



## NOTICE OF PROPOSED AMENDMENT

### NPA 04/2017

## DEFENCE AVIATION SAFETY REGULATIONS FOR UNMANNED AIRCRAFT SYSTEMS (DASR UAS)

### INTRODUCTION

#### Applicability

1. This Notice of Proposed Amendment (NPA) is applicable to all members of the Defence aviation community involved or interested in UAS operations.

#### Purpose

2. The purpose of this NPA is to seek feedback from the Defence aviation community on the proposed DASR UAS at Annex A, with the intent of formally releasing the regulations in December 2017.

#### Background

3. Current DASR UAS were released on 30 Sep 16 as a transitional arrangement to coincide with the release of DASR. This NPA introduces new DASR UAS which:

- a. represent an update to the transitional arrangement
- b. partially align with European Aviation Safety Agency (EASA) regulations, to promote commonality with an emerging global convention, and with the aim of future compatibility with European Military Airworthiness Requirements (EMAR)
- c. partially align with Civil Aviation Safety Authority (CASA) regulations, to promote commonality in Australian civil and military UAS regulations
- d. provide operators with a defensible safety framework based on contemporary regulations
- e. adopt a risk based approach to Authority involvement in order to enable UAS operators to rapidly introduce new capabilities to service
- f. provide improved clarity on the roles of Authority and UAS operators, thereby promoting compatibility with Australian Work Health and Safety Act 2011.

### HOW TO SUBMIT COMMENTS ON THIS NPA

#### Format

4. Responses to this NPA are to be recorded on the NPA Response Sheet included at Annex B.
5. Responses are to be submitted to DASA by email to [ACPA.Reggs@defence.gov.au](mailto:ACPA.Reggs@defence.gov.au). Hardcopies of the NPA Comment Sheet are not required.

#### Timing

6. Comments to this NPA are to be forwarded by close of business 15 November 2017.

**Additional Information**

7. Additional information on this NPA is available from WGCDR Phil Sixsmith who can be contacted on (02) 6128 7493 or [phil.sixsmith@defence.gov.au](mailto:phil.sixsmith@defence.gov.au).

**DISPOSITION OF RESPONSES RECEIVED**

8. A Summary of Responses will be prepared and published on the [DASA Website](#). DASA will not individually acknowledge or respond to comments or submissions.

Original Signed  
24 October 2017

**P.R. SIXSMITH**

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Defence Aviation Safety Authority  
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**Annex:**

- A. NPA 04/2017 – Proposed Regulations
- B. NPA 04/2017 – Response Sheet

## NPA 04/2017 – PROPOSED REGULATIONS

# DEFENCE AVIATION SAFETY REGULATIONS FOR UNMANNED AIRCRAFT SYSTEMS (DASR UAS)

### IR – Air Operations

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#### UAS.10 – UAS APPROVAL AND AUTHORISATION

**UAS.10(a)** Defence UAS shall only be operated if authorised by the relevant Command or Defence Group.

**UAS.10(b)** Persons Authorising, and Operators of, a UAS are:

1. to eliminate risk to health and safety, so far as is reasonably practicable, to other air users, and to personnel and critical infrastructure on the ground or water, and
2. if it is not reasonably practicable to eliminate risk to health and safety, to minimise those risks so far as is reasonably practicable.

**UAS.10(c)** All Defence UAS shall operate in accordance with the requirements and limitations of Certified, Specific or Open category.

#### UAS.20 – CERTIFIED CATEGORY UAS

**UAS.20(a)** UAS shall only be eligible for operation under Certified category if they:

1. are Defence registered
2. have a SOIU in accordance with DASR ARO.50
3. are type-certificated in accordance with DASR 21
4. comply with all initial and continuing airworthiness DASR
5. are operated under a MAOC in accordance with DASR ARO.100
6. comply with DASR Air Operations and Standard Rules of the Air
7. are controlled by a remote pilot who is a qualified military pilot, or qualified in accordance with requirements mandated by COMAUSFLT/COMD FORCOMD/ACAUST.

**UAS.30 – SPECIFIC CATEGORY UAS**

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**UAS.30(a)** UAS shall only be eligible for operation under Specific category if they are operated under either:

1. a UASOP issued by the Authority (Specific Type A), or
2. a Standard Scenario published by the Authority (Specific Type B).

**UAS.30(b)** Specific category UAS to be operated under a UASOP (Specific Type A) shall:

1. be Defence registered when directed by the Authority
2. have its role and operating environment documented in an SOIU when directed by the Authority
3. comply with DASR initial and continuing airworthiness regulations to the extent directed by the Authority
4. comply with the Military Air Operator requirements of DASR ARO.100, to the extent directed by the Authority
5. comply with DASR under Air Operations and Standard Rules of the Air to the extent directed by the Authority
6. be controlled by a remote pilot who is qualified as specified in the UASOP
7. operate within the requirements and limitations included on the UASOP.

**UAS.30(c)** Specific category UAS to be operated under a Standard Scenario (Specific Type B) shall:

1. be operated only under Standard Scenarios at DASR UAS.35
2. be notified to the Authority prior to commencement of operations.

**UAS.35 – STANDARD SCENARIOS FOR UAS OPERATIONS**

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**UAS.35(a)** Standard Scenario for Micro UAS. UAS operations under the Micro UAS Standard Scenario shall comply with the following requirements and limitations:

1. UAS MTOW must not exceed 0.1 kg.
2. Not operate in a Prohibited Area.
3. Not operate in a Restricted Area unless approved by the authority controlling the area.
4. Not operate in such a manner as to create an obstruction to another aircraft.
5. Not operate over an aerodrome runway/movement area without approval from the relevant authority.
6. Not operate in the approach or departure path of a runway, landing area or ship without approval from the relevant authority.
7. Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.
8. Allow remote pilot intervention during all stages of the flight.
9. Employ suitable risk controls for operating:
  - (1) beyond visual line of sight

- (2) outside of daylight hours
- (3) in cloud or reduced visibility
- (4) above 400 ft AGL.

**UAS.35(b) Standard Scenario for Very Small UAS. UAS operations under the Very Small UAS Standard Scenario shall comply with the following requirements and limitations:**

1. UAS MTOW must not exceed 2 kg.
2. Not operate in a Prohibited Area.
3. Not operate in a Restricted Area unless approved by the authority controlling the area.
4. Not operate over an area where a fire, police or other public safety or emergency operation is being conducted without the approval of the person in charge of the operation.
5. Not operate in such a manner as to create an obstruction to another aircraft.
6. Not operate in controlled airspace higher than 400 ft AGL without approval of the relevant airspace authority.
7. Not operate over an aerodrome runway/movement area without approval from the relevant authority.
8. Not operate in the approach or departure path of a runway, landing area or ship without approval from the relevant authority.
9. Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.
10. For each air vehicle, have a dedicated remote pilot.
11. Allow remote pilot intervention during all stages of the flight.
12. Employ suitable risk controls for operating:
  - (1) beyond visual line of sight
  - (2) outside of daylight hours
  - (3) in cloud or reduced visibility
  - (4) above 400 ft AGL
  - (5) within 30 m horizontally of GP
  - (6) over populous areas
  - (7) over or in proximity of critical infrastructure
  - (8) within 3 nm of the movement area of a controlled aerodrome.

**UAS.35(c) Standard Scenario for Defence Ranges and Exercise Areas. UAS operations under the Defence Ranges and Exercise Areas Standard Scenario shall comply with the following requirements and limitations:**

1. Operate only in active (permanently or NOTAM) Restricted airspace that enables the exclusion of civilian aircraft from the area of operation. Restricted airspace may only be entered with approval of the relevant authority.
2. Operate only over Defence Controlled Land that excludes GP, or permits the UAS operator to ensure operations are not in the proximity of GP, or over water designated for a planned Defence exercise only during that exercise period.
3. UAS MTOW must not exceed 150 kg.
4. Not operate in a Prohibited Area.
5. Not operate over an area where a fire, police or other public safety or emergency operation is being conducted without the approval of the person in charge of the operation.
6. Not operate in such a manner as to create an obstruction to another aircraft.
7. Not operate over an aerodrome runway/movement area without approval from the relevant authority.
8. Not operate in the approach or departure path of a runway, landing area or ship without approval from the relevant authority.
9. Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.
10. For each air vehicle, have a dedicated remote pilot.
11. Allow remote pilot intervention during all stages of the flight.
12. Employ suitable risk controls for operating:
  - (1) beyond visual line of sight
  - (2) outside of daylight hours
  - (3) in cloud or reduced visibility
  - (4) above 400 ft AGL
  - (5) over or in proximity of MEP
  - (6) over or in proximity of vessels in the exercise area
  - (7) over or in proximity of critical infrastructure.

**UAS.35(d) Standard Scenario for High Seas. UAS operations under the High Seas Standard Scenario shall comply with the following requirements and limitations:**

1. Operate no closer than 12 nm to land; except operations within 12 nm of rocks, shoals, and islands which have no permanent human inhabitants is permitted.
2. UAS MTOW must not exceed 150 kg.
3. Not operate in a Prohibited Area.
4. Not operate in a Restricted Area unless approved by the authority controlling the area.

5. **Not operate over an area where a fire, police or other public safety or emergency operation is being conducted without the approval of the person in charge of the operation.**
6. **Not operate in such a manner as to create an obstruction to another aircraft.**
7. **Not operate in controlled airspace higher than 400 ft AMSL without approval of the relevant airspace authority.**
8. **Not operate in the approach or departure path of a ship's runway/landing area without approval from the relevant authority.**
9. **Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.**
10. **For each air vehicle, have a dedicated remote pilot.**
11. **Allow remote pilot intervention during all stages of the flight.**
12. **Employ suitable risk controls for operating:**
  - (1) **beyond visual line of sight**
  - (2) **outside of daylight hours**
  - (3) **in cloud or reduced visibility**
  - (4) **above 400 ft AMSL**
  - (5) **over or in proximity of MEP**
  - (6) **over or in proximity of vessels**
  - (7) **over or in proximity of critical infrastructure.**

**UAS.35(e) Standard Scenario for Trials and Experimentation. UAS operations under the Trials and Experimentation Standard Scenario shall comply with the following requirements and limitations:**

1. **Operate only in a Restricted Area that enables the exclusion of civilian and military aircraft operation, except those specifically planned as part of the trial.**
2. **Operate only over Defence Controlled Land, that excludes GP from entering the UAS area of operation, or over water where the UAS is not in the proximity of, or overhead of, GP.**
3. **Not operate in a Prohibited Area.**
4. **Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.**
5. **Allow remote pilot intervention during all stages of the flight.**
6. **Employ suitable risk controls for operating:**
  - (1) **beyond visual line of sight**
  - (2) **outside of daylight hours**
  - (3) **in cloud or reduced visibility**

- (4) above 400 ft AGL
- (5) over or in proximity of MEP
- (6) over or in proximity of critical infrastructure
- (7) more than one UA per remote pilot.

#### **UAS.40 – OPEN CATEGORY UAS**

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**UAS.40(a) Micro, Very Small and Small UAS shall only be eligible for operation under Open Category if they comply with the requirements and limitations contained in the following Standard Operating Conditions:**

- 1. Micro UAS (< 0.1 kg) shall:**
  - (1) be operated within visual line of sight
  - (2) be operated no higher than 400 ft Above Ground Level (AGL)
  - (3) be operated during daytime and not in cloud
  - (4) not operate in a way that creates a hazard to another aircraft, person or critical infrastructure
  - (5) not operate in a Prohibited Area, or a Restricted Area unless approved by the authority controlling the area
  - (6) not operate in the movement area or the approach or departure path of a runway of an aerodrome/ship without approval from the relevant authority
  - (7) not operate in such a manner as to create an obstruction to an aircraft
  - (8) be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group
  - (9) allow remote pilot intervention during all stages of the flight.
- 2. Very Small UAS (0.1–2 kg), in addition to the requirements and limitations for Micro UAS, shall:**
  - (1) not operate within 30 m of the general public (GP)
  - (2) not operate over populous areas
  - (3) not operate within 3 nm of the movement area of a controlled aerodrome without approval of the relevant airspace authority
  - (4) not operate over an area where a fire, police or other public safety or emergency operation is being conducted without the approval of the person in charge of the operation
  - (5) for each air vehicle, have a dedicated remote pilot.
- 3. Small UAS (2–25 kg), in addition to the requirements and limitations for Very Small UAS, shall:**
  - (1) only operate over land/water controlled by Defence



- (2) not operate in controlled airspace without approval of the relevant airspace authority.

#### **UAS.50 – WEAPONISATION AND CARRIAGE OF PASSENGERS**

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**UAS.50(a)** Integration of weapons onto Defence UAS shall require approval by the Authority.

**UAS.50(b)** Carriage of persons on Defence UAS shall require approval by the Authority.

#### **UAS.60 – OCCURRENCE REPORTING**

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**UAS.60(a)** The operator of a UAS shall:

1. report any identified condition of a UAS or any of its components which endangers flight safety
2. establish an occurrence reporting system to enable collection and evaluation of safety occurrence reports.

#### **UAS.70 – SUPPORT FOR AUTHORITY COMPLIANCE ASSURANCE**

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**UAS.70(a)** All data and access necessary to support initial and ongoing compliance assurance of UAS operations shall be made available to the Authority.

#### **UAS.80 – FOREIGN UAS OPERATIONS**

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**UAS.80(a)** Foreign military UAS shall have authorisation from an organisation within Defence prior to conducting flight operations in Australian airspace.

**UAS.80(b)** The organisation within Defence sponsoring foreign military UAS shall ensure the risks to other airspace users and persons/critical infrastructure are eliminated or otherwise minimised so far as is reasonably practicable.

