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ENHANCING STANDARDS FOR UAS TRANSPORT OF DANGEROUS GOODS IN HEALTH, EMERGENCY AND HUMANITARIAN OPERATIONS

(Presented by African Civil Aviation Commission on behalf of 54 African States²)

EXECUTIVE SUMMARY

The accelerated integration of unmanned aircraft systems (UAS) into civil airspace has enabled the delivery of life-saving medical supplies and humanitarian aid in underserved and crisis-affected regions. However, current ICAO Standards and Recommended Practices (SARPs), particularly Annex 18 — *The Safe Transport of Dangerous Goods by Air* and the Technical Instructions (Doc 9284), remain primarily tailored to manned aviation. This limits the safe, scalable, and harmonized deployment of UAS for transporting Dangerous Goods (DGs), including vaccines, blood and medical oxygen.

This paper urges ICAO to initiate a structured revision of Annex 18, the Technical Instructions, and AC 102-37 to explicitly incorporate UAS-specific provisions for the transport of DGs. Additionally, it proposes strengthening the ICAO U-AID guidance to include a humanitarian ethics assessment framework and a humanitarian drone code of conduct.

This initiative is not only timely but essential, as the global demand for equitable, rapid-response logistics through UAS grows. ICAO leadership is required to ensure that the regulatory framework keeps pace with innovation, while safeguarding safety, ethics, and operational integrity.

<i>Strategic Goals:</i>	This working paper relates to the Strategic Goals <i>Every Flight is Safe and Secure</i> ; and <i>Aviation delivers Seamless, Accessible, and Reliable Mobility for All</i> .
<i>Financial implications:</i>	To be determined.
<i>References:</i>	Annex 18 — <i>The Safe Transport of Dangerous Goods by Air</i> Doc 9284, <i>Technical Instructions for the Safe Transport of Dangerous Goods by Air</i> ICAO Advisory Circular (AC) 102-37 ICAO U-AID Framework EASA and FAA UAS Regulations

¹ English and French versions provided by AFCAC.

² Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.

1. INTRODUCTION

1.1 The increasing adoption of unmanned aircraft systems (UAS) in medical and humanitarian logistics and supply chain management underscores the need for ICAO to update Annex 18 — *The Safe Transport of Dangerous Goods by Air* and Doc 9284, *Technical Instructions for the Safe Transport of Dangerous Goods by Air* to address UAS-specific operational factors such as beyond visual line of sight (BVLOS) operations, payload limitations and automated fleet management. Furthermore, ethical deployment of UAS in humanitarian endeavors requires clear operational guidelines. Expanding ICAO's U-AID to include a structured ethics framework will help safeguard responsible and transparent practices in humanitarian missions.

1.2 This working paper identifies gaps affecting the use of UAS in medical and humanitarian logistics and proposes updates to Annex 18 and the Technical Instructions, and revisions to AC 102-37. Additionally, it advocates for a reinforced U-AID framework to ensure UAS operations adhere to ethical and humanitarian principles while maintaining global aviation safety standards.

2. DISCUSSION

2.1 Regulatory gaps in ICAO SARPs for UAS transport of Dangerