
AM(MF)	No	No	No	No	Yes	Yes
Senior Operator (SO)	No	Yes	Yes	Yes	Yes	Yes
Flight Operations Post Holder	No	Yes	Yes	Yes	Yes	Yes
TAA	No	No	No	No	Yes (MTOW ≥ 150 kg = OF5 or equivalent) (MTOW < 150 kg = OF4 or equivalent)	Yes
Continuing Airworthiness Management Organization	No	No	No	No	Yes	Yes
Chief Air Engineer	No	No	No	No	Yes	Yes
SRO	No	No	No	No	Yes	Yes

Table 3 – Paperwork required for operating an Uncrewed Air System

	Open			Specific		O a will a d
	A1	A2	A3	S1	S2 <sup>56</sup>	Certified
RA 1600 Annex B	Yes	Yes	Yes	Yes	No	No
SPC (optional to operate outside LEC limitations)	Yes	Yes	Yes	Yes	No	No
Manufacturer's User or Op Manual	Yes	Yes	Yes	Yes	Yes	No
Application for Approval in Principle	No	No	No	No	Yes	Yes
Type Airworthiness Strategy	No	No	No	No	Yes	Yes
Certificate of Design	No	No	No	No	Yes	Yes
Proposed / Agreed / Design Safety Targets	No	No	No	No	Yes	Yes
RTS / MPTF	No	No	No	No	Yes	Yes
ASSC	No	No	No	No	Yes	Yes
Ageing Air System Audit	No	No	No	No (if Service Life < 6 yrs)	Yes	Yes
Integrity Mgmt	No	No	No	No	Yes	Yes
Military Airworthiness Review Certificate	No	No	No	No	Yes	Yes
Design Approved Organization Scheme	No	No	No	No	Yes	Yes
Maintenance Approved Organization Scheme	No	No	No	No	Yes	Yes
Software Assurance	Yes	Yes	Yes	Yes	Yes	Yes
Configuration Management Plan	No	No	No	No	Yes	Yes

<sup>&</sup>lt;sup>56</sup> All paperwork listed as being required, for Specific S2 sub-category UAS, are required unless there is an MAA approved derogation (iaw the UAS Manual).

#### Annex B

#### Categorization Safety Checklist57

The Categorization Safety Checklist provides recommended headings and content to be considered for inclusion in the submission for Open Category and Specific S1 sub-category UAS Categorization. It is recognized that some of the content detailed below might not be available at the time the Categorization Submission is prepared. Nonetheless, it is in the best interests of the submitting organization to include as much information as available to inform the MAA Categorization.

## 1. Organization

{Full details of the organization that is subject to the submission – all areas detailed below ought to be covered as a minimum. Where examples are given, they are not exhaustive}

- 1.1. Structure of organization and management {Brief description}
- 1.2. Key personnel

{As appropriate, eg UAS RO, UAS AM. Aviation qualifications and experience to be included if applicable}

- 1.3. Responsibility and duties of the RP {Expected duties of the RP}
- 1.4. Responsibility and duties of support personnel in the operation of the UAS {eg RPs might use an assistant to help with the operation of the UA. Give a brief description of this person's responsibilities and duties}
- 1.5. Flight team composition {Composition of the flight team according to nature of operation, complexity, type of UA, etc}
- 1.6. Operation of multiple types of UAS {Detail any limitations to the numbers and types of UAS that a RP might operate if appropriate}
- 1.7. Qualification requirements

{Details of the qualifications, experience or training necessary for the RP or support crew according to the types of UAS and roles employed by the RP}

- 1.8. Crew health
  - {A statement and any guidance to ensure that the crew are appropriately fit before conducting any operations}
- 1.9. Logs and records

{Requirements for logs and records of flights for the UAS and by the RP}

1.10. Details of the RP training programme

{Training and checking requirements for RPs and support crew as determined by the UAS RO / UAS AM to cover initial, refresher and conversion syllabi. Include any independent assessment of RP Competency and currency requirements}

- 1.11. Occurrence prevention, Occurrence reporting, and Flight Safety programme {Include any reporting requirements and interface with Safety Management System}
- 1.12. Change Management (Modifications)

{Detail how the organization manages changes to the original design}

1.13. Repair and servicing

{Describe the Repair and servicing process used by the unit}

1.14. Other documents

{As considered necessary - copies of any documents ought to be attached}

#### 2. Operations

{Details of the operating environment and procedures subject to the submission – all areas detailed below ought to be covered as a minimum. Where examples are given, they are not exhaustive}

<sup>&</sup>lt;sup>57</sup> For organizations operating under a CFAOS (BU) Approval submission of a Categorization Safety Checklist is not required; this will be achieved / accomplished via the CFAOS (BU) Approval process (refer to paragraph 10a).