**THE FOLLOWING PAGES PRESENT THE SAME DASR UAS REGULATIONS, BUT WITH THE ACCEPTABLE MEANS OF COMPLIANCE (AMC) AND GUIDANCE MATERIAL (GM) INSERTED. ONCE IMPORTED INTO THE AUTHORIT TOOL, THE AMC/GM WILL ONLY BE VISIBLE WHEN SELECTED BY THE USER.**

**IR – Air Operations**  
**Part UAS – Unmanned Aircraft Systems**

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**UAS.10 – UAS APPROVAL AND AUTHORISATION**

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**GM UAS.10 (#1) - Concept of Authority Approval and Command/Group Authorisation**

1. This GM defines the respective roles of the Authority and the relevant Defence Command or Group with respect to UAS operations.
2. For certain combinations of UAS and operating environments, the Authority will issue a discrete Authority Approval, through either:
  - a. the issue of a Military Type Certificate (MTC) (for the UAS) and a Military Air Operator Certificate (MAOC) (for the UAS operator)
  - b. the issue of an Unmanned Aircraft System Operating Permit (UASOP) (covering both the UAS and the Operator).
3. For some UAS operations, an explicit Authority Approval is not required. Rather, the Command or Group may authorise a UAS operation provided certain Authority-defined risk controls have been implemented, as presented in Standard Scenarios (refer DASR UAS.30(c)) or Standard Operating Conditions (refer DASR UAS.40).
4. Irrespective of whether the Authority issues a discrete Approval, the relevant Command/Group always maintains responsibility for ensuring the safe operation of UAS under their control. Consequently, the Command/Group must authorise all UAS operations.

**GM UAS.10 (#2) - Applicability**

1. DASR UAS is applicable to all UAS including unmanned targets, decoys and simulated weapons with a programmed or remote piloted flight path and which have a recoverable and reusable airframe. DASR UAS may be applicable to disposable/one time use UA such as submarine launched or air dropped UA. It is not applicable to guided missiles/rockets designed for single flight, including guided weapons with a loiter capability, provided the safety of those systems is assured via Defence's regulations for guided weapons. Where doubt exists as to regulation applicability, advice should be sought from the Authority.
2. For UAS operated by or on behalf of Defence, other than those regulated under DASR NDR, DASR UAS is applicable in its entirety. Furthermore, DASR UAS presents the complete set of initial airworthiness, continuing airworthiness and operations regulations relevant to UAS. Notably, other DASRs are only relevant to UAS if explicitly invoked through DASR UAS.

*Note: DASR UAS necessarily presents an independent regulation to the remaining DASRs. This is due to the provenance of the remaining DASRs, which were created for the risk context of manned aircraft. Consequently, for the most part, the DASRs focus on aircraft safe flight and landing, since this is essential to preserving the safety of aircraft occupants. In achieving that aim, the safety of other airspace users, and people and critical infrastructure on the ground/water, is inherently preserved. The absence of aircraft occupants in UAS changes that risk context. For example, from a safety perspective, an uncontrolled ground/water impact might not be considered intolerable for an unmanned aircraft operating in a sufficiently remote area. This difference in risk context is often sufficient to preclude the direct adoption of extant DASRs. Consequently, this DASR UAS presents the complete set of initial airworthiness, continuing airworthiness and operations regulations relevant to UAS.*

3. Even where an external party is providing the UAS as a service to Defence, the relevant Command/Group retains shared responsibility for ensuring the health and safety of Defence and non-Defence personnel. This statutory duty cannot be transferred in its entirety to the external party.
4. **UAS regulated by another National or Military Airworthiness Authority (N/MAA).** Where a UAS is being used for Defence purposes but is regulated by another N/MAA:
  - a. Authorisation by the relevant Command/Group is required for UAS operations, per UAS.10(a).
  - b. The statutory obligations for persons authorising UAS operations and operating the UAS must be met, per UAS.10(b)
  - c. The requirements of DASR NDR apply.
 

*Note: DASR NDR was created with the manned aircraft risk context in mind, so some minor interpretation is needed for UAS, as follows:*

    - (1) All references in DASR AMC NDR.05(a) to ‘... or equivalent document’ may be taken to refer to the approval granted by the N/MAA for that particular UAS and its operation.
    - (2) The flexibility provision presented in DASR GM NDR.10(a) cannot be used to operate the UAS outside the requirements and limitations, including operating areas, imposed by the N/MAA unless the sponsor either applies to the relevant N/MAA for a dispensation to their regulations, or temporarily operates under DASR UAS. If the latter option is selected, the N/MAA regulations, requirements and limitations will cease to apply for that period.
  - d. DASR UAS.20, DASR UAS.30 and DASR UAS.40 are not applicable.
  - e. Where the Command/Group is not satisfied that compliance with another N/MAA’s regulations will promote an appropriate level of safety, the Command/Group is obliged to impose all additional controls necessary to manage that risk.
5. Where the role and extent of involvement of another N/MAA is unclear, or the N/MAA is not recognised by the Authority, Authority advice (through ACPA) should be sought.
6. **Foreign UAS.** Where a Defence Organisation is sponsoring a foreign military UAS that is to operate in Australian airspace, only DASR UAS.80 applies. The remaining DASR UAS regulations are not applicable.

#### **GM UAS.10 (#3) - Definitions**

1. DASR UAS employs the following definitions:
  - a. **Unmanned Aircraft System (UAS).** The entire system consisting of the Unmanned Aircraft (UA), Remote Pilot Station (RPS), communications/data links, networks, launch and recovery systems, and personnel required to fly/control the UA.
  - b. **Unmanned Aircraft (UA).** An air vehicle that flies under remote control or autonomous programming without a human on board in control.
  - c. **Operator.** The organisation (eg MAO) or person with Operational Control (OPCON) or tasking authorisation for the UAS.
  - d. **Remote Pilot (RP).** The person in direct command/control of the UAS, including manipulating flight controls or programming waypoints during flight.
  - e. **Remote Pilot Station (RPS).** A station at which the remote pilot manages the flight of an unmanned aircraft.

- f. Mission Essential Personnel (MEP).** All persons directly associated with the operation of the UAS or briefed as part of the UAS mission.
- Note: MEP includes all persons directly associated with the operation of the UAS or briefed as part of the UAS mission. MEP is broader than personnel directly associated with the launch, recovery and control during flight of the UAS. MEP may, depending on the UAS mission, include civilians, Defence personnel, and/or foreign defence personnel. MEP must be aware of the UAS operations, the associated hazards and be essential to the conduct of the UAS task. MEP may include ground troops within a Defence joint operation/exercise area, troops on a Defence ship or civilian personnel operating as part counter terrorism tasking.*
- g. General Public (GP).** All persons not classed as MEP, including all persons not directly associated with the operation of the UAS or briefed as part of the UAS mission.
- Note: GP includes all persons not classed as MEP, including all persons not directly associated with the operation of the UAS or briefed as part of the UAS mission. GP may, depending on the UAS mission, include civilians, Defence personnel, and/or foreign military personnel.*
- h. Segregated Airspace.** Airspace of specified dimensions allocated for exclusive use to a specific user(s).
- i. Populous area.** An area in relation to the operation of an unmanned aircraft that has a sufficient density of population for some aspect of the operation, or some event that might happen during the operation (in particular, a fault in, or failure of, the unmanned aircraft) to pose an unreasonable risk to the life or safety of somebody who is in the area, but is not connected with the operation.
- j. Critical infrastructure.** A facility that, if damaged by a UA, may have an immediate and adverse effect on MEP or GP health and safety.
- k. Standard Scenario.** A description of a UAS operation in the Specific category, for which mitigation measures have been determined based on a risk assessment, and introduced by the Authority.
- l. UAS Operating Permit (UASOP).** Approval to operate a UAS that is not Certified. Issued by the Authority, based on a risk assessment and the implementation of related mitigation measures.
- m. Defence Controlled Land.** Land where Defence controls access by the general public, such that Defence can ensure UAS operations can be conducted which are not in the proximity of, or overhead, the general public.
- 2.** To promote international harmonisation, definitions per ICAO Circular 328, *Unmanned Aircraft Systems*, are employed by Defence where practicable. Consequently, the definitions for UAS, UA, Operator, RP, RPS and segregated airspace are drawn from ICAO Circular 328, with minor adaption to suit the military context where necessary. Where additional UAS definitions are required, preference should be given to those in ICAO Circular 328.
- 3.** The MEP and GP concepts are drawn from the USA Range Commanders Council Standard 321.10, *Common Risk Criteria Standards for National Test Ranges*, but adapted for Defence UAS operations.
- 4.** The definition for ‘populous area’ is drawn from CASA Advisory Circular (AC) 101.10 - *Remotely piloted aircraft systems - licensing and operations*, however reference to property of people in the area has been removed as it is not relevant to the Defence aviation safety context. While that Advisory Circular also provides explanatory material for the concept of populous areas in the civil context, the information is not entirely relevant to the Defence context. Consequently, the material in DASR UAS takes precedence.
- 5.** In the Defence aviation safety context ‘critical infrastructure’ is defined slightly differently to the civilian context as it relates only to facilities where UAS damage may have an ‘immediate and adverse’ affect. Examples may include chemical plants, armament storage facilities, and fuel storage facilities.

**UAS.10(a) Defence UAS shall only be operated if authorised by the relevant Command or Defence Group.**

**AMC UAS.10(a) - Responsibility for UAS Authorisation**

1. **Purpose.** The purpose of this regulation is to emphasise the primacy of Commanders and managers in ensuring the safety of UAS under their control.
2. Authorisation is required by the relevant Command/Group for all Defence UAS operations, irrespective of whether the UAS is operated by or on behalf of Defence, and whether the UAS operation is regulated by another N/MAA. The level and the mechanism to issue such Authorisations are determined by the Command/Group.
3. All Defence UAS, other than those regulated under DASR NDR, should be registered prior to first operation, either on the Defence Register (when directed by the Authority) or on a local register. When requested by the Authority, the Command/Group should be able to readily provide the Authority with a list of each UAS, and the UAS categories under which they have been authorised to operate. For UAS that require only local registration, a centralised register for each Service/Group is recommended. Local registers need be no more complex than an asset list.
4. **Authorisations by Defence Groups.** Where a Defence UAS is being operated by a Service (Navy, Army or Air Force), the responsibility for Authorising UAS operations clearly falls on Command. Where a Defence UAS is being operated by a Defence Group (eg DSTG, E&IG, CIOG), while the concept of 'Command' may not be directly relevant, the requirement still exists for UAS operations to be Authorised. The Group Head is ultimately responsible for determining who within their Group has the authority to make UAS safety risk decisions for their own staff and for external parties. Where no such determination has been made, the Group Head should be approached to Authorise the UAS operation.

**UAS.10(b) Persons Authorising, and Operators of, a UAS are:**

1. **to eliminate risk to health and safety, so far as is reasonably practicable, to other air users, and to personnel and critical infrastructure on the ground or water, and**
2. **if it is not reasonably practicable to eliminate risk to health and safety, to minimise those risks so far as is reasonably practicable.**

**GM UAS.10(b) - Responsibilities**

1. **Purpose.** The purpose of this regulation is to emphasise the statutory responsibilities held by persons who authorise, and Operators of, UAS, to eliminate or minimise risks so far as is reasonably practicable.
2. While adherence to the risk controls inherent in DASR UAS will assist in executing this responsibility, it will rarely be sufficient in isolation. Also, in authorising UAS operations by RPs who may be less familiar with the broader concepts of flight operations safety management, the relevant Command/Group may need to apply additional risk controls.
3. While RPs are not explicitly included in this regulation, they still have a statutory duty to take reasonable care that their acts or omissions do not adversely affect the health and safety of other persons.

**UAS.10(c) All Defence UAS shall operate in accordance with the requirements and limitations of Certified, Specific or Open category.**

**GM UAS.10(c) - Operation Under UAS Categories**

1. **Purpose.** The purpose of this regulation is to allow the relevant Command/Group to authorise UAS operations with the risk treatment and Authority oversight applicable to that operation.
2. A central tenet of DASR is to provide the Command/Group with a defensible safety framework, tailored to the hazards peculiar to aviation and based on contemporary global practice. UAS

operations are permitted within recognised categories of operation while still allowing the Command/Group freedom to conduct missions/tasking.

3. DASR UAS does not require UAS to operate within a fixed category from acquisition. Rather, any UAS that meets all the requirements of a given category may be operated in that category under Command/Group Authorisation. Three categories of UAS operation are:
  - a. **Certified Category.** Intended for UAS operations where the operator expects to operate in all airspaces and over all populous areas. Consequently robust initial, continuing and operational airworthiness regulation and Authority oversight is required to manage the safety risk to other parties. Authority approvals for initial and continuing airworthiness and operations are analogous to manned aircraft.
  - b. **Specific Category.** Intended for UAS operations where the UAS is not certified to robust airworthiness standards. Consequently, increased operational constraints and risk assessment provide justification for safe operation. UAS may operate either:
    - (1) under an Authority issued UASOP
    - (2) in accordance with an Authority-published Standard Scenario, without a discrete Authority approval.
  - c. **Open Category.** Intended for UA weighing less than 25kg, and operations within Authority-defined Standard Operating Conditions. UAS operations may proceed without a discrete Authority approval, under Command/Group authorisation.
4. The above approach shares its genesis with the extant CASA and proposed EASA approaches to UAS regulation. The three category names and underlying regulatory approach are drawn from EASA, thus promoting commonality with an emerging global convention and future compatibility with EMAR. Defence's Open category has been aligned with CASA's Excluded category, to promote commonality in Australian civil and military UAS regulation.

#### **AMC UAS.10(c) (#1) - Applicability of this Regulation**

1. Defence UAS regulated under DASR NDR are not subject to DASR UAS.10(c).
2. All other UAS operated by or on behalf of Defence are to operate in accordance with the requirements and limitations of Certified, Specific or Open category.

#### **AMC UAS.10(c) (#2) - UAS Categorisation**

1. UAS categories are defined by the intended operations and technical specifications of the UAS. Each category imposes particular requirements and limitations, and these requirements/limitations are to be met in their entirety if operations under a particular category are to be pursued.
2. Where the UAS category is unclear or disputed, the Authority will make the determination.

