

UNITED NATIONS RPAS/UAS CHALLENGES AND AVIATION SAFETY



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United Nations - Strategy for Emerging Technologies



The goal of the strategy is to define how the United Nations system will support the use of new technologies like artificial intelligence, biotechnology, blockchain, and robotics to accelerate the achievement of the 2030 Sustainable Development Agenda and to facilitate their alignment with the values enshrined in the UN Charter, the Universal Declaration of Human Rights, and the norms and standards of international law.

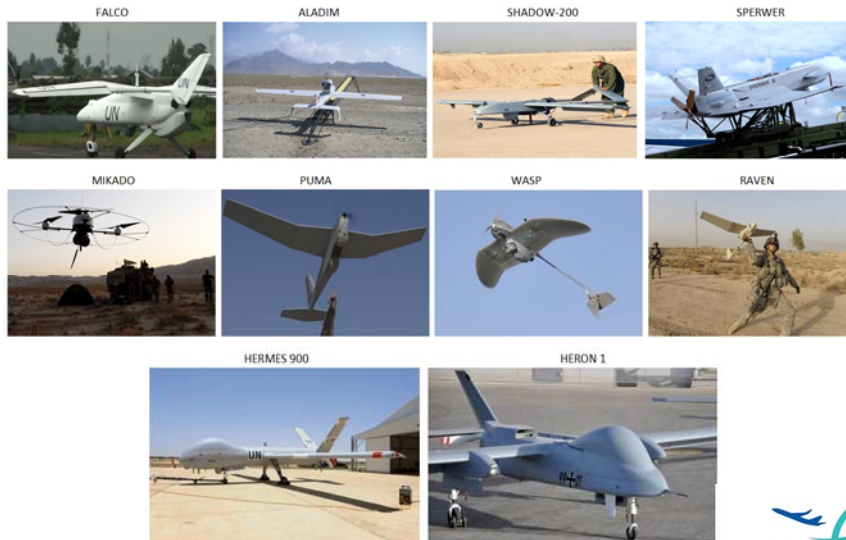
United Nations - vision for remote technologies

'We will need to work closely with new and current partners to overcome challenges and reconcile interests, especially in the areas of privacy and human rights, ethics, equality and equity, sovereignty and responsibility, and transparency and accountability'.

By United Nations Secretary General, Antonio Guterres



UN RPAS/UAS



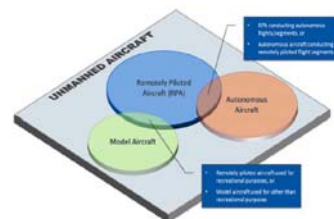
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UN Aviation Regulatory Framework

- Unmanned aircraft systems (UAS) and remotely piloted aircraft systems (RPAS) have had an increasingly important role in support of United Nations field missions on the implementation of their mission mandate.



- The utilization of unmanned aircraft must adhere to the Standards and Recommended Practices (SARPs) stipulated in the ICAO Annexes and documents, troop-contributing countries' military regulations and United Nations established applicable policies, procedures and practices.
- All Commercial and Military UAS/RPAS have to adhere to the UN Aviation and Aviation Safety regulatory requirements.

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UA/RPA Categories in UN



- Class I UAS: Small, mini and micro UAS, only operated up to a limited altitude of not more than 1,000ft above ground level (AGL), normally with a weight of between 1 and 25kg, and within radio line of sight (LOS) of the operator, with a maximum range of up to 50 km.
- Class II UAS/RPAS: Tactical UAS/RPAS, normally with a maximum take-off weight (MTOW) between 150kg and 600kg, equipped with a LOS data link. Normally Operated up to 10,000ft AGL, with a maximum range of 200km.
- Class III UAS/RPAS: Typically, MALE and HALE UAS/RPAS, normally weighing more than 600kg and operated up to 65,000ft AGL with unlimited range (beyond radio line of sight or BRLOS), equipped for limited or even unrestricted use of airspace with an equally less restrictive or even unrestricted airworthiness certificate.