#### 2.1. Operating Intent / Types of operation

{Detail nature of operation (eg VLOS / BVLOS, flexible / dynamic tasking, day / Night, weather, operating behaviour, etc)}

#### 2.2. Operating Areas

{Full detail of expected areas of geographic operations including operating areas (eg Congested Areas, open countryside, roads, etc). Consideration of overflown population density, suitability of launch and recovery locations and required services}

#### 2.3. Operating limitations, conditions, and related factors

{Minimum and maximum operating conditions and limitations; reference any applicable limitations document if available and / or applicable; maximum kinetic energy; MTOW; maximum speed<sup>58</sup>; population density}

2.4. Aggravating and / or mitigating factors table affecting or likely to affect the UAS Category or Categories.

#### 2.5. Dangerous Cargo

{Details of any dangerous Cargo to be carried / transported and the procedures required}

#### 2.6. Supervision of UAS operations

{A description of any system to supervise the operations of the RP}

#### 2.7. Operating site planning and assessment

{Airspace operating environment considerations and procedures (eg controlled or restricted airspace, local avoids and Hazards, electromagnetic environment, etc)}

#### 2.8. Communications

{Awareness and links with other users and Aircrew / RPs}

#### 2.9. Weather

{Consideration of UAS environmental limitations}

#### 2.10. On site procedures

- a. Site Survey {Methods of surveying operating area, identifying Hazards and any recorded Risk Assessment}
- b. Selection of operating area and alternate {Methods of identifying and selecting operating area and how the alternate would be kept clear}
- c. Crew briefing {Procedures to brief crew (eg task, responsibilities, duties, emergencies, etc)}
- d. Cordon Procedure (Adherence of separation criteria)
- e. Communications {Procedures to maintain contact with crew and adjacent air operations if appropriate}
- f. Weather Checks {Met brief provision, limitations and operating considerations}
- g. Refuelling {To include changing / charging of batteries}
- h. Loading of equipment {Detail procedures taken to ensure security of loaded equipment}

#### 2.11. Assembly and functional checks

{Checks conducted on completion of assembly of the system}

#### 2.12. Pre-flight checks

{Checks conducted immediately prior to flight}

#### 2.13. Flight Procedures

{Start, take-off, in-flight, landing, shutdown}

#### 2.14. Post-flight or between flight checks

{Detail the checks or inspections conducted both after flight and between flights, do appropriate Maintenance documents exist to return the Air System to a Serviceable state?}

#### 2.15. Emergency Procedures

{Include Lost link, flyaway, airspace encroachment, fire (UA and Command Unit), etc. Preventive

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<sup>&</sup>lt;sup>58</sup> As part of the Categorization Submission, to justify operations faster than 19 m/s (68.4 km/h / 42.5 mph), UAS ROs and UAS AMs are required to detail the DoC and RtL implications of kinetic impact at those speeds and the mitigations required to minimize fatalities.

measures ought to also be detailed, along with a list of alarms and associated instructions, etc. Preventive measures ought to also be detailed}

2.16. Surveillance of Operations {Surveillance methods for Verification of UAS geospatial positioning}

#### Annex B - Appendix 1

#### **Categorization Safety Checklist**

Technical descriptions and details of the UAS that is subject to the submission – all areas detailed below will need to be covered as a minimum. Where examples are given, they are not exhaustive.

#### 3. Systems

- 3.1. Details of Design Organization and manufacturer / Production Organization {The designer and manufacturer might be the same company, include details of any Approvals that such organizations hold}
- 3.2. Recognized standards, to which the equipment has been designed, built and tested {Details of any standards that might or might not be aviation related and might add to the Safety argument. Where known this ought to include test and evaluation evidence}
- 3.3. The designed flight envelope

{Full description of the flight envelope including: MTOW, flight duration, communications range, max Height and speeds to maintain safe flight and glide profile (where appropriate). Include effects on flight envelope of differing Payloads}

- 3.4. UA dimensions
  - {Full dimensions to be given including mass with and without fuel; with and without any Payloads, etc}
- 3.5. UA energy

{maximum speed (m/s), maximum kinetic energy (joules)}

3.6. Design features

{Detail the design features of the system, materials used, type of Structure, etc}

3.7. Software Assurance

{Detail the software version, and the steps taken to assure the software}

3.8. Construction

{Detail the build nature of each Air System and how structural strength is assured}

3.9. Electrical power and distribution

{Detail the electrical power and distribution, include battery type and number, generator specifications, equipment ratings, load shedding where appropriate, etc. This section will also consider any storage considerations related to batteries (eg on board ship)}

3.10. Propulsion System

{Detail the Propulsion System(s) used, power output, type of propeller / rotor, etc}

3.11. Fuel System

{Detail the fuel system arrangement, type of fuel, fuel delivery, etc}

3.12. Flight Management System and Flight Control System

{Detail of how the UA is controlled, control linkages, control rigging, include any automatic stabilisation, etc}

3.13. Navigation and Guidance

{Detail the system used for navigation and guidance, include any automatic piloting, telemetry, etc}