**UAS.20 – CERTIFIED CATEGORY UAS**

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**UAS.20(a). UAS shall only be eligible for operation under Certified category if they:**

1. are Defence registered
2. have a SOIU in accordance with DASR ARO.50
3. are type-certificated in accordance with DASR 21
4. comply with all initial and continuing airworthiness DASR
5. are operated under a MAOC in accordance with DASR ARO.100
6. comply with DASR Air Operations and Standard Rules of the Air
7. are controlled by a remote pilot who is a qualified military pilot, or qualified in accordance with requirements mandated by COMAUSFLT/COMD FORCOMD/ACAUST.

**GM UAS.20(a) - Scope**

1. **Purpose:** The purpose of this regulation is to require UAS operated in the Certified category to be airworthy and operated to equivalent standards of safety to manned aircraft.
2. UAS operated under the Certified category are intended to operate over both GP and MEP, and in all classes of civil and military administered airspace for which they are equipped, and therefore demonstrate the ability to act and respond as manned aircraft do.

**AMC UAS.20(a)3 - Initial Airworthiness**

1. The airworthiness of the UAS design (including through-life modifications) must be demonstrated to the satisfaction of the Authority per DASR.21. AAP 7001.054, *Airworthiness Design Requirements Manual*, presents design requirements for Certified category UAS. In addition to design requirements common to manned aircraft, it includes those systems and functions that are needed to address the UAS-unique hazards due to the Remote Pilot (RP) being separated from the UA. This includes, for example, communications relay capability between the RP and Air Traffic Control (ATC), timely reaction to ATC instructions, systems to maintain safe separation and collision avoidance with other air traffic, and the ability to recover the UA under abnormal emergency conditions.

**AMC UAS.20(a)6 - Standard Rules of the Air**

1. UAS operated under the Certified category are intended to operate over both MEP and GP, and in all classes of civil and military administered airspace for which they are equipped, and therefore demonstrate the ability to act and respond as manned aircraft
2. In applying DASR Standard Rules of the Air, Command must ensure that degraded modes of UAS operation, which can impose hazards that are unique to UAS (for example, failure of the Detect and Avoid capability), are robustly identified and risk managed. An Air Traffic Management Plan (ATMP), as described in AMC to UAS.30(b) presents one means of documenting these unique hazards and risk treatments.

**AMC UAS.20(a)7 - RP Qualifications**

1. UAS operated under the Certified category may be controlled by an appropriately qualified military pilot, in accordance with DASR AIRCREW.
2. The requirement for a RP who is a qualified military pilot does not preclude the future development of a specialised Defence Remote Pilot category as a potential AMC to DASR UAS.20.a(7).
3. RP must comply with DASR.MED.10 and DASR.MED.15.
4. There is currently no DASR UAS FSTD/simulator regulation. Future regulation, if required, may be included in DASR FSTD.

**UAS.30 – SPECIFIC CATEGORY UAS**

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**UAS.30(a) UAS shall only be eligible for operation under Specific category if they are operated under either:**

1. a UASOP issued by the Authority (Specific Type A), or
2. a Standard Scenario published by the Authority (Specific Type B).

**GM UAS.30(a) - Eligibility Criteria**

1. **Purpose.** The purpose of this regulation is to define the eligibility criteria for Defence UAS operations under Specific category.
2. Defence UAS operating under Specific category employ a risk assessment as the primary basis for managing the safety risk to other airspace users, and persons/critical infrastructure on the ground/water. There are several means available to manage this safety risk:
  - a. **Design mitigation.** Design mitigation concerns the application of rigour to the design and construction process such that system's likelihood of catastrophic failure is known and controlled. Through the application of more rigorous design standards, or inclusion of systems designed to support safe operation, the likelihood of failure can be reduced.
  - b. **Operational mitigation.** Operational mitigation concerns the application of restrictions and limitations to the operating environment of the system. This may include such measures as limiting operation to segregated airspace, over a designated ground/water safety area or restricting flight over the general public.
  - c. **Systemic mitigation.** Systemic mitigation concerns the application of regulatory standards to organisations involved in the design, construction, maintenance and operation of the system. Systemic mitigation is intended to reduce the occurrence of organisational and human errors which can contribute to failure of a system. Systemic mitigation supports design mitigation, operational mitigation, and continuing airworthiness of the system.
3. Commonly, UAS operating under Specific category will exhibit deficiencies in their design (or in the available evidence to confirm the adequacy of the design) compared to Certified category UAS. Further, eliminating these design deficiencies is often not reasonably practicable, particularly for smaller UAS. Consequently, safety risk due to Specific category operations is managed through operational and systemic controls.
4. **Authority Approval.** Under Defence Specific category, a UAS operation may be explicitly Approved by the Authority via the issue of a UASOP. An alternative approach is for the Command/Group to Authorise the UAS operation without an explicit Authority approval, provided every requirement and limitation of an Authority-published Standard Scenario has been met and risk controls implemented. The latter is intended to reduce the administrative work for Command/Groups and the Authority, since those same requirements, limitations and risk controls would inevitably have been agreed by the Authority had they been included in an application for a UASOP.
5. For communications convenience, Defence may elect to refer to UAS operations Approved by the Authority via a UASOP as 'Specific Type A', and UAS operations authorised by the relevant Command/Group under a Standard Scenario as 'Specific Type B'.

**UAS.30(b) Specific category UAS to be operated under a UASOP (Specific Type A) shall:**

1. be Defence registered when directed by the Authority
2. have its role and operating environment documented in an SOIU when directed by the Authority
3. comply with DASR initial and continuing airworthiness regulations to the extent directed by the Authority
4. comply with the Military Air Operator requirements of DASR ARO.100, to the extent directed by the Authority
5. comply with DASR under Air Operations and Standard Rules of the Air to the extent directed by the Authority



6. **be controlled by a remote pilot who is qualified as specified in the UASOP**
7. **operate within the requirements and limitations included on the UASOP.**

#### **GM UAS.30(b) - Eligibility for a UASOP**

1. **Purpose.** The purpose of this regulation is to define the Authority's requirements for issue of a UASOP for UAS that are to be operated under Specific category, but whose operations do not conform to an Authority-published Standard Scenario.
2. The UAS Operating Permit (UASOP) is an instrument issued by the Authority for certain Specific category operations. A UASOP would normally only be pursued where:
  - a. the operating freedoms of Certified category are either not necessary or not achievable
  - b. the UAS design and/or its proposed operations do not entirely meet the requirements of an Authority-published Standard Scenario
  - c. (for UA with a MTOW of less than 25 kg) the proposed operations do not entirely meet the Standard Operating Conditions under Open Category.

#### **GM UAS.30(b) - Extent of Compliance**

1. UAS.30(b)2 to UAS.30(b)5 recognise that many DASRs were created for the context of manned aircraft, so the burden of full compliance may be disproportionate to the safety benefit for certain UAS designs and operations. Consequently, each provides scope for the Authority to moderate the required level of compliance.
2. Normal practice would be for the UASOP Applicant to propose a suitable extent of compliance, for Authority approval.

#### **AMC UAS.30(b) - Authority Requirements for Issue of a UASOP**

1. This AMC presents the Authority's minimum application requirements for issue of a UASOP and provides the means to assist Command/Group's risk analysis.
2. Compliance with this regulation requires disclosure of the intended operating environment for the UAS and an understanding of the design deficiencies of the UAS. Provided constraints in the operating environment minimise risks due to the design deficiencies of the UAS, so far as is reasonably practicable, the Authority will issue a UASOP for the particular UAS and scope of operations if satisfied that the relevant Command/Group:
  - a. has clearly defined the intended operating environment for the UAS
  - b. has provided a meaningful characterisation of the risks presented by the UA to other aircraft, and people/critical infrastructure on the ground/water
  - c. has implemented robust operational risk controls to minimise the risk to other aircraft, and people/critical infrastructure on the ground/water so far as is reasonably practicable
  - d. is supported in minimising these risks by sufficient UAS initial and continuing airworthiness arrangements
  - e. fully comprehends and has retained any remaining risks at a suitable level after risk minimisation.
3. The UASOP should include the UAS basis of technical approval, key initial and continuing airworthiness requirements, and special conditions to balance the operational requirements with the risk of the UAS operation. A UASOP enables the UAS to operate in its designated Configuration, Role and Environment (CRE), and will:
  - a. identify the UAS
  - b. reference the approved SOIU or OIP defining the designated CRE
  - c. reference appropriate design documentation which identifies the approved configuration(s)
  - d. identify operational restrictions applied to mitigate the risk the UAS presents to personnel, critical infrastructure and other aircraft

- e. identify, or reference, any unique aviation safety management arrangements required for ongoing operations with the UAS type
- f. identify operational, maintenance and engineering authority for the UAS
- g. identify the approved UAS operating units
- h. identify the authoritative operating and maintenance documentation
- i. identify any applicable operating limitations resulting from:
  - (1) the immaturity of the supporting management arrangements
  - (2) airworthiness issues affecting the system's suitability for the SOIU purpose and scope
  - (3) Test and Evaluation activities performed prior to issue of the UASOP.

4. AMC for these requirements is included below.

#### **Risk Assessment - Risks to other airspace users**

5. For a UAS to enjoy unimpeded access to an airspace class, it should include all equipage required for the airspace and be operated by a RP with the requisite qualifications for the airspace. Unless the UAS has been specifically designed with particular airspace in mind, the former can be problematic. Dedicated design effort is required for areas such as replacements for pilot 'see-and-avoid' capability, and the integrity of positional and altitude information sources, making them difficult to retrofit.

6. Where a UAS requires access to an airspace class but does not exhibit the required equipage or RP qualifications, operational risk treatments will be required. Provided the Authority is satisfied the risk to other airspace users has been eliminated or otherwise minimised so far as is reasonably practicable, then a UASOP may still be issued by the Authority. Importantly, the Authority would normally require explicit confirmation that the Command/Group had comprehensively understood the risks to other airspace users, and that the Command/Group had effectively executed its duties to eliminate/minimise those risks so far as is reasonably practicable.

*Note: While airspace modelling might contribute to the relevant Command/Group's risk management endeavours, a modelling conclusion that risk is 'low' would not normally be sufficient justification to omit higher order controls. Rather, the difficulty of modelling collision likelihoods may require the risk to be considered in absolute, worst case terms, i.e. the likelihood that a collision will occur is assumed to be certain if the aircraft is operating within a certain density level or volume of airspace.*

7. Systems should be included in the UAS to prevent inadvertent UA flight beyond authorised airspace, or the absence of such systems should be managed through operational risk controls.

8. **Segregated Airspace.** In considering the risk presented by a UAS to other airspace users, the term Segregated Airspace is used. Segregated Airspace is airspace of specified dimensions allocated for exclusive use to a specific user(s). Mixing of other aircraft (manned or unmanned) and a UA within a Segregated Airspace intended for use by the UA should be avoided. Specific operational restrictions pertaining to UA flight within Segregated Airspace (sustained, limited or otherwise), should be identified to ensure the UAS presents risks that are minimised so far as is reasonably practicable to other airspace users. Airspace Control Measures (ACM) may be used to facilitate the containment of a UA within Segregated Airspace.

9. Additional considerations for segregated airspace include air traffic density, particularly if the UA airspace is other than controlled airspace, as other aircraft may be able to enter the airspace without a clearance. Danger Areas designed for General Aviation (GA) transit and similar flight paths should be avoided. Importantly, the 'see and avoid' principle is a main safety defence for any shared airspace.

10. The Authority will require assurance that UAS operations will remain within the allocated Segregated Airspace, including an assessment of the level of confidence that escape will not occur. Factors that affect this confidence may include the integrity of UAS positional information, UAS communications performance, RP experience and maturity of procedures.

11. **Air Traffic Management Plan (ATMP).** An ATMP is one means of documenting the specific risks of collision with other airspace users, and the operational or airspace limitations needed to maintain the safety of the airspace. It may include:

- a. operational restriction and mitigation measures to enable operation in the required airspace, in the absence of approved navigation and communication capability
  - b. operational restriction and mitigation measures to enable separation in the required airspace, such as Air Traffic Service (ATS) in controlled airspace, in the absence of approved means of self-separation and/or collision avoidance or Certified detect and avoid capability
  - c. approved RPs (as per Certified category UAS) or suitably trained RPs restricted to operate in specific airspace only.
12. In achieving the above outcomes, an ATMP may include:
- a. where the UA is required or likely to operate
  - b. the nature and density of the air traffic in the required area of operations, noting such specifications are likely to change as mission objectives change post UASOP approval
  - c. the size and velocity of the UA, and unique characteristics of the UAS
  - d. the accuracy, integrity and reliability of fitted systems such as positional information, collision avoidance, flight control, communication and other relevant UAS systems
  - e. the strategy or method for the safe interaction or de-confliction with all other airspace users
  - f. the requirements for notification to other airspace users of intended operations with the UA
  - g. the requirements for notification to other airspace users of any segregated airspace required for the intended operations
  - h. the anticipated segregated airspace volumes required to support operations, including airspace boundary buffers
  - i. any utilisation of unique Airspace Control Measures (ACMs) such as Flexible Use Airspace (FUA), User Preferred Trajectories (UPTs) or UAS Transit Corridors.
13. The Headquarters Joint Operations Command Air & Space Operations Centre (ASOC) Joint Airspace Control Cell (JACC) provides support for the development or amendment of UAS ATMPs and should be used to gain SME advice before an ATMP is recommended for endorsement by the airspace management agencies and the Authority. UA transit through non-segregated airspace may be conducted where UA transit routes have been designated and activated by the appropriate airspace management agency, which includes Airservices Australia, Defence Air Traffic Services or JACC. Any desire for permanent transit routes should be processed via the JACC in all cases.

