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UAS REGULATION

Self-paced Awareness Module

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DASR UAS – Background

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Global moves and our path

- Preference for alignment with EASA or CASA
  - EASA: Emerging benchmark, future EMAR compatibility
  - CASA: Single Australian approach
- Principles behind both regulation sets reasonably aligned
  - Both have a higher Type Certificated category
  - Both have middle (risk-based) categories that require Authority approval
  - Both have lower categories that don't require Authority approval
- Decision: Hybrid of both
  - Adapt EASA approach for Certified and Specific
  - Adapt CASA Excluded approach
  - Re-assess when EASA and CASA evolve their approach

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EASA vs. CASA Approach

	EASA				CASA		
	OPEN	**SPECIFIC**		**CERTIFIED**	**EXCLUDED**	**INCLUDED**	**AREA APPROVAL**
	No Auth	*No Auth*	*Auth Reqd*	*TC, RPL, ReOC*	*No Auth*	*Auth Reqd*	*Area Auth Reqd*
150kg+		if within standard scenarios	if outside standard scenarios	if risk beyond Specific		Type Certificate ReOC RePL	
25-150kg					VLOS Height < 120m Dist from pers > 30m Not populous Cont Aero > 3nm + landowner + RePL	Limitations, RP requirements and design requirements TBA	
2-25kg	**Cat A1, A2, A3** VLOS Height < 50/150m Dist from pers > 0/50m + equipage + design reqts				VLOS Height < 120m Dist from pers > 30m Not populous Cont Aero > 3nm + landowner	Limitations, RP requirements and design requirements TBA	
250g-2kg					VLOS Height < 120m Dist from pers > 30m Not populous Cont Aero > 3nm	Limitations, RP requirements and design requirements TBA	
100-250g	**Cat A0** Height < 50m Range < 100m Speed < 15m/s						
<100g					VLOS Height < 120m		

Categories of UAS Operation in DASR UAS

- Concept + naming from EASA prototype regulations
- Open category analogous to CASA Excluded

- Categories:
  - Certified
  - Specific
    - Type A – UASOP
    - Type B – Standard Scenario
  - Open
    - Small
    - Very small
    - Micro

CATEGORY	LIMITATIONS	INSTRUMENT
CERTIFIED	Airspace: unlimited* Ground: unlimited	MTC MAOC
SPECIFIC	**Standard Scenario #x:** <design>, <ops>, <RP training	(nil)
	Airspace: risk assessment + treatment Ground: risk assessment + treatment	UASOP
	Standard Scenario #2: <design>, <ops>, <RP training	(nil)
	Standard Scenario #1: <design>, <ops>, <RP training>	(nil)
OPEN	**Small (<25kg)**: "Very Small" limits, operate over Defence land/water, ops in controlled airspace require approval	
	Very Small (<2kg): "Micro" limits, >30m from GP, not over populous, <3nm from aerodrome requires approval, 1RP/UA	(nil)
	Micro (<100g): VLOS, <400', day VMC, not in Rest or movt areas (etc) without approval, RP trained	

* With equipage

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Categories of UAS Operation in DASR UAS

- Operate in Open if:
  - < 25 kg
  - Meets Standard Operating Conditions
- Operate in Specific Type B if:
  - Meets requirements of a Standard Scenario
- Operate in Specific Type A if:
  - Issued a Defence AA UASOP
- Operate in Certified if:
  - Meets similar requirements to manned aircraft

Standard Scenarios:
- < 100 g
- < 2 kg
- Defence exercises
- High seas
- Trials and experimentation