3.14. Other avionics

{Detail any other avionics fitted to the system}

3.15. Launch and Recovery

{Describe the launch and recovery Systems and detail any landing aids fitted to the system}

3.16. Payloads

{For each UA give a technical description of the Payload expected to be installed or carried}

3.17. Emergency recovery or Safety systems

{Detail any Systems fitted to the UA or Command Unit that contribute to safe flight or handling including their modes of operation (eg ballistic parachutes, propeller guards, independent flight termination, flight recovery system, etc)}

3.18. Modifications to the system

{Detail any Modifications that have been made post initial design}

#### 3.19. Command Unit

{Where a laptop / tablet is utilized give details of the type of operating system and other technical specifications. Give detail of process for firmware and software updates, and what flight parameters, commands, and data are recorded}

#### 3.20. Command and Control Link (C2)

{Describe the C2 infrastructure, how its integrity is monitored and the reaction of the system to degraded signal strengths}

#### 3.21. C2 Loss Prevention

{What design characteristics or procedures are in place to prevent and mitigate loss of data link whether due to Radio Frequency (RF) interference, equipment malfunctions (UA / Command Unit) or atmospheric conditions}

#### 3.22. Lost link

{Describe the UA lost data link logic, profile and management for all phases of flight}

#### 3.23. Whole system Single Points Of Failure (SPOF)

{For each element of the whole system, identify where SPOF might exist or alternatively where redundancy exists (eg motors, propellers, etc)}

# 3.24. Lifing, Maintenance schedules and inspections as applicable

{Describe the general Maintenance philosophy for the UA}

#### 3.25. Repair and servicing as applicable

{Where Repairs to the system are necessary, describe the Repair and servicing philosophy} {Specific requirements of the system will need to be detailed here}

#### 3.26. Known failure modes

{For the whole system identify known failure modes and detail preventive strategy}

#### 3.27. Failsafe features

{Detail any failsafe features in the design of the system}

# 3.28. Operating limitations and conditions (for Categorization phase only) as applicable {List the minimum and maximum operating conditions to highlight any mitigating or aggravating factors}

#### 3.29. Transportation requirements

{Detail how the system is transported between sites. Include all carry cases, transport description, etc}

#### 3.30. UK / EU Conformity Standard / Similar Standards {Detail the conformity standard of the UAS}

#### Annex B - Appendix 2

#### **Specific Purpose Clearance Checklist**

Units who currently hold, or are in the process of applying for an Open / Specific S1 LEC, or have an existing SPC may submit this appendix to seek additional operating clearances. All areas below will need to be covered as a minimum. Where examples are given, they are not exhaustive.

#### 4. Special Purpose Clearance Submission.

- 4.1 Details of the Operating Intent / additional clearance(s).
  {Please relate the request to the specific area of the Regulation that you require derogations from, including the MOD benefit in doing so (eg Operating Range)}
- 4.2 Operating Area(s).

{Detail the areas for operation including details of permissions where applicable}

- a. Airspace considerations.
  {Detail the airspace to be used, this will include details of how you will segregate airspace, provision of suitable surveillance of the operating area, communication methods between the Remote Pilot (RP) and the surveillance provider, a method for location of the Uncrewed Aircraft, methods of providing conspicuity to other air users (eg Automatic Dependent Surveillance Broadcast (ADS-B)), Methods for maintaining safe separation from other Air Systems.
- Ground considerations.
   {Details will be provided of any populated areas within the operating area(s) as well as suitable mitigation to prevent Risk to both involved and Uninvolved Persons. State any additional considerations towards Risk for involved persons}
- 4.3 Operating limitations, conditions, and related factors. {Minimum and maximum operating conditions and limitations; reference any applicable limitations document if available and / or applicable}
- 4.4 Systems you require to utilize for the additional permission(s) and their suitability.

  {Any system not on the LEC will also require Appendix 1 to Annex B to be submitted. For UAS already on the LEC their suitability will be derived from the Original Equipment Manufacturer}
- 4.5 Timeline for the clearance(s) to be applicable<sup>59</sup>.

  {For enduring timelines additional justification will be provided demonstrating an internal review and assessment process for the enduring validity of the clearance}
- 4.6 Independent Assurance Organization Identify the Competent organization(s) that are responsible for your aviation Assurance.
  {This is requested to provide a supporting Assurance Structure for all units wishing to apply for additional permissions.}
- 4.7 Training.
  {Detail additional SO / Flight Operations Post Holder / RP Instructor / RP training considerations detailed by the UAS RO / UAS AM that have been or will be undertaken to enable the activity covered in 4.1. If the individual is deemed suitably qualified and experienced, please evidence this}
- 4.8 Additional mitigations.
  {Highlight additional aggravating factors and their mitigations in support of the activity highlighted in 4.1. Demonstrate how the residual Risks remain As Low As Reasonably Practicable and Tolerable}

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<sup>&</sup>lt;sup>59</sup> Maximum of 24 months in line with the current validity of the LEC.

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