#### **Risk Assessment - Risks to people**

14. A UAS is normally assigned to Specific category because the design cannot, or need not, meet certified aircraft airworthiness standards. Where reasonably practicable, these safety risks should be eliminated or otherwise minimised through engineering effort. However, such design solutions may not always be practicable, especially for smaller off-the-shelf UAS.
15. Consequently, a Specific category UAS may suffer catastrophic failures more often than a Certified category UAS. These failures may result in either controlled or uncontrolled descent of the UA. Failures resulting in controlled descents (eg engine failure) should present minimal risk to people and critical infrastructure, but only to the extent that pre-flight planning has identified candidate forced landing sites, or on-board systems enable the RP to identify suitable sites in real time. Failures resulting in uncontrolled descents (eg structural failure, system-induced stalls, seized control surface, etc), on the other hand, will present risks to people on the ground/water, depending on the location and orientation of the UA at the time of the failure.
16. Risk may be eliminated or otherwise minimised so far as is reasonably practicable by limiting the exposure of people to the risk, which in turn could be achieved by limiting where and how a Specific category UAS can operate. For the Authority to issue a UASOP, it must be satisfied that the relevant Command/Group has made informed decisions on eliminating/minimising risk to people. A systematic process is therefore required to identify, analyse and treat all risks to people (both MEP and GP) on the ground/water.
17. The Authority broadly separates UAS operations into three operating environments, with each logically increasing the level of risk to people on the ground/water, as follows:
- a. UAS operations in a sufficiently remote area, such that a catastrophic UAS failure is very unlikely to result in impact to a person

- b. UAS operations in proximity (ie near but not over) of a population (whether GP or MEP), and therefore certain catastrophic failures could result in impact to a person
  - c. UAS operations overhead of a population (whether GP or MEP), and therefore certain catastrophic failures will likely result in impact to a person.
18. Each requires a tailored approach to risk characterisation, sufficient for the Command/Group to make informed decisions on eliminating or otherwise minimising risk so far as is reasonably practicable, and therefore warranting issue of a UASOP.
19. **UAS operations in remote areas.** Regardless of UA size, the Authority would normally issue a UASOP for this operating environment provided:
- a. The applicant has confirmed that the following technical issues have been addressed:
    - (1) Systems are included in the UAS to prevent inadvertent UA flight beyond authorised area of operation, or the absence of such systems has been managed through operational risk controls.
    - (2) The likelihood of controlled and uncontrolled ground/water impacts have been estimated and communicated to operators.
    - (3) Potential spectrum conflicts between the UAS and local transmitters/receivers have been managed.
    - (4) The UA has been designed for immunity to electro-magnetic interference, or operational controls have been employed to reduce the likelihood of adverse effects.
  - b. The relevant Command/Group has confirmed the sufficiency of the following:
    - (1) OIP has been issued to guide operators on pragmatically identifying and avoiding any isolated populations (eg homesteads, busy roads, etc).
    - (2) OIP precludes operations in other than remote areas, unless the UASOP covers other areas.
    - (3) RPs have the qualifications, training and supervision to safely retain the UAS within the assigned area.
    - (4) OIP requires risks to the few MEP in the area to be minimised so far as is reasonably practicable.
    - (5) A system is in place for authorising each flight that focuses on confirming risks have been minimised so far as is reasonably practicable.
20. WHS legislation makes the Command/Group accountable for treating the broader hazards related to the handling of a UA, such as hazardous materials, sharp edges, or electric shock and these are not further amplified under DASR.
21. **UAS operations in proximity of populations.** The likelihood of a ground fatality as a result of a catastrophic UAS failure when near (but not over) populations is likely to be a function of the UA size, failure type, distance from the population and the population density. Energy attenuation devices (eg a parachute) may also contribute, although the increased uncertainty in landing footprint needs to be taken into account.
22. The effort applied to characterising the risk should be proportionate to the time in proximity to people (since it affects collective risk), the closest approach distance (since it affects the likelihood of a dangerous impact) and the size of the UAS (since it affects the casualty expectation). While the level of effort will ultimately be agreed with the Authority, some upper and lower examples are illustrative:
- a. At the lower end of the scale would be a small UAS with only occasional fleeting proximity to the general public. In those cases, the Authority would issue a UASOP on the basis of confirmation that the Command/Group had a process in place for authorising such operations, and OIP has been published to ensure risks were minimised so far as is reasonably practicable.
  - b. At the higher end of the scale would be a large UAS that will loiter for extended periods in close proximity (near but not over) to densely populated areas. In those cases, the Authority would only issue a UASOP if the complex risk environment had been well-characterised, sufficient for the Command/Group to make informed decisions on eliminating/reducing risks, including:

- (1) effort to confirm the design deficiencies of the UAS are well understood and well communicated to RPs, so they can robustly identify and manage occurrences (and therefore reduce the likelihood of a ground impact).

*Note: While evidence may not always be available to confirm design deficiencies, professional engineering judgement will often suffice. For example, an integrated GPS/INS that appears markedly less complex than similar manned aircraft systems could reasonably be expected to exhibit higher drift rates when GPS signal is lost and may therefore display erroneous position information. Operational risk controls can be established on the basis of this judgement. AAP 7001.054, Airworthiness Design Requirements Manual, Section 4 Chapter 3 presents candidate systems for such assessments.*

- (2) confirmation via quantitative analysis that agreed individual risk and collective risk safety targets for GP will not be exceeded for discretionary operations

*Note: Where quantitative assessments are not practicable (eg fleeting exposures), then conservative qualitative assessments may suffice.*

- (3) establishment of stand-off distances needed for discretionary operations to maintain those safety targets
- (4) OIP that clearly defines where stand-off distances can be exceeded for non-discretionary tasks, including the authorising authority, bounds on authority and criteria for exercising that authority.
- (5) confirmation that initial and continuing airworthiness arrangements have been implemented to the extent that they contribute to minimising risks to GP/MEP so far as is reasonably practicable
- (6) operational airfield assessments, including qualitative runway assessments for take-off/departure and approach/landing, to robustly control the risk of uncontrolled ground impacts due to technical failures.

**23. UAS operations overhead of populations.** The likelihood of a ground fatality due to a catastrophic UAS failure when operating overhead of populations, is primarily a function of the UAS impact lethality (a function of weight, size, energy attenuation devices, etc), the population distribution, and the effect and extent of sheltering. To estimate collective risk, the duration of operations and the frequency of catastrophic UAS failures must also be accounted for.

**24.** For the Authority to issue a UASOP that includes flight over people:

- a. Command/Group must confirm there are no reasonably practicable alternatives that eliminate the risk
- b. all reasonably practicable technical measures to minimise the risk must be implemented
- c. all reasonably practicable operational measures to minimise the risk must be implemented
- d. all reasonably practicable RP training measures to minimise the risk must be implemented
- e. OIP must be issued to guide the RP (and Operator, if a separate person) in minimising the risk so far as is reasonably practicable
- f. the scope and conditions for discretionary (ie non-mission essential) flight over people must be well define;
- g. the risk to MEP inherent in such operations must have been well articulated to ACAUST, COMD FORCOMD, COMAUSFLT or Head of Defence Group (as appropriate), and the residual risk (including any uncertainty in residual risk) must have been retained, and
 

*Note: UASOP Applicants considering MEP overflight should seek current advice from the DASA.*
- h. the risk to GP (if GP overflight is contemplated) inherent in such operations must have been well articulated to Defence, and residual risk (including any uncertainty in residual risk) must have been retained.

*Note: UASOP Applicants considering GP overflight should seek current advice from the DASA.*

**25.** The Authority expects there should be an overriding and substantial capability imperative for flying a Specific category UAS over the GP, and that all reasonably practicable steps would have

been considered to minimise the GP's risk exposure. Where such an argument cannot be mounted, a Certified category UAS should be employed.

### **Risk Assessment - Risks to Critical infrastructure**

26. Larger UAS have the potential to damage ground-based infrastructure. From an aviation safety perspective, only damage that may have an immediate and adverse effect on MEP or GP health and safety is considered within the scope of DASR UAS. Examples may include UAS damage to chemical plants, armament storage facilities, fuel storage facilities, and so on.
27. The Authority's requirement for issue of a UASOP is that the Command/Group has approved OIP that defines critical infrastructure (relevant to the size and operating environment of the UAS), and the measures to be taken by the UAS Operator to minimise risks to that critical infrastructure so far as is reasonably practicable.
28. While the Authority's focus for critical infrastructure is confined to immediate and adverse safety effects, the Command/Group might elect to encompass a wider scope. For example, the US military document RCC 323-99, *Range Safety Criteria for Unmanned Air Vehicles, Rationale and Methodology Supplement*, provides the following suggested criteria for significant facilities:
  - a. loss or degradation of a major function
  - b. significant monetary loss
  - c. significant environmental impact and/or cultural impeach.

### **Additional Operational controls**

29. When formulating the operational controls identified in the previous sections for minimising risk to other airspace users and persons/critical infrastructure on the ground/water, the Command/Group must also identify where operational errors may impact safety. These may include:
  - a. mid-air collision resulting from inadequate mission planning or RP induced error
  - b. controlled flight into terrain
  - c. loss of control through inadvertent operation outside approved limits
  - d. incorrect use of on-board mission systems, eg laser designation systems.
30. In each case, the risk must be robustly managed.

### **AMC UAS.30(b)1 - Defence Registration of UAS**

1. All Defence UAS should be registered prior to first operation, either on the Defence Register (when directed by the Authority) or on a local register. When requested by the Authority, the Command/Group must be able to readily provide the Authority with a list of all UAS, and the UAS categories under which they have been authorised to operate. For UAS that require only local registration, a centralised register for each Service is recommended.
2. Defence Registration would normally only be considered by the Authority for UAS with a MTOW of at least 25 kg.

### **AMC UAS.30(b)2 - Defining the UAS Operating Environment**

1. An SOIU presents a common tool for the relevant Command/Group to disclose their intended operating environment for an aircraft. The SOIU guidance presented at DASR AMC ARO.50(a) for manned aircraft is therefore equally applicable to UAS. However, it requires expansion to account for UAS-unique hazards, and should also include:
  - a. the extent to which the UA is required to operate near or over people and critical infrastructure including the duration and expected population density, amplifying:
    - (1) population distributions of MEP to whom the UA may present a hazard
    - (2) population distributions of the GP to whom the UA may present a hazard

- b. airspace environments in which the UA may operate, including the extent to which the UAS will operate in shared airspace
  - c. the extent to which the UA is required to operate in the proximity of aerodromes and ships
  - d. the extent to which the UA is required to operate near critical infrastructure.
2. Note the Authority may be able to issue a UASOP without the need for an SOIU in certain circumstances. Examples may include small UAS that do not qualify for operation under Open category due to exceeding a Standard Operating Condition. Conversely, a large UAS operating in a diverse and complex operating environment will inevitably require a detailed SOIU. Consequently, the Authority will direct when a SOIU is required.

### **AMC UAS.30(b)3 - Initial and Continuing Airworthiness Requirements**

1. The Authority will require compliance with DASR initial and continuing airworthiness requirements only to the extent they make a tangible contribution to the safety of other airspace users, or persons/critical infrastructure on the ground/water. The extent of compliance ultimately depends on the complexity of the proposed operating environment and the robustness of the UAS design. While the level of compliance will be agreed with the Authority, some upper and lower examples are illustrative:
- a. At the lower end of the scale would be a small UAS with only occasional fleeting proximity to the GP. In those cases, the Authority may impose no requirements for initial and continuing airworthiness. Command/Group should still consider imposing UAS design and maintenance support requirements, in an effort to ensure health and safety, and improve capability through reduced attrition.
  - b. At the higher end of the scale would be a large UAS that will loiter near/over the GP, or a UAS that will operate in shared airspace. In those cases, the Authority would require compliance to initial and continuing airworthiness requirements, to the extent that it makes a direct and meaningful contribution to safety.

### **AMC UAS.30(b)4 - Operations under a MAOC**

1. The Authority may require a particular UAS to be operated under a MAOC, where the risks to other airspace users and/or persons/critical infrastructure on the ground/water warrants the robust approach to aviation safety management provided by a MAOC.
2. MAO regulation for FMS, captaincy, crewing and flight authorisation apply to UAS. However, they should be appropriately contextualised by the Command/Group to adapt to the UAS role and operating environment.
3. **Operations not under a MAOC.** Even where the risk due to UAS operations does not justify operations under a MAOC, the Authority would still require an FMS in which:
- a. key staff are identified and appointed
  - b. OIP are applicable, approved, available and relevant to the scope of operations
  - c. crew competency is defined, assessed and maintained
  - d. the authorisation process for conduct of operations is defined
  - e. AVRMS is applied relevant to the impact of operations on other airspace users, people and critical infrastructure
  - f. any necessary ground/water safety or exclusion templates are implemented and controlled
  - g. use of ground and air collision avoidance, flight termination and emergency recovery systems is defined and controlled
  - h. OIP issued to manage UAS flying operations take into account the CRE and any unique operating characteristics of the UAS
  - i. the UAS is only operated when serviceable and suitable for the proposed operations.

**AMC UAS.30(b)5 - Compliance with DASR Air Operations and Standard Rules of the Air**

1. Unless operational controls preclude any need, UAS are expected to comply with DASR Air Operations and Standard Rules of the Air, to the extent needed to manage risks to other airspace users or persons/critical infrastructure.

**AMC UAS.30(b)6 - Remote Pilot Qualifications**

1. When proposing a new or updated UASOP to the Authority, the Command/Group should define:
  - a. the required Remote Pilot qualifications
  - b. any requirement for the Remote Pilot to hold a current aviation medical certificate in accordance with DASR.MED.10.

**AMC UAS.30(b)7 - Requirements for Embarked Operations**

1. Where a UASOP allows for embarked operations, the Command/Group should ensure the following additional sources of potential requirements and limitations have been evaluation, and included in the UASOP where relevant:
  - a. the ship's Aviation facilities Certification (AFC)
  - b. ship operational restrictions
  - c. assessments of the ship-air interface.