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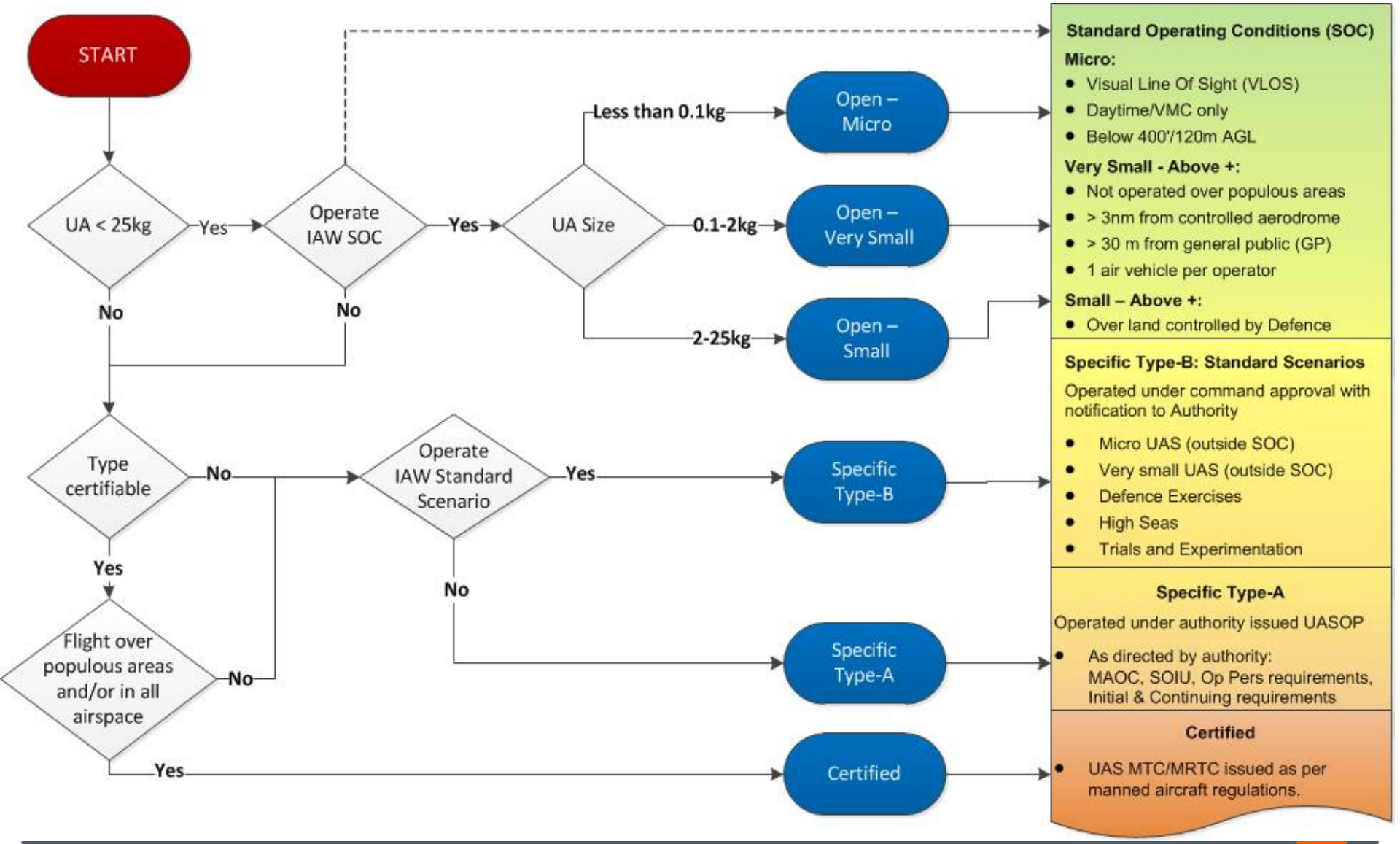

DASR UAS: Applicability

- DASR UAS is applicable to UAS operated by or on behalf of Defence
  - other than those regulated under DASR NDR.
- **These are UAS:**
  - unmanned targets
  - decoys
  - simulated weapons with a programmed or remote piloted flight path and which have a recoverable and reusable airframe.
  - (perhaps) disposable/one time use UA such as air dropped target
- **These are not UAS:**
  - guided missiles/rockets designed for single flight
  - guided weapons with a loiter capability*

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DASR UAS – The Regulations

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DASR UAS

UAS.10	**UAS Approval and Authorisation**
UAS.20	**Certified Category UAS**
UAS.30	**Specific Category UAS**
UAS.35	**Standard Scenario for UAS Operations**
UAS.40	**Open Category UAS**
UAS.50	**Weaponisation and Carriage of Passengers**
UAS.60	**Occurrence Reporting**
UAS.70	**Support for Authority Compliance Assurance**
UAS.80	**Foreign UAS Operations**

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UAS.10 - UAS Approval and Authorisation