UA/RPA Classification Table

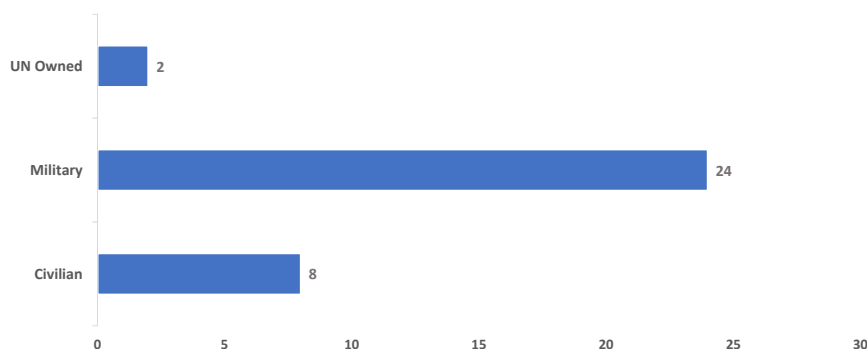


Class	Category	Recommended employment	Normal approximate operating altitude AGL	Range	Recommended C2 level	Examples
Class III	HALE	Strategic/national	<65,000 ft	Unlimited (BLOS)	AOR/mission	Global hawk
	MALE	Operational/theatre	<45,000 ft	Unlimited (BLOS)	AOR/mission	Heron 1/ Hermes 900
Class II	Tactical	Tactical formation	<18,000 ft	<200 km (LOS)	Brigade	Hermes 450/ Falco Sperwer
Class I	Small	Tactical unit	<1,000 ft	<50 Km (LOS)	Battalion/ regiment, sector	Scaneagle/ Shadow 200/ Luna
	Mini	Tactical sub-unit (manual or hand launch)	<1,000 ft	<25 Km (LOS)	Company, platoon, squad	Raven/Aladin/ Puma/ Skylark Heidrun V1
	Micro	Tactical sub-unit (manual or hand Launch, tethered)	<400 ft	<5km (LOS)	Platoon, squad, team	WASP III/MIKADO/ DJI Phantom 4, DJI Mavic Pro Hovermast-100

UA/RPA Type of Operators



UNMANNED AIRCRAFT SYSTEMS / REMOTELY PILOTED AIRCRAFT



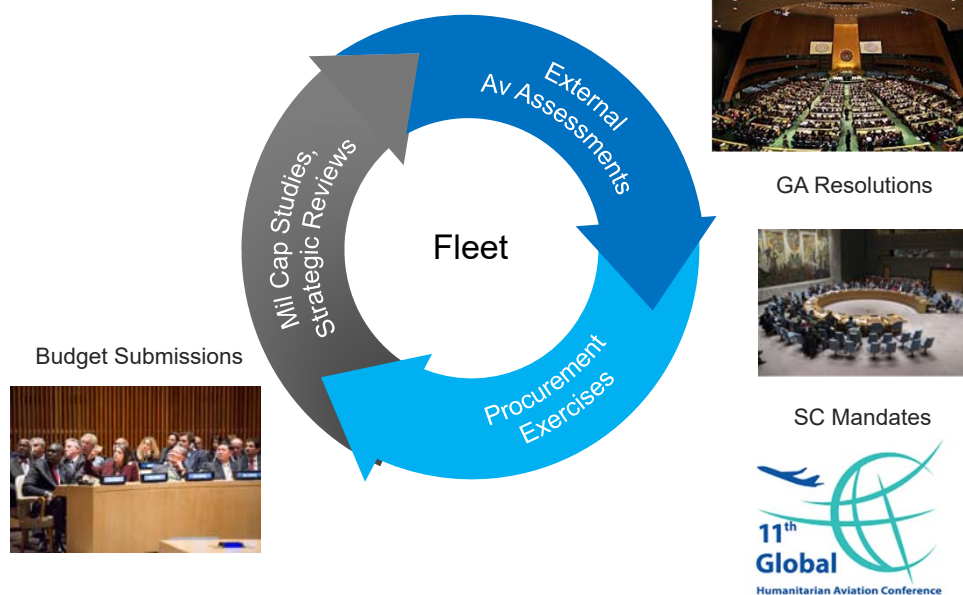
UN FLEET - UA/RPA



UN UNMANNED AIRCRAFT SYSTEMS

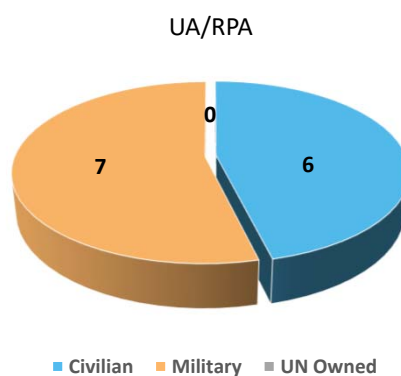
Aircraft	Mission	Location	Type	Operator
3	MINUSMA	Timbuktu	HERMES 900	UN - CONFD
2	MINUSMA	Timbuktu	PUMA	"
3	MINUSMA	Gao	RAVEN	"
3	MINUSMA	Kidal	RAVEN	"
10	MINUSMA	Gao	LUNA	"
4	MINUSMA	Gao	ALADIN	"
3	MINUSMA	Gao	HERON1	"
2	MONUSCO	Bunia	FALCO	"
1	MONUSCO	Goma	RESPONDER	"
3	MINUSCA	Bangui	ORBITER	"