**UAS.30(c) Specific category UAS to be operated under a Standard Scenario (Specific Type B) shall:**

1. **be operated only under Standard Scenarios at DASR UAS.35**
2. **be notified to the Authority prior to commencement of operations.**

**GM UAS.30(c) - Standard Scenarios**

1. **Purpose.** The purpose of this regulation is to outline the Authority's requirements for the Command/Group to authorise operation of a UAS under an Authority-published Standard Scenario.
2. Defence UAS operating under Specific category employ a risk assessment as the primary basis for managing the safety risk to other airspace users, and persons/critical infrastructure on the ground/water. Commonly, UAS operating under this category will exhibit deficiencies in their design compared to Certified UAS, so the safety risk due to these deficiencies is managed through imposing constraints in their airspace access and constraints in their operations near or over people/critical infrastructure.
3. Authority-published Standard Scenarios present an alternative to the issue of a UASOP for a particular UAS and operating environment. A Standard Scenario defines each of the technical and operational risk controls that, had the Command/Group presented them to the Authority, should justify Authority issue of a UASOP. Consequently, both approaches should achieve similar levels of safety, but Standard Scenarios provide a means for reducing administrative overhead.
4. Standard Scenarios are best suited to UAS that are employed in benign and predictable operating environments, and therefore technical and operational risk controls are likely to be more straightforward. For larger UAS that are intended to conduct diverse operations in non-benign environments, a UASOP per DASR UAS.30(b) is likely to be more suitable.
5. **New Standard Scenarios.** Standard Scenarios are raised by the Authority where there is an expectation of multiple future Defence UAS being operated in a similar operating environment, and where the required risk controls can be clearly identified by the Authority. Suggestions for new Standard Scenarios may be proposed to the Authority. Development of new Standard Scenarios will normally involve a collaborative effort between the Command/Group and the Authority.



**AMC UAS.30(c) - Operations under a Standard Scenario**

1. If a Standard Scenario is to be employed by the Command/Group, the requirements of the Standard Scenario must be met in their entirety. Where an element of a Standard Scenario cannot be met, use of that Standard Scenario is precluded and the Command/Group must pursue a UASOP under DASR UAS.30(b).
2. The Command/Group's intention to operate a UAS under a Standard Scenario must be formally declared to the Authority prior to commencement of operations. Notification may be via email to **dasa.uas@defence.gov.au**. This declaration must include:
  - a. identification of the Command/Group accountable person responsible for authorising the operation
  - b. a description of the UAS
  - c. a description of the intended use of the UAS
  - d. a reference to the Standard Scenario/s under which the UAS shall be operated
  - e. the date or period of time that the operation is intended to occur (may be open ended)
  - f. a statement of compliance with the limitations and conditions applicable to the relevant Standard Scenario/s.
3. Authority acknowledgement of receipt of the declaration is not needed prior to first operation. There is also no need to re-declare to the Authority any subsequent intentions to operate that same UAS under the same Standard Scenario/s provided details in the original declaration remain unchanged.
4. **Amendment and Withdrawal.** Where the Authority elects to make a non-trivial amendment to a Standard Scenario, the Authority will notify all registered users of that Standard Scenario. The Authority will include in the notification any flexibility for the Command/Group in implementing the updated Standard Scenario. Where the Authority elects to withdraw a Standard Scenario, the Authority will individually negotiate a transitional arrangement until the issue of a UASOP, with each affected UAS Operator.

**UAS.35 – STANDARD SCENARIOS FOR UAS OPERATIONS**

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**UAS.35(a) Standard Scenario for Micro UAS.** UAS operations under the Micro UAS Standard Scenario shall comply with the following requirements and limitations:

1. UAS MTOW must not exceed 0.1 kg.
2. Not operate in a Prohibited Area.
3. Not operate in a Restricted Area unless approved by the authority controlling the area.
4. Not operate in such a manner as to create an obstruction to another aircraft.
5. Not operate over an aerodrome runway/movement area without approval from the relevant authority.
6. Not operate in the approach or departure path of a runway, landing area or ship without approval from the relevant authority.
7. Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.
8. Allow remote pilot intervention during all stages of the flight.
9. Employ suitable risk controls for operating:
  - (1) beyond visual line of sight
  - (2) outside of daylight hours
  - (3) in cloud or reduced visibility
  - (4) above 400 ft AGL.

**GM UAS.35.a**

1. **Purpose.** The purpose of this regulation is to provide an Authority-published Standard Scenario under which Micro UAS may be safely operated within Specific Type B category.
2. **Applicability.** This Standard Scenario may be applied to all UAS with MTOW not exceeding 0.1kg, provided that every requirement and limitation of the Scenario is met. UAS operations may include, but are not limited to, trials, training, Defence exercises, Defence Force assistance to the civilian authorities, and Defence operations.

**GM UAS.35.a(6)**

1. Approach and departure paths are considered three dimensional airspace and UA may operate under an approach/departure path provided the UA remains well clear of other aircraft at all times.

**AMC UAS.35.a(9)**

1. Operations permitted under Standard Scenario for Micro UAS require suitable risk controls to treat safety risks to other airspace users, people and critical infrastructure. This acceptable means of compliance provides the Command/Defence Group authorising UAS operations under this standard scenario the means to develop and/or employ suitable risk controls. These are grouped into technical, operational and RP training and management risk controls.

*Note: This AMC should not be interpreted as presenting a complete set of risk controls and additional controls may need to be implemented to eliminate or otherwise minimise risks so far as is reasonably practicable for Command/Group to meet their statutory obligations and for compliance with DASR UAS.10(b).*

**2. Technical risk controls.** Technical risk controls for this standard scenario should include design features that:

- a. trigger autonomous flight actions upon loss of datalink (eg Autonomous Recovery System (ARS), Go-Home mode)
- b. positively contain the UA within a pre-programmed volume (eg geo-fencing, tether, range limiter, programmable maximum and minimum altitude)
- c. enable the RP to locate and avoid GP/MEP (eg onboard EO/IR camera)
- d. enable manual termination of flight by the RP during emergencies.

*Note: Some technical risk controls might not be suitable for operations where tactical time constraints do not permit pre-programming. Alternate operational risk controls, documented in a specific instruction, should be developed for such operations.*

**3. Operational risk controls.** Operational risk controls for this standard scenario should include:

- a. pre-flight checks, carried out in accordance with documented OEM or locally produced procedures, that confirm the setup/functionality of:
  - (1) UA airframe and propellers/rotor blades
  - (2) navigation system
  - (3) technical risk controls (eg ARS, geo-fencing, altitude and range limiter, onboard camera)
  - (4) any other feature/system that may contribute to safe operation of the UAS.
- b. documented UA limitations, in a flight manual or equivalent document, that provide sufficient details on:
  - (1) range limits of the datalink
  - (2) limitations of technical risk controls (eg limitations of ARS, geo-fencing, altitude and range limiter, onboard camera)
  - (3) any other design feature that may contribute to safe operation of the UAS.
- d. planning and procedures for intended operational airspace, documented in an ATMP or equivalent document, that enable:
  - (1) de-confliction and safe separation from other airspace users
  - (2) co-ordination of operations with other airspace users when operating as part of a military exercise or operation.
- e. emergency procedures, documented in a flight manual or equivalent document, for any reasonably foreseeable event that creates a hazard to GP, MEP, critical infrastructure or other airspace users.
- f. emergency response procedures, documented in a local instruction, for the following events:
  - (1) loss of positive control
  - (2) UA escape from operational area/assigned airspace (eg alerting GP/MEP and/or other airspace users)

*Note: Some operational risk controls might not be suitable for operations where tactical time constraints do not permit the carrying out of required tasks/checks. Alternate operational risk controls, documented in a specific instruction, should be developed for such operations.*

**4. RP Training and Management risk controls.** RP training and management risk controls for this standard scenario should include:

- a. training that prepares the RP to:
  - (1) perform the required action/tasks for employing/programming technical risk controls
  - (2) perform the required pre-flight checks
  - (3) operate within the documented UA limitations

- (4) operate the UA in a way that minimises the risk to GP, MEP, critical infrastructure or other airspace users.
- b.** emergency procedure training that prepares the RP for all documented emergency procedures
- c.** RP qualification system that defines the requirements for training and experience.

**UAS.35(b) Standard Scenario for Very Small UAS. UAS operations under the Very Small UAS Standard Scenario shall comply with the following requirements and limitations:**

- 1. UAS MTOW must not exceed 2 kg.**
- 2. Not operate in a Prohibited Area.**
- 3. Not operate in a Restricted Area unless approved by the authority controlling the area.**
- 4. Not operate over an area where a fire, police or other public safety or emergency operation is being conducted without the approval of the person in charge of the operation.**
- 5. Not operate in such a manner as to create an obstruction to another aircraft.**
- 6. Not operate in controlled airspace higher than 400 ft AGL without approval of the relevant airspace authority.**
- 7. Not operate over an aerodrome runway/movement area without approval from the relevant authority.**
- 8. Not operate in the approach or departure path of a runway, landing area or ship without approval from the relevant authority.**
- 9. Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.**
- 10. For each air vehicle, have a dedicated remote pilot.**
- 11. Allow remote pilot intervention during all stages of the flight.**
- 12. Employ suitable risk controls for operating:**
  - (1) beyond visual line of sight**
  - (2) outside of daylight hours**
  - (3) in cloud or reduced visibility**
  - (4) above 400 ft AGL**
  - (5) within 30 m horizontally of GP**
  - (6) over populous areas**
  - (7) over or in proximity of critical infrastructure**
  - (8) within 3 nm of the movement area of a controlled aerodrome.**

**GM UAS.35.b**

1. **Purpose.** The purpose of this regulation is to provide an Authority-published Standard Scenario under which Very Small UAS may be safely operated within Specific Type B category.
2. **Applicability.** This Standard Scenario may be applied to all UAS with MTOW not exceeding 2 kg, provided that every requirement and limitation of the Scenario is met. UAS operations may include, but are not limited to, trials, training, Defence exercises, Defence Force assistance to the civilian authorities, and Defence operations.

**GM UAS.35.b(8)**

1. Approach and departure paths are considered three dimensional airspace and UA may operate under an approach/departure path provided the UA remains well clear of other aircraft at all times.

**AMC UAS.35.b(12)**

1. Operations permitted under Standard Scenario for Very Small UAS require suitable risk controls to treat safety risks to other airspace users, people and critical infrastructure. This acceptable means of compliance provides the Command/Defence Group authorising UAS operations under this standard scenario the means to develop and/or employ suitable risk controls. These are grouped into technical, operational and RP training and management risk controls.

*Note: This AMC should not be interpreted as presenting a complete set of risk controls and additional controls may need to be implemented to eliminate or otherwise minimise risks so far as is reasonably practicable for Command/Group to meet their statutory obligations and for compliance with DASR UAS.10(b).*

2. **Technical risk controls.** Technical risk controls for this standard scenario should include:
  - a. design features that:
    - (1) trigger autonomous flight actions upon loss of datalink (eg Autonomous Recovery System (ARS), Go-Home mode)
    - (2) positively contain the UA within a pre-programmed volume (eg geo-fencing, tether, range limiter, programmable maximum and minimum altitude)
    - (3) enable the RP to locate and avoid GP/MEP (eg onboard EO/IR camera)
    - (4) enable manual termination of flight by the RP during emergencies
    - (5) display remaining battery/fuel level to the RP at all times
    - (6) assist other aircraft to visually see the UA, where tactical constraints permit (eg lighting, hi-visibility colour scheme).
  - b. inspection, maintenance and testing that could prevent technical failures of the UAS, carried out at regular intervals in accordance with documented OEM or locally produced procedures (eg maximum airframe/propeller hours, battery servicing/replacement)

*Note: Some technical risk controls might not be suitable for operations where tactical time constraints do not permit pre-programming. Alternate operational risk controls, documented in a specific instruction, should be developed for such operations.*

3. **Operational risk controls.** Operational risk controls for this standard scenario should include:
  - a. pre-flight checks, carried out in accordance with documented OEM or locally produced procedures, that confirm the setup/functionality of:
    - (1) UA airframe, control surfaces and propellers/rotor blades
    - (2) navigation system
    - (3) technical risk controls (eg ARS, geo-fencing, altitude and range limiter, onboard camera)
    - (4) any other feature/system that may contribute to safe operation of the UAS.

- b. documented UA limitations, in a flight manual or equivalent document, that provide sufficient details on:
  - (1) UA endurance (eg battery/fuel limits and performance in different flight modes)
  - (2) range limits of the datalink
  - (3) weather limitations of the UA (eg not to operate in rain, wind gusts)
  - (4) limitations of technical risk controls (eg limitations of ARS, geo-fencing, altitude range limiter and onboard camera)
  - (5) any other design feature that may contribute to safe operation of the UAS.
- c. planning and procedures for intended operational airspace, documented in an ATMP or equivalent document, that enable:
  - (1) de-confliction and safe separation from other airspace users
  - (2) co-ordination of operations with other airspace users when operating as part of a military exercise or operation
  - (3) safe operation within 3 nm of a controlled aerodrome (eg obtaining ATC approval and/or notifying ATC).
- d. planning and procedures for intended operational area, documented in a local instruction, that enable the RP to:
  - (1) operate the UAS within its weather limitations (eg obtaining weather forecast, monitoring weather radar)
  - (2) maintain a 30 m horizontal distance from GP unless essential for mission/training requirements (eg area survey, planning of ARS routes, geo-fencing)
  - (3) remain clear of populous areas unless essential for mission/training requirements (eg area survey, planning of ARS routes, geo-fencing)
  - (4) remain clear of critical infrastructure (eg area survey, planning of ARS routes, geo-fencing setup, minimum operating altitude).
- e. specific procedures, documented in a local instruction, for operations:
  - (1) within 30 m horizontally of GP
  - (2) over populous areas
  - (3) over or in proximity of critical infrastructure.
- f. emergency procedures, documented in a flight manual or equivalent document, for the following events:
  - (1) change in weather conditions that could adversely affect the UA
  - (2) any other reasonably foreseeable event that creates a hazard to GP, MEP, critical infrastructure or other airspace users.
- g. emergency response procedures, documented in a local instruction, for the following events:
  - (1) loss of positive control
  - (2) UA escape from operational area/assigned airspace (eg alerting GP/MEP, other airspace users, ATC)

*Note: Some operational risk controls might not be suitable for operations where tactical time constraints do not permit the carrying out of required tasks/checks. Alternate operational risk controls, documented in a specific instruction, should be developed for such operations.*

**4. RP Training and Management risk controls.** RP training and management risk controls for this standard scenario should include:

- a. training that prepares the RP to:
  - (1) perform the required action/tasks for employing/programming technical risk controls
  - (2) perform the required pre-flight checks
  - (3) operate within the documented UA limitations

- (4) operate the UA in a way that minimises the risk to GP, MEP, critical infrastructure or other airspace users.
- b.** emergency procedure training that prepares the RP for all documented emergency procedures.
- c.** RP qualification system that defines the requirements for training and experience.