- Provides GM on:
  - Concept of Authority Approval and Command Authorisation
  - Applicability
  - Definitions
- Requires all UAS operations to be authorised by Command or Defence Group
- Requires persons authorising and/or operating UAS to eliminate or otherwise minimise risks SFARP
- Requires all UAS to be operated IAW Certified, Specific or Open categories

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MEP, GP and Critical Infrastructure

MEP

- All persons directly associated with the operation of the UAS or briefed as part of the UAS mission

GP

- All persons not classed as Mission Essential Personnel

Critical Infrastructure

- A facility that, if damaged by a UA, may have an immediate and adverse effect on MEP or GP health and safety

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UAS.20 - Certified Category UAS

- Allowed to operate in all classes of airspace
  - Suitable equipage
  - Able to meet the same rules as manned aircraft
  - Capable of detect and avoid ?

- Allowed to operate over all populous areas
  - Meet requirements for Military Type Certification

Certified Category - Eligibility

- UAS eligible if they:
  - are Defence registered
  - have an SOIU
  - are Type Certified (per DASR 21)
  - comply with all initial and continuing airworthiness DASRs
  - are operated under a MAOC
  - comply with DASR Air Operations and Standard Rules of the Air regulation.
  - are controlled by a remote pilot who is:
    - a qualified military pilot, or
    - qualified in accordance with relevant service requirements.

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UAS.30 – Specific Category

- Operate under Specific Type B if a Standard Scenario covers the required operation.
- Operate under Specific Type A if no suitable Standard Scenario.

- **Specific Type A**
  - UASOP
  - Defence AA approval
  - Command authorisation

- **Specific Type B**
  - Standard Scenarios developed by DASA
  - Command authorisation

Eligibility – Specific Type A (UASOP)

- UAS eligible if they:
  - are registered as directed by the Authority
  - have its role and operating environment documented in an SOIU when directed by the Authority
  - comply with DASR initial and continuing airworthiness regulations to the extent directed by the Authority
  - Comply with MAO requirements of DASR ARO.100, to the extent directed by the Authority
  - comply with DASR under Air Operations and Standard Rules of the Air to the extent directed by the Authority
  - be controlled by a remote pilot who is qualified as specified in the UASOP
  - operate within the requirements and limitations included on the UASOP.

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DASA AC 001/2018 – Risk Controls for UAS Operations

- Applicants for a UASOP under DASR UAS.30 may utilise the list of candidate risk controls in AC 001/2018 to assist in identifying and applying robust and appropriate risk controls.

- Command/Group authorising UAS operations under other categories may also utilise the list of candidate risk controls in the AC 001/2018 to identify additional risk controls.

- AC 001/2018 provides:
  - a tool for identifying where risk controls might contribute to managing hazards presented by a particular UAS in a particular operating environment, and
  - a non-exhaustive list of candidate risk controls.

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Eligibility – Specific Type B (Standard Scenario)

- UAS eligible if they:
  - are operated under Standard Scenarios published by the Authority (ie within the requirements and limitations specified in the Standard Scenario)
  - are notified to the Authority prior to commencement of operations (via a Form 150).

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Standard Scenarios

- Essentially a collection of risk controls in the form of requirements and limitations
  - Would have warranted UASOP if proposed
- Provided all risk controls are in place, Command can authorise operations and notify Authority of intent to operate.

Published Standard Scenarios

- Found at DASR UAS.35
  - Regulation contains requirements and limitations
  - GM contains details on the use and applicability of the scenario
  - AMC contains details on risk controls (technical, operations and RP training and management)

- 5 initial Standard Scenarios :
  - Micro UAS outside SOC
  - Very small UAS outside SOC
  - Defence exercises
  - High seas
  - Trials and experimentation

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Standard Scenario – Micro UAS

- UAS < 0.1kg
- Operations outside Open category SOC
- Allows operations:
  - BVLOS
  - At night
  - In cloud
  - >400’ AGL
- Technical risk controls
  - Autonomous recovery system
  - Geo-fencing/tether
  - EO/IR cameras
  - Manual termination capability
- Operational risk controls
  - Pre-flight checks
  - Documented UA limitations
  - Emergency procedures
- RP training & qualification system