REFINEMENT OF RPAS/UAS FLEET IS A CONTINUOUS PROCESS



UN UA/RPA

5 Year Accidents



UN UAS/RPA 5 Years Accidents



UAS/RPA 5 Years Accidents		
Date	Operator	Type
24-Aug-15	CONFD	Falco
16-Dec-15		Falco
4-Feb-16		Falco
29-Apr-16		Shadow
1-Jul-16		Luna
13-Jul-16		Accident
12-Sep-16		Shadow
5-Jul-17		Sperwer
6-Jul-17		Falco
14-Nov-17		Sperwer
13-Dec-17		Sperwer
26-Jan-18		Sperwer
20-Jul-18		Falco

UN UAS - Guidelines



United Nations Use of Unmanned Aircraft Systems (UAS) Capabilities Guidelines February 2019

These guidelines apply to United Nations Headquarters (UNHQ) staff, military commanders, staff officers and United Nations personnel in Field Missions. They are intended to provide an overview of the considerations when generating UAS capabilities to support UN missions. It defines the variety of UAS that may be tasked and the management of data generated by the UAS.

- These Guidelines provide:
 - UAS Classifications
 - Terminology
 - Regulatory
 - Deployment Considerations
 - Possible Tasks



UN UAS - Guidelines



United Nations Use of Unmanned Aircraft Systems (UAS) Capabilities Guidelines February 2019

- Deployment considerations
 - Operational Context
 - Command and Control.
 - Endurance and Range.
 - Infrastructure - Launch and Recovery.
 - Communication Architecture.
 - Logistics Support
 - Data Security and Storage.
 - Airspace considerations
- Force Generation
- UAS Safety

Safety Approach to UAS Acquisitions



SMS Filter

- UAS service providers shall have structured processes that obligates their organization to manage safety with the same level of priority that other core business processes are managed, as a formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls.
- UAS service provider's SMS shall include as a minimum the following components:
 - Safety Policy and Objectives
 - Safety Risk Management
 - Safety Assurance
 - Safety Promotion
 - Operational Procedures

Safety Approach to UAS/RPA Evaluation



- Aviation Safety Section, OSCM/DOS provides the most effective safety advice in a standardized, transparent and systematic manner to maximize safety performance and minimize potential safety liabilities to the Organization by analyzing all aspects of the Operators' SMS.
- AvSS uses comprehensive Check-Lists for UAS RFPs

Table 1: Assessment Score Key

Safety Assessment Score	Description	RFP Score
80-115 (RPAS) 70-95 (AOC)	Some safety concern identified but pose little or insignificant impact to aviation safety procedures or performance. The higher the safety assessment score, the less safety concerns identified.	
61-79 (RPAS) 50-69 (AOC)		
41-60 (RPAS) 34-49 (AOC)		
0-40 (RPAS) 0-33 (AOC)	One or more critical and/or ubiquitous important deficiencies exist in governance, risk management or safety control processes, such that reasonable safety assurance cannot be provided with regard to the achievement of control and objectives under review.	

7. Safety related Technical Specifications	7.1 Operator Certificate ROC/ AOC	Y / N	
	7.2 Lost Link & Recovery Procedure	Y / N	
	7.3 Air Space Integration Procedure	Y / N	
	7.4 Sense and Avoid Procedure	Y / N	
	7.5 Accident History and Statistics	Y / N	
Total: →			

Challenges

- Regulatory Gap. The States providing UAS/RPAS does not have regulations;
- Financial. High cost and limited PKO budgets for ISR, not suitable for logistic tasks;
- Operational Effectiveness. A big ???
- Technical. Secure networks - Data security, sharing and storage requirements;
- Logistics. Big logistic efforts to deploy, operate and maintain these capabilities;
- Legal/ Political. Misperceptions and legal/ political caveats (host nations, TCCs, etc);
- Generation of commercial/military. Complex and time consuming generation process.

Challenges



- CASEVAC/MEDEVAC. Future - Air Taxi or equivalent an option ?



What we do



- Support as SME's, UAS Cell at UNHQ;
- Outreach activities and operator evaluations;
- Contracting and contract management;
- Facilitate UN Missions and Offices seeking such capability;
- Coordinate OICT, DPO and other organizational efforts; and
- Create and update UN specific regulations to meet UN specific partners and stakeholders needs.



Thank You