**UAS.35(c) Standard Scenario for Defence Ranges and Exercise Areas. UAS operations under the Defence Ranges and Exercise Areas Standard Scenario shall comply with the following requirements and limitations:**

1. Operate only in active (permanently or NOTAM) Restricted airspace that enables the exclusion of civilian aircraft from the area of operation. Restricted airspace may only be entered with approval of the relevant authority.
2. Operate only over Defence Controlled Land that excludes GP, or permits the UAS operator to ensure operations are not in the proximity of GP, or over water designated for a planned Defence exercise only during that exercise period.
3. UAS MTOW must not exceed 150 kg.
4. Not operate in a Prohibited Area.
5. Not operate over an area where a fire, police or other public safety or emergency operation is being conducted without the approval of the person in charge of the operation.
6. Not operate in such a manner as to create an obstruction to another aircraft.
7. Not operate over an aerodrome runway/movement area without approval from the relevant authority.
8. Not operate in the approach or departure path of a runway, landing area or ship without approval from the relevant authority.
9. Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.
10. For each air vehicle, have a dedicated remote pilot.
11. Allow remote pilot intervention during all stages of the flight.
12. Employ suitable risk controls for operating:
  - (1) beyond visual line of sight
  - (2) outside of daylight hours
  - (3) in cloud or reduced visibility
  - (4) above 400 ft AGL
  - (5) over or in proximity of MEP
  - (6) over or in proximity of vessels in the exercise area
  - (7) over or in proximity of critical infrastructure.

**GM UAS.35(c)**

1. **Purpose.** The purpose of this regulation is to provide an Authority-published Standard Scenario under which UAS may be safely operated in Defence Ranges and Exercise Areas within Specific Type B category.
2. **Applicability.** This Standard Scenario may be applied to all UAS with MTOW not exceeding 150 kg, provided that every requirement and limitation of the Scenario is met. UAS operations may include, but are not limited to, unit level training, Navy fleet exercises, and Joint Operations Command exercises. At all times, the UAS is to operate within Restricted airspace, and over

Defence controlled land, or water where Defence can ensure that operations are not in the proximity of the general public.

### GM UAS.35(c)1

1. UAS operation is confined to Restricted airspace that enables the exclusion of civilian aircraft; however, aircraft operated under DASR.NDR are permitted.
2. Clearance to enter Defence Range airspace must be granted by the range control/safety officer where applicable.

### GM UAS.35.(c)8

1. Approach and departure paths are considered three dimensional airspace and UA may operate under an approach/departure path provided the UA remains well clear of other aircraft at all times.

### AMC UAS.35(c)12

1. Operations permitted under Standard Scenario for Defence Ranges and Exercise Areas require suitable risk controls to treat safety risks to other airspace users, people and critical infrastructure. This acceptable means of compliance provides the Command/Defence Group authorising UAS operations under this standard scenario the means to develop and/or employ suitable risk controls. These are grouped into technical, operational and RP training and management risk controls.

*Note: This AMC should not be interpreted as presenting a complete set of risk controls and additional controls may need to be implemented to eliminate or otherwise minimise risks so far as is reasonably practicable for Command/Group to meet their statutory obligations and for compliance with DASR UAS.10(b).*

2. **Technical risk controls.** Technical risk controls for this standard scenario should include:
  - a. design features that:
    - (1) trigger autonomous flight actions upon loss of datalink (eg Autonomous Recovery System (ARS), Go-Home mode)
    - (2) positively contain the UA within a pre-programmed volume (eg geo-fencing, tether, range limiter, programmable maximum and minimum altitude)
    - (3) enable the RP to locate and avoid GP/MEP, vessels, critical infrastructure and terrain (eg onboard EO/IR camera)
    - (4) enable manual termination of flight by the RP during emergencies
    - (5) display remaining battery/fuel level to the RP
    - (6) enable the UA to be physically seen by other airspace users, where tactics permit (eg lighting, hi-visibility colour scheme).
  - b. inspection, maintenance and testing that could prevent technical failures of the UAS, carried out at regular intervals in accordance with documented OEM or locally produced procedures.
3. **Operational risk controls.** Operational risk controls for this standard scenario should include:
  - a. pre-flight checks, carried out in accordance with documented OEM or locally produced procedures, that confirm the setup/functionality of:
    - (1) UA airframe, control surfaces and propellers/rotor blades
    - (2) navigation system
    - (3) technical risk controls (eg ARS, geo-fencing, altitude and range limiter, onboard camera.)
    - (4) any other feature/system that may contribute to safe operation of the UAS.

- b.** documented UA limitations, in a flight manual or equivalent document, that provide sufficient details on:
  - (3) UA endurance (eg battery/fuel limits and performance in different flight modes)
  - (4) range limits of the datalink
  - (5) weather limitations of the UA (eg not to operate in rain, wind gusts)
  - (6) limitations of technical risk controls (eg limitations of ARS, geo-fencing, altitude and range limiter, onboard camera)
  - (7) any other design feature that may contribute to safe operation of the UAS.
- c.** planning and procedures for intended operational airspace, documented in an ATMP or equivalent document, that enable:
  - (1) containment of the UA within the assigned airspace (eg airspace buffers)
  - (2) de-confliction and safe separation from other airspace users
  - (3) co-ordination of operations with other airspace users when operating as part of a military exercise or operation
  - (4) communication with ATC.
- d.** planning and procedures for intended operational areas, documented in a local instruction, that enable the RP to:
  - (1) contain the UA within the operational area (eg area buffers)
  - (2) operate the UAS within its weather limitations (eg obtaining weather forecast, monitoring weather radar)
  - (3) remain clear of MEP (eg operational coordination, briefing for MEP, planning of ARS routes, geo-fencing)
  - (4) remain clear of areas where GP could be present (eg area survey, planning of ARS routes, geo-fencing)
  - (5) remain clear of vessels in the exercise area (eg detect and avoid with EO/IR data, area survey, planning of ARS routes, geo-fencing)
  - (6) remain clear of critical infrastructure (eg area survey, planning of ARS routes, geo-fencing setup, minimum operating altitude).
- e.** planning to avoid spectrum conflict and electromagnetic interference (eg coordination with relevant spectrum management authority, RF survey for high intensity emitters)
- f.** specific procedures, documented in a local instruction, for operations over or in proximity of:
  - (1) MEP
  - (2) vessels in the exercise area
  - (3) critical infrastructure.

*Note: AMC UAS.30(b) - Authority Requirements for Issue of a UASOP provides detailed guidance on aspects to be considered for risk assessment of operations over or in proximity of populations (GP/MEP) and critical infrastructure. This guidance should be followed to develop specific procedures in order to eliminate or otherwise minimise risks so far as is reasonably practicable, proportionate to the risk presented by intended operations.*
- g.** handover procedures, documented in a local instruction, that enable the RP to perform an effective handover to another RP (eg checklists, crew coordination, monitoring during handover)
- h.** emergency procedures, documented in a flight manual or equivalent document, for the following events:
  - (1) change in weather conditions that could adversely affect the UA
  - (2) intrusion by GP into the operational area
  - (3) intrusion by another airspace user into the assigned airspace
  - (4) any other reasonably foreseeable event that creates a hazard to GP, MEP, critical infrastructure or other airspace users.

- i.** emergency response procedures, documented in a local instruction, for the following events:
  - (1)** loss of positive control
  - (2)** UA escape from operational area/assigned airspace (eg alerting GP/MEP, other airspace users, ATC)
  - (3)** UA ground impact.
- 4. RP Training and Management risk controls.** RP training and management risk controls for this standard scenario should include:
  - a.** training that prepares the RP to:
    - (1)** perform the required action/tasks for employing/programming technical risk controls
    - (2)** perform the required pre-flight checks
    - (3)** operate within the documented UA limitations
    - (4)** operate the UA in a way that minimises risk to GP, MEP, critical infrastructure or other airspace users.
  - b.** emergency procedure training that prepares the RP for all documented emergency procedures.
  - c.** RP qualification system that defines the requirements for training and experience
  - d.** RP fatigue management system that defines crew requirements and restrictions on work hours
  - e.** RP workload assessment, resource planning and procedures.

**UAS.35(d) Standard Scenario for High Seas. UAS operations under the High Seas Standard Scenario shall comply with the following requirements and limitations:**

- 1. Operate no closer than 12 nm to land; except operations within 12 nm of rocks, shoals, and islands which have no permanent human inhabitants is permitted.**
- 2. UAS MTOW must not exceed 150 kg.**
- 3. Not operate in a Prohibited Area.**
- 4. Not operate in a Restricted Area unless approved by the authority controlling the area.**
- 5. Not operate over an area where a fire, police or other public safety or emergency operation is being conducted without the approval of the person in charge of the operation.**
- 6. Not operate in such a manner as to create an obstruction to another aircraft.**
- 7. Not operate in controlled airspace higher than 400 ft AMSL without approval of the relevant airspace authority.**
- 8. Not operate in the approach or departure path of a ship's runway/landing area without approval from the relevant authority.**
- 9. Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.**
- 10. For each air vehicle, have a dedicated remote pilot.**
- 11. Allow remote pilot intervention during all stages of the flight.**
- 12. Employ suitable risk controls for operating:**
  - (1) beyond visual line of sight**
  - (2) outside of daylight hours**
  - (3) in cloud or reduced visibility**
  - (4) above 400 ft AMSL**
  - (5) over or in proximity of MEP**
  - (6) over or in proximity of vessels**
  - (7) over or in proximity of critical infrastructure.**

**GM to UAS.35(d)**

1. **Purpose.** The purpose of this regulation is to provide an Authority-published Standard Scenario under which UAS may be safely operated on the High Seas (>12 nm from land) within Specific Type B category.
2. **Applicability.** This Standard Scenario may be applied to all UAS with MTOW not exceeding 150 kg, provided that every requirement and limitation of the Scenario is met. UAS operations may include, but are not limited to, trials, training, exercises and operations.

**GM to UAS.35(d)8**

1. Approach and departure paths are considered three dimensional airspace and UA may operate under an approach/departure path provided the UA remains well clear of other aircraft at all times.

**AMC to UAS.35.(d)12**

1. Operations permitted under Standard Scenario for High Seas require suitable risk controls to treat safety risks to other airspace users, people and critical infrastructure. This acceptable means of compliance provides the Command/Defence Group authorising UAS operations under this standard scenario the means to develop and/or employ suitable risk controls. These are grouped into technical, operational and RP training and management risk controls.

*Note: This AMC should not be interpreted as presenting a complete set of risk controls and additional controls may need to be implemented to eliminate or otherwise minimise risks so far as is reasonably practicable for Command/Group to meet their statutory obligations and for compliance with DASR UAS.10(b).*

2. **Technical risk controls.** Technical risk controls for this standard scenario should include:
  - a. design features that:
    - (1) trigger autonomous flight actions upon loss of datalink (eg Autonomous Recovery System (ARS), Go-Home mode)
    - (2) positively contain the UA within a pre-programmed volume (eg geo-fencing, tether, range limiter, programmable maximum and minimum altitude)
    - (3) enable the RP to locate and avoid GP/MEP, vessels, critical infrastructure and terrain (eg onboard EO/IR camera)
    - (4) enable manual termination of flight by the RP during emergencies
    - (5) display remaining battery/fuel level to the RP
    - (6) enable the UA to be physically seen by other airspace users, where tactics permit (eg lighting, hi-visibility colour scheme).
  - b. inspection, maintenance and testing that could prevent technical failures of the UAS, carried out at regular intervals in accordance with documented OEM or locally produced procedures.
3. **Operational risk controls.** Operational risk controls for this standard scenario should include:
  - a. pre-flight checks, carried out in accordance with documented OEM or locally produced procedures, that confirm the setup/functionality of:
    - (1) UA airframe, control surfaces and propellers/rotor blades
    - (2) navigation system
    - (3) technical risk controls (eg ARS, geo-fencing, altitude and range limiter, onboard camera)
    - (4) any other feature/system that may contribute to safe operation of the UAS.
  - b. documented UA limitations, in a Flight manual or equivalent document, that provide sufficient details on:
    - (1) UA endurance (eg battery/fuel limits and performance in different flight modes)