Standard Scenario – Very Small UAS

- UAS < 2kg
- Operations outside Open category SOC
- Allows operations:
  - BVLOS
  - At night
  - In cloud
  - >400' AGL
  - <30m from GP
  - Over populous areas
  - <3nm from controlled aerodrome
- Technical risk controls
  - Autonomous recovery system
  - Geo-fencing/tether
  - EO/IR cameras
  - Manual termination capability
  - Battery/fuel display
  - UA visibility features (eg lighting)
- Operational risk controls
  - Pre-flight checks
  - Documented UA limitations
  - Planning & procedures for airspace and operational area
  - Emergency procedures
- RP training & qualification system

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Standard Scenario – Defence Exercises

- UAS < 150kg
- Op in military restricted airspace
- Op over:
  - Defence controlled land OR
  - Water allocated for Defence exercise
- Allows operations:
  - BVLOS
  - At night
  - In cloud
  - >400’ AGL
  - Over vessels

- Tech risk controls
  - Autonomous recovery system
  - Geo-fencing/tether
  - EO/IR cameras
  - Manual termination capability
  - Battery/fuel display
  - UA visibility features (eg lighting)
  - Datalink redundancy
  - Backup power for RPS
  - Inspection and maintenance of UAS

- Op risk controls
  - Pre-flight checks
  - Documented UA limitations
  - Spectrum and EMI planning
  - Planning & procedures for airspace and operational area
  - Emergency procedures
  - Handover procedures
- RP training & qualification system, RP fatigue management

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Standard Scenario – High Seas

- UAS < 150kg
- Operations >12 nm from inhabited land
- Allows operations:
  - BVLOS
  - At night
  - In cloud
  - >400' AGL
  - Over vessels

- Tech risk controls
  - Autonomous recovery system
  - Geo-fencing/tether
  - EO/IR cameras
  - Manual termination capability
  - Battery/fuel display
  - UA visibility features (eg lighting)
  - Datalink redundancy
  - Backup power for RPS
  - Inspection and maintenance of UAS

- Op risk controls
  - Pre-flight checks
  - Documented UA limitations
  - Spectrum and EMI planning
  - Planning & procedures for airspace and operational area
  - Emergency procedures
  - Handover procedures
- RP training & qualification system, RP fatigue management

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Standard Scenario – Trials and Experimentation

- Operations in military restricted airspace
- Operations over Defence controlled land or range
- Not in vicinity of GP
- Allows operations:
  - BVLOS
  - At night
  - In cloud
  - >400’ AGL
  - More than one UA per remote pilot
- Tech risk controls
  - Autonomous recovery system
  - Geo-fencing/tether
  - Manual termination capability
- Operational risk controls
  - Pre-flight checks
  - Documented UA limitations
  - Spectrum and EMI planning
  - Planning & procedures for airspace and operational area
  - Emergency procedures
  - Handover procedures
- RP training & qualification system

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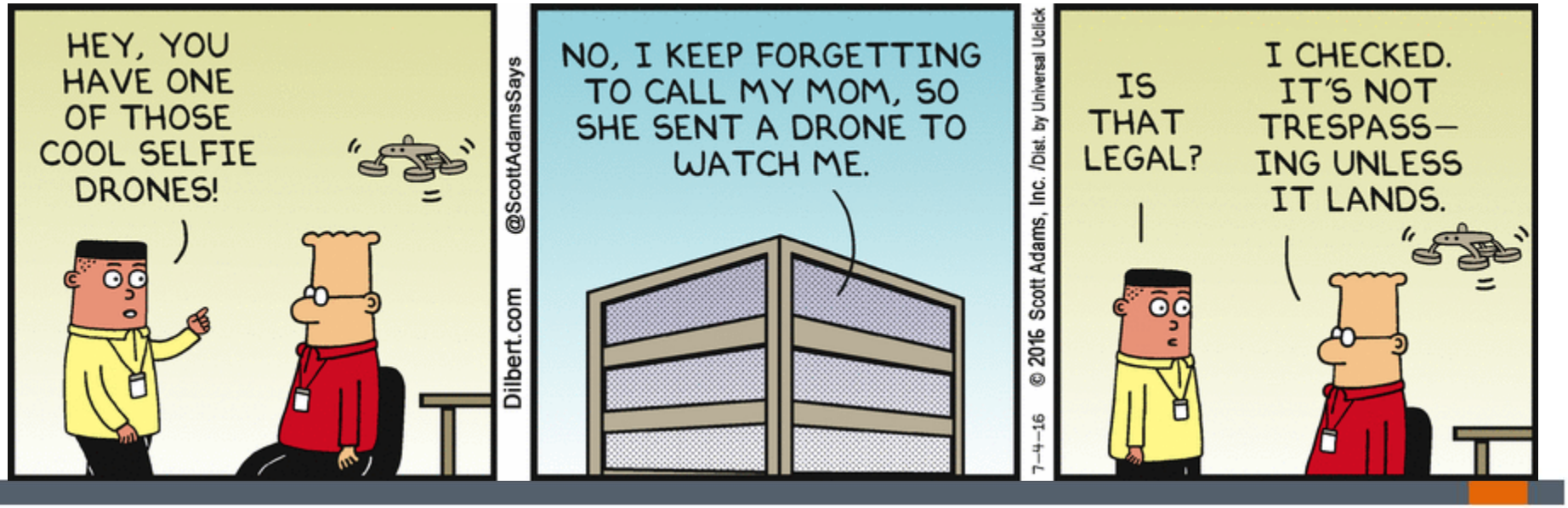
UAS.40 - Open category