- (2) range limits of the datalink
  - (3) weather limitations of the UA (eg not to operate in rain, wind gusts)
  - (4) limitations of technical risk controls (eg limitations of ARS, geo-fencing, altitude and range limiter, onboard camera)
  - (5) any other design feature that may contribute to safe operation of the UAS.
- c.** planning and procedures for intended operational airspace, documented in an ATMP or equivalent document, that enable:
- (1) containment of the UA within the assigned airspace (eg airspace buffers)
  - (2) de-confliction and safe separation from other airspace users
  - (3) co-ordination of operations with other airspace users when operating as part of a military exercise or operation
  - (4) communication with ATC.
- d.** planning and procedures for intended operational area, documented in a local instruction, that enable the RP to:
- (1) contain the UA within the operational area (eg area buffers)
  - (2) operate the UAS within its weather limitations (eg obtaining weather forecast, monitoring weather radar)
  - (3) remain clear of MEP (eg operational coordination, briefing for MEP, planning of ARS routes, geo-fencing)
  - (4) remain clear of vessels unless essential for training/operational requirement (eg detect and avoid with EO/IR data, obtaining information on vessel traffic/routes, planning of ARS routes, geo-fencing)
  - (5) remain clear of critical infrastructure (eg obtaining information for operational area, planning of ARS routes, geo-fencing setup, minimum operating altitude).
- e.** planning to avoid spectrum conflict and electromagnetic interference (eg coordination with relevant spectrum management authority, obtaining information on high intensity RF emitters or expected ships)
- f.** specific procedures, documented in a local instruction, for operations over or in proximity of:
- (1) MEP
  - (2) vessels
  - (3) critical infrastructure.
- Note: AMC UAS.30(b) - Authority Requirements for Issue of a UASOP provides detailed guidance on aspects to be considered for risk assessment of operations over or in proximity of populations (GP/MEP) and critical infrastructure. This guidance should be followed to develop specific procedures in order to eliminate or otherwise minimise risks so far as is reasonably practicable, proportionate to the risk presented by intended operations.*
- g.** specific requirements, documented in a local instruction, for risks unique to embarked operations
- h.** handover procedures, documented in a local instruction, that enable the RP to perform an effective handover to another RP (eg checklists, crew coordination, monitoring during handover)
- i.** emergency procedures, documented in a flight manual or equivalent document, for the following events:
- (1) change in weather conditions that could adversely affect the UA
  - (2) intrusion by GP into the operational area
  - (3) any other reasonably foreseeable event that creates a hazard to GP, MEP, critical infrastructure or other airspace users.
- j.** emergency response procedures, documented in a local instruction, for the following events:
- (1) loss of positive control

- (2) UA escape from operational area/assigned airspace (eg alerting GP/MEP, other airspace users, ATC)
- (3) UA ship/vessel impact .

**4. RP Training and Management risk controls.** RP training and management risk controls for this standard scenario should include:

- a. training that prepares the RP to:
  - (1) perform the required action/tasks for employing/programming technical risk controls
  - (2) perform the required pre-flight checks
  - (3) operate within the documented UA limitations
  - (4) conduct embarked operations
  - (5) operate the UA in a way that minimises risk to GP, MEP, critical infrastructure or other airspace users.
- b. emergency procedure training that prepares the RP for all documented emergency procedures.
- c. RP qualification system that defines the requirements for training and experience
- d. RP fatigue management system that defines crew requirements and restrictions on work hours
- e. RP workload assessment, resource planning and procedures.



**UAS.35(e) Standard Scenario for Trials and Experimentation.** UAS operations under the Trials and Experimentation Standard Scenario shall comply with the following requirements and limitations:

1. Operate only in a Restricted Area that enables the exclusion of civilian and military aircraft operation, except those specifically planned as part of the trial.
2. Operate only over Defence Controlled Land, that excludes GP from entering the UAS area of operation, or over water where the UAS is not in the proximity of, or overhead, GP.
3. Not operate in a Prohibited Area.
4. Be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group.
5. Allow remote pilot intervention during all stages of the flight.
6. Employ suitable risk controls for operating:
  - (1) beyond visual line of sight
  - (2) outside of daylight hours
  - (3) in cloud or reduced visibility
  - (4) above 400 ft AGL
  - (5) over or in proximity of MEP
  - (6) over or in proximity of critical infrastructure
  - (7) more than one UA per remote pilot.

**GM to UAS.35(e)**

1. **Purpose.** The purpose of this regulation is to provide an Authority approved Standard Scenario under which UAS may be safely operated for the purposes of trials and experimentation within Specific Type B category.
2. **Applicability.** This Standard Scenario may be applied to all UAS, provided that every requirement and limitation of the Scenario is met. UAS trials/experimentation may include new aircraft/platforms, variation to equipment/sensor fit, new configuration, role, and environment (CRE), operational evaluation, and flight test. UAS operation must only be in Restricted airspace and in a sufficiently remote area, such that a catastrophic UAS failure is very unlikely to result in impact to a person.

**AMC to UAS.35(e)6**

1. Operations permitted under Standard Scenario for Trials and Experimentation require suitable risk controls to treat safety risks to other airspace users, people and critical infrastructure. This acceptable means of compliance provides the Command/Defence Group authorising UAS operations under this standard scenario the means to develop and/or employ suitable risk controls. These are grouped into technical, operational and RP training and management risk controls.

*Note: This AMC should not be interpreted as presenting a complete set of risk controls and additional controls may need to be implemented to eliminate or otherwise minimise risks so far as is reasonably practicable for Command/Group to meet their statutory obligations and for compliance with DASR UAS.10(b).*

2. **Technical risk controls.** Technical risk controls for this standard scenario should include design features that:

- a. trigger autonomous flight actions upon loss of datalink (eg Autonomous Recovery System (ARS), Go-Home mode)
- b. positively contain the UA within a pre-programmed volume (eg geo-fencing, tether, range limiter, programmable maximum and minimum altitude)
- c. enable manual termination of flight by the RP during emergencies.

*Note: Depending on the nature of the trial and the unique risks it presents, the need for additional technical risk controls (eg a fully independent flight termination system) should be critically assessed.*

**3. Operational risk controls.** Operational risk controls for this standard scenario should include:

- a. pre-flight checks, carried out in accordance with documented OEM or locally produced procedures, that confirm the setup/functionality of:
  - (1) UA airframe, control surfaces and propellers/rotor blades
  - (2) navigation system
  - (3) technical risk controls (eg ARS, geo-fencing, altitude and range limiter, onboard camera)
  - (4) any other feature/system that may contribute to safe operation of the UAS.
- b. documented UA limitations, in a Flight manual or equivalent document, that provide sufficient details on:
  - (1) range limits of the datalink
  - (2) limitations of technical risk controls (eg limitations of ARS, geo-fencing, altitude and range limiter, onboard camera)
  - (3) any other design feature that may contribute to safe operation of the UAS.
- c. planning and procedures for intended operational airspace, documented in an ATMP or equivalent document, that enable:
  - (1) containment of the UA within the assigned airspace (eg airspace buffers)
  - (2) co-ordination and deconfliction of operations with other airspace users when operating as part of a joint trial
  - (3) communication with ATC.
- d. planning and procedures for intended operational area, documented in a local instruction, that enable the RP to:
  - (1) contain the UA within the operational area (eg area buffers)
  - (2) remain clear of MEP (eg operational coordination, briefing for MEP, planning of ARS routes, geo-fencing)
  - (3) remain clear of critical infrastructure (eg area survey, planning of ARS routes, geo-fencing setup, minimum operating altitude).
- e. planning to avoid spectrum conflict and electromagnetic interference (eg coordination with relevant spectrum management authority, RF survey for high intensity emitters)
- f. specific procedures, documented in a local instruction, for operations:
  - (1) over or in proximity of MEP
  - (2) over or in proximity of critical infrastructure
  - (3) involving more than one UA per RP.

*Note: AMC UAS.30(b) - Authority Requirements for Issue of a UASOP provides detailed guidance on aspects to be considered for risk assessment of operations over or in proximity of populations (GP/MEP) and critical infrastructure. This guidance should be followed to develop specific procedures in order to eliminate or otherwise minimise risks so far as is reasonably practicable, proportionate to the risk presented by intended operations.*

- g.** handover procedures, documented in a local instruction, that enable the RP to perform an effective handover to another RP (eg checklists, crew coordination, monitoring during handover)
- h.** emergency procedures, documented in a flight manual or equivalent document, for the following events:
  - (1) intrusion by GP into the operational area
  - (2) intrusion by another airspace user into the assigned airspace
  - (3) any other reasonably foreseeable event that creates a hazard to GP, MEP, critical infrastructure or other airspace users.
- i.** emergency response procedures, documented in a local instruction, for the following events:
  - (1) loss of positive control
  - (2) UA escape from operational area/assigned airspace (eg alerting GP/MEP, other airspace users, ATC)
  - (3) UA ground impact.
- j.** briefing for MEP covering risks unique to the trial/experiment.

*Note: Depending on the nature of the trial and the unique risks it presents, the need for additional operational risk controls (eg a chase plane) should be critically assessed.*

**4. RP Training and Management risk controls.** RP training and management risk controls for this standard scenario should include:

- a.** training that prepares the RP to:
  - (1) perform the required action/tasks for employing/programming technical risk controls
  - (2) perform the required pre-flight checks
  - (3) operate within the documented UA limitations
  - (4) operate the UA in a way that minimises risk to GP, MEP, critical infrastructure or other airspace users
  - (5) identify and manage risks unique to the trial/experiment.
- b.** emergency procedure training that prepares the RP for all documented emergency procedures.
- c.** RP qualification system that defines the requirements for training and experience.

*Note: Depending on the nature of the trial and the unique risks it presents, the need for additional RP training and management risk controls (eg increased supervision) should be critically assessed.*

**UAS.40 – OPEN CATEGORY UAS**

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**UAS.40(a)** Micro, Very Small and Small UAS shall only be eligible for operation under Open Category if they comply with the requirements and limitations contained in the following Standard Operating Conditions:

1. **Micro UAS (< 0.1 kg) shall:**
  - (1) be operated within visual line of sight
  - (2) be operated no higher than 400 ft Above Ground Level (AGL)
  - (3) be operated during daytime and not in cloud
  - (4) not operate in a way that creates a hazard to another aircraft, person or critical infrastructure
  - (5) not operate in a Prohibited Area, or a Restricted Area unless approved by the authority controlling the area
  - (6) not operate in the movement area or the approach or departure path of a runway of an aerodrome/ship without approval from the relevant authority
  - (7) not operate in such a manner as to create an obstruction to an aircraft
  - (8) be controlled by a remote pilot who meets training, qualification and experience requirements defined by the relevant Command or Group
  - (9) allow remote pilot intervention during all stages of the flight.
2. **Very Small UAS (0.1–2 kg), in addition to the requirements and limitations for Micro UAS, shall:**
  - (1) not operate within 30 m of the general public (GP)
  - (2) not operate over populous areas
  - (3) not operate within 3 nm of the movement area of a controlled aerodrome without approval of the relevant airspace authority
  - (4) not operate over an area where a fire, police or other public safety or emergency operation is being conducted without the approval of the person in charge of the operation
  - (5) for each air vehicle, have a dedicated remote pilot.
3. **Small UAS (2–25 kg), in addition to the requirements and limitations for Very Small UAS, shall:**
  - (1) only operate over land/water controlled by Defence
  - (2) not operate in controlled airspace without approval of the relevant airspace authority.

**GM UAS.40(a) - Open Category**

1. **Purpose.** The purpose of this regulation is to permit the operation of Open category UAS without the need for Authority approval.

2. Where 'AGL' is used, this can also be read as 'Above Mean Sea Level (AMSL)' for operations over water.
3. The MTOW and limitations applied in DASR UAS.40(a) purposely mirror those of CASA. This promotes a common approach to small UAS regulation across the Australian aerospace sector. Given Defence is increasing its use of civilian UAS service providers (eg E&IG engaging civilian UAS operators for facilities inspections), the use of common regulations promotes a seamless approach.
4. The following departures from CASA regulations have been included in DASR UAS.40(a):
  - a. CASA's 'landowner' provision has been modified, whereby land controlled by Defence is considered equivalent to a landowner under CASA regulations. This applies equally to the 'waterspace' in an exclusion zone immediately surrounding a naval vessel.
  - b. CASA's preclusion of very small UAS operations within 3 nm of a controlled aerodrome under CASR Part 101 Excluded Category has been moderated. Since some Defence Bases encompass a Defence controlled aerodrome and some Defence Bases are within 3 nm of a civilian controlled aerodrome, it makes sense for certain UAS operations within these areas to be approved by the relevant airspace authorities.
  - c. CASA's preclusion of operating in a prohibited or restricted (RA3) areas has been moderated. As many of these areas are restricted due to Defence operations, and are under Defence control, it makes sense for certain UAS operations within these areas to be approved by the authority in control of the area.
  - d. While CASA does not require RP training or qualifications under their CASR Part 101 Excluded UAS regulation, this was not considered sufficient for the professional nature of Defence UAS operation.
  - e. CASA's requirement to hold relevant aeronautical radio qualifications for small UAS operations in controlled airspace, which may include some Defence bases, has been moderated. When obtaining approval from the relevant airspace authority, any requirements for airspace access would be negotiated.

#### **AMC UAS.40(a) - Operations under Open Category**

1. DASR UAS.40(a) presents explicit UAS weights (referring to maximum take-off weight (MTOW) and limitations on use. Where any of these limitations are exceeded, operations under Open category are not permitted.
2. UAS operated under Open category will not be included on the Defence Register, unless specifically directed by the Authority. They must, however, be included on a local register. A centralised register for each Service is recommended. When requested by the Authority, the Command/Group must be able to readily provide the Authority with a list of all UAS they have authorised to operate under Open category.

#### **AMC UAS.40(a)1(8) - RP Qualifications**

1. The relevant Command/Group retains the accountability for ensuring that RPs of UAS operating within the Open category are trained to a standard so that risks to personnel and critical infrastructure are eliminated or otherwise minimised as far as is reasonably practicable. This approach provides flexibility to Command/Groups in ensuring Open category UAS are controlled by suitably qualified personnel without placing undue limitations on the Command/Group's ability to conduct tasking.
2. The training standard for commercial civilian UAS RPs may provide the Command/Group with a useful benchmark.