- Can operate in Open Category if able to meet Standard Operating Conditions (SOC) for relevant weight class
  - Micro (< 0.1 kg)
  - Very Small (0.1 – 2 kg)
  - Small (2 – 25 kg)



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UAS.40 - Open category

Applicable to	Standard Operating Conditions
Micro **+** **Very Small** **+** **Small**	• be operated within **visual line of sight** • be operated no higher than **400 ft** Above Ground Level (AGL) • be operated during **daytime** and not in cloud • not operate in a way that creates a hazard to another aircraft, person or critical infrastructure • not operate in a Prohibited Area, or a Restricted Area unless approved by the authority controlling the area • 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. • not operate in such a manner as to create an obstruction to an aircraft • be controlled by a RP who meets training, qualification and experience requirements defined by the relevant Command / Group • allow RP intervention during all stages of the flight
Very Small **+** **Small**	• not be operated within **30 m of the general public** (GP) • not operate over **populous areas** • not operate **within 3 nm** (5.5 km) of the movement area of a **controlled aerodrome** without approval of the relevant airspace authority AMC • not operate over an area where a fire, police or other public safety or emergency operation is being conducted without approval of the person in charge of the operation • for each air vehicle, have a dedicated RP
Small	• only operate over **land / water controlled by Defence** • not operate in controlled airspace without approval of the relevant airspace authority

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UAS.50 - Weaponisation and Pax

- Weaponisation requires Authority approval
  - GM provides flexibility for inert stores
- Carriage of pax requires Authority approval
  - GM provides flexibility in level of safety

UAS.60 - Occurrence reporting

- Requires occurrence reporting
  - GM provides scaled down criteria for Specific and (especially) open category

UAS.70 - Compliance Assurance

- Support for Authority compliance assurance

UAS.80 - Foreign UAS operations

- Require Defence organisation authorisation
  - GM: no Authority Approval required

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	Certified	Specific		Open		
Category	**Certified**	**Specific A**	**Specific B**	**Small UAS <25kg**	**Very Small <2kg**	**Micro <0.1kg**
Is an Airworthiness Instrument required?	Yes. MTC/MRTC	Yes. UASOP	No. Command approval with notification to DASA	No. Command approval		
Is production and design organisation approval required?	Yes	May be	No	No		
Operational restrictions	No	Yes	Standard Scenario based	Standard Operating Conditions		
Populous Overfly	Yes	Subject to SFARP	Dependent on Standard Scenario	No		
Is continuing airworthiness organisation approval required?	Yes	May be	No	No		
Is maintenance organisation approval required?	Yes	May be	No	No		
UAS Operator Requirement	Mil Pilot	Specified in UASOP	Command discretion	Command discretion		

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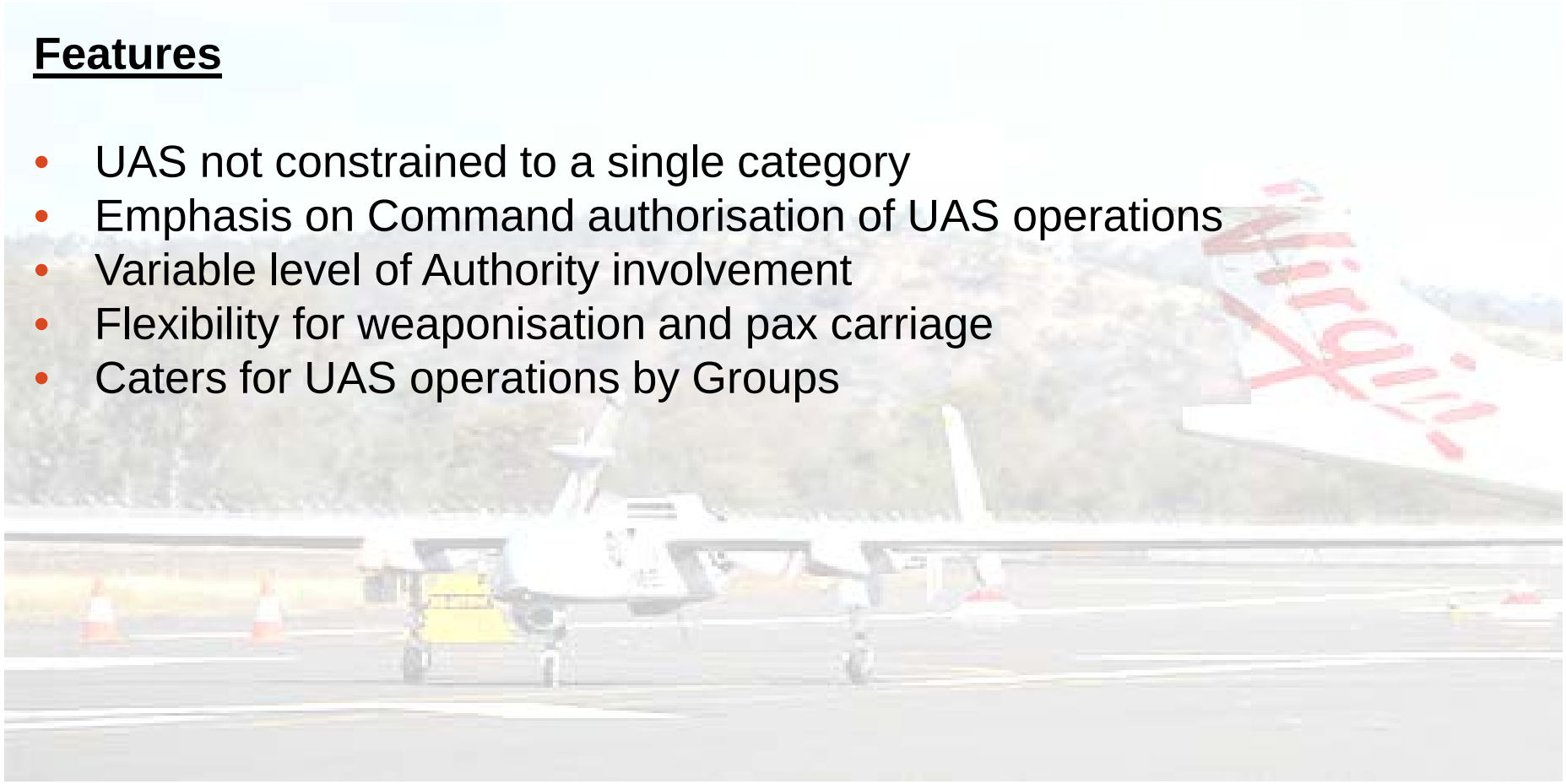
Features and benefits of DASR UAS

Features

- UAS not constrained to a single category
- Emphasis on Command authorisation of UAS operations
- Variable level of Authority involvement
- Flexibility for weaponisation and pax carriage
- Caters for UAS operations by Groups



Features and benefits of DASR UAS

Benefits

- Many UAS operations conducted without Authority-issued instrument
- Common nomenclature
- Compatible with emerging global UAS regulatory convention
- Commonalities with CASA for smaller UAS

QUESTIONS

Email: dasa.uas@defence.gov.au