#### **AMC UAS.40(a)2(3) - Operations near controlled aerodromes**

1. For civilian controlled aerodromes, permission must be obtained from the air traffic control service for the aerodrome.
2. For military controlled aerodromes, standing permissions should be sought where practicable and written approval must be obtained from the Senior Air Traffic Control Officer (SATCO) which includes:

- a.** details of the UAS
- b.** the operating unit
- c.** how the UAS operations will interact safely with other aviation activity,
- d.** provision for the ATS provider to suspend UAS operations for safety reasons.
- e.** the Command/Group position responsible for ensuring each RP abides by the requirements/limitations imposed by the SATCO.

## **UAS.50 – WEAPONISATION AND CARRIAGE OF PASSENGERS**

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### **UAS.50(a) Integration of weapons onto Defence UAS shall require approval by the Authority.**

#### **GM UAS.50(a) - Weaponised UAS**

1. **Purpose.** The purpose of this regulation is to provide additional safety assurance through Authority oversight of the airworthiness and operations elements of a weaponised UAS. It does not prescribe limitations on a commander's decision when or how to employ weapons once they are approved by the Authority.
2. Treatment of the risk of integrating weapons should include:
  - a. airworthiness of the carriage of the weapon on the unmanned aircraft
  - b. airworthiness of weapon release/separation
  - c. accuracy and integrity of targeting information provided by the UAS to the weapon
  - d. sufficiency of Flight Manual and other operations information provided to the RP.
3. Weapons include (but are not limited to):
  - a. bombs
  - b. missiles
  - c. cannons
  - d. guns
  - e. antipersonnel ordnance.
4. Weapons do not include:
  - a. laser pointers, spot trackers or designators
 

*Note: All safety risks from lasers require assessment and Command/Group authorisation to operate. Normal Defence procedures for laser safety clearance, per the Defence Radiation Safety Manual, apply*
  - b. short range anti-UAS measures such as nets or UA capture devices
  - c. SAR stores.

*Note: While these items are not classified as weapons, the Command/Group still retains the duty to ensure that anything dropped or discharged from an unmanned aircraft does not create a hazard to another aircraft, a person, or critical infrastructure. This inherently includes unintentional as well as intentional dropping/discharging, so safe carriage must also be assessed.*

### **UAS.50(b). Carriage of persons on Defence UAS shall require approval by the Authority.**

#### **GM UAS.50(b) - Carriage of Persons**

1. **Purpose.** The purpose of this regulation is to provide additional safety assurance through Authority oversight of the airworthiness and operations elements of UAS that are intended for carriage of persons.
2. Airworthiness and operations requirements for a UAS that will also carry persons will be determined on a case-by-case basis. For discretionary operations, the level of safety presented by manned aircraft airworthiness and operations regulations would normally be used by the Authority as a benchmark. For operations where the carriage of personnel on a UAS reduces total mission risk, for example SAR or battlefield medical evacuation, airworthiness and operations requirements would be derived through Authority and the Command/Group consultation.

## **UAS.60 – OCCURRENCE REPORTING**

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### **UAS.60(a) The operator of a UAS shall:**

- 1. report any identified condition of a UAS or any of its components which endangers flight safety**
- 2. establish an occurrence reporting system to enable collection and evaluation of safety occurrence reports.**

### **AMC UAS.60(a) - Occurrence Reporting**

- 1. Purpose.** The purpose of this regulation is to promote an appropriate DASR safety management reporting system, whilst not mandating all the occurrence reporting requirements of manned aircraft or DASR Basic Regulation.
- 2.** Where an unsafe condition occurs, it should be reported in a form and manner agreed by the Authority, as soon as practicable and in any case dispatched not later than 72 hours after the identification of the possible unsafe condition.
- 3.** The following formats are preferred:
  - a.** Form AE061 – Report on Aircraft and Aeronautical Product, for material related occurrences
  - b.** Aviation Safety Occurrence Report (ASOR) in accordance with AAP 6734.001 – Defence Aviation Safety Manual, for human factors related occurrences
  - c.** DASR Form 44 – Occurrence Report
  - d.** other reporting system as agreed with the Authority.
- 4.** Each report should contain at least the following information:
  - a.** Operator details
  - b.** information necessary to identify the UAS and/or component, including software version if applicable
  - c.** date and time relative to any life or overhaul limitation in terms of flying hours/cycles/landings, as appropriate,
  - d.** details of the occurrence
  - e.** any other relevant information found during the evaluation or rectification of the condition in the period set out in Para. 2 above.
- 5.** DASR BR.35 requires that Operators establish and maintain an accident prevention and safety program, including an occurrence reporting program, to aid in continually improving the safety of operations. While the BR is broadly applicable to UAS, it was specifically written for the manned aircraft context, and consequently in some circumstances may be unnecessarily onerous for Specific and Open category UAS. Accordingly, the requirements should be moderated per the following paragraphs.
- 6. Certified category UAS.** For Certified category UAS, an occurrence reporting system, meeting the entirety of DASR 21.A.3A, M.A.202 and 145.A.60, is required.
- 7. Specific category Type A UAS.** Specific category Type A can cover a wide scope of UAS sizes, designs and operations. Consequently, it is not practical to produce a single Occurrence Reporting AMC. In general terms, however, for UAS operating under a UASOP (Specific Type A), the Authority will define minimum occurrence reporting requirements as part of the UASOP approval process. The starting point for these requirements will be DASR 21.A.3A, M.A.202 and 145.A.60, but moderated to be commensurate with the particular UAS operating environment.
- 8. Specific category Type B UAS.** Specific category Type B can also cover a wide scope of UAS sizes, designs and operations. Occurrence reporting requirements should be commensurate with the particular UAS operating environment but it is not practical to produce requirements for every conceivable operation under Standard Scenarios. Requirements are therefore defined in general terms. Occurrence reporting to the Authority is only required when the Standard Scenario



requirements and limitations, and risk controls employed for operations allowed under that Standard Scenario, have provided an insufficient safety barrier to the risk, resulting in an incident involving, other airspace users, or people/critical infrastructure on the ground/water. Amongst other things this would include:

- a. failure of design features that:
    - (1) trigger autonomous actions upon loss of link
    - (2) positively contain the UA within a pre-programmed volume.
  - b. UA escape from operational area/assigned airspace
  - c. near misses with other aircraft
  - d. in-flight collision with another aircraft
  - e. near miss from a GP member
  - f. in-flight collision with a GP member
  - g. near miss from a MEP
  - h. in-flight collision with a MEP
  - i. near miss from critical infrastructure
  - j. in-flight collision with critical infrastructure.
9. **Open category UAS.** Occurrence reporting to the Authority for Open category UAS is only required when the Standard Operating Conditions have provided an insufficient safety barrier to the risk, resulting in an incident involving, other airspace users, or people/critical infrastructure on the ground/water. Amongst other things this would include:
- a. near misses with other aircraft
  - b. in-flight collision with another aircraft
  - c. in-flight collision with a GP member
  - d. in-flight collision with a MEP resulting in injury
  - e. in-flight collision with critical infrastructure.
10. The relevant Command/Group, as the body responsible for authorising Open category operations, should actively manage all UAS occurrences, beyond those listed above. This activity will contribute to the Command/Group's ongoing confidence that safety risks have been eliminated or otherwise minimised so far as is reasonably practicable. Adopting the following list, adapted from CASA AC 101-10, is not mandatory but provides contemporary guidance:
- a. a failure of the UAS to respond to flight commands from the RPS
  - b. failure of the flight control unit (i.e. inertial measurement unit, GPS, INS)
  - c. in-flight collision with any structure
  - d. in-flight collision with any MEP
  - e. UA structural failures
  - f. any damage caused by collisions/handling
  - g. near miss from a MEP or structure.

**UAS.70 – SUPPORT FOR AUTHORITY COMPLIANCE ASSURANCE**

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**UAS.70(a) All data and access necessary to support initial and ongoing compliance assurance of UAS operations shall be made available to the Authority.**

**GM UAS.70(a) - Support for Authority Compliance Assurance**

1. **Purpose.** The purpose of this regulation is to provide the Authority with access to data and facilities, required for aviation safety assurance activities.
2. The regulated community must regularly, and at any time on request from the Authority, provide to the Authority all data and access that will support the Authority undertaking, reviewing, monitoring and updating its Assurance functions. The Authority may from time to time request data as part of its safety assurance compliance and audit roles and in its administration of independent reviews such as Airworthiness Boards. The notification period for requesting data will be similar to that for safety assurance of manned aircraft; however, the data required will be commensurate to the complexity of the UAS operations.
3. The UAS Operator shall make arrangements that allow the Authority to make any investigation, including investigation of partners or subcontractors, necessary to determine compliance and continued compliance with the applicable requirements of DASR UAS.

**UAS.80 – FOREIGN UAS OPERATIONS**

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**UAS.80(a) Foreign military UAS shall have authorisation from an organisation within Defence prior to conducting flight operations in Australian airspace.**

**GM UAS.80(a) - Authorisation of Foreign Military UAS Operations**

1. **Purpose.** The purpose of this regulation is to require Defence to be aware of foreign military UAS operating in Australian airspace, and apply appropriate safety controls.
2. Foreign operators are not subject to the DASRs. However, a sponsor may require the foreign operator to operate in accordance with DASR provisions. Foreign operators are obliged to protect the safety of Australian airspace users and persons/critical infrastructure.
3. For a foreign military UAS to operate in Australia, it must be sponsored by an organisation within Defence. It is the responsibility of that sponsor to ensure the foreign military understands Australian statutory safety responsibilities, and for ensuring the safety of the proposed operations.
4. The level of safety implicit in DASR.UAS provides a suitable benchmark for the sponsor to execute their responsibilities. That is, a sponsor could identify which UAS category an equivalent Defence UAS would operate within, and use this equivalent Categorisation as a basis for assessing the foreign operator's risk controls. For example, where a foreign UAS operation is within the scope of a Specific category Standard Scenario, or within scope of the Open category, the sponsor could reasonably confirm each of the inherent risk controls for those categories has been implemented.
5. To assist in the above assessment, the sponsor could request relevant information from the foreign operator, including:
  - a. evidence and details of similar categorisation and approvals from another N/MAA
  - b. full disclosure of the scope of proposed operations in Australia
  - c. information on operational conditions and limitations placed on the UAS operations
  - d. confirmation that the RP has the skills commensurate with proposed airspace operations
  - e. any relevant risk assessments produced by the foreign operator
  - f. other documentation to assist the sponsor in drawing equivalence with DASR UAS.
6. Where the scope of foreign operations is commensurate with a Defence Specific category Type A UAS (and therefore, if this was a Defence UAS, it would require Authority issue of a UASOP), the sponsor assessment can become complex. The Authority cannot provide an Approval for the operation unless the foreign operator has agreed to be subject to DASRs. However, the DASA may be approached for SME advice.
7. Foreign militaries seeking to operate aircraft (in this paragraph, meaning manned and unmanned) in Australian airspace may require additional clearances that are separate to this regulation. Diplomatic approvals for foreign military or government aircraft are managed by the Diplomatic Clearance Cell within the Air and Space Operations Centre. Agencies involved in such clearances include the Department of Foreign Affairs and Trade. Foreign military flight operations within Australian airspace should be planned with an Australian Defence aviation command or HQJOC. A diplomatic clearance would normally be required for foreign military UAS operating outside of Defence areas.

**UAS.80(b) The organisation within Defence sponsoring foreign military UAS shall ensure the risks to other airspace users and persons/critical infrastructure are eliminated or otherwise minimised so far as is reasonably practicable.**

**GM UAS.80(b) - Risk Management of Foreign Military UAS Operations**

1. **Purpose.** The purpose of this regulation is to promote compliance by foreign UAS Operators and RP with Australian safety requirements, legislated in the Work Health and Safety Act 2011, and

reinforce that this compliance is to be ensured through the organisation in defence sponsoring the foreign operator.

2. The risk presented by foreign UAS to other airspace users (both Defence and civilian) or persons/critical infrastructure on the ground/water (both GP and MEP) must be eliminated or otherwise minimised so far as is reasonably practicable.

## NPA 04/2017 RESPONSE SHEET

### DEFENCE AVIATION SAFETY REGULATIONS FOR UNMANNED AIRCRAFT SYSTEMS (DASR UAS)

Please forward this sheet to DASA as an email attachment to [ACPA.Reggs@defence.gov.au](mailto:ACPA.Reggs@defence.gov.au) by 15 November 2017.

Please indicate your acceptance or otherwise of this proposal by ticking the appropriate box below. Additional comments, suggested amendments or alternative action are welcome and may be provided on this response sheet or by separate correspondence.

- The proposal is **acceptable without change**.
- The proposal is **acceptable but would be improved if the following changes were made**:
- The proposal is **not acceptable but would be acceptable if the following changes were made**:

LSN	NPA Reference: (ie Regulation number, NPA paragraph etc)	Comment or suggested change	Explanation
1			
2			
3			
4			
5			

#### RESOURCE IMPLICATIONS

Please provide specific comment on any significant resource implications that this proposal may have for your organisation, for both its implementation and ongoing compliance. Your comments should address both financial and human resource considerations.

Resource implications – Proposal implementation	
Resource implications – Proposal sustainment	

**RESPONDENT DETAILS**

<b>Your name:</b>	
<b>Submission date:</b>	
<b>Your organisation:</b>	
<b>Email address:</b>	
<b>Postal address:</b>	
<b>Phone:</b>	
<b>Whose views are represented in your response?</b>  <b>i.e. Is your response the authoritative response from your organisation?</b>	Responding on behalf of : Individual [ ] Regulated Military entity [ ] Regulated Commercial entity [ ] Wing HQ [ ] Group HQ [ ] ADF Regulatory, Technical or Logistics policy agency [ ] Other commercial entity [ ], Other [ ] Please describe:
<b>Do you consent to your name being published as an NPA respondent within the NPA Summary of Responses:</b>	YES [ ] NO [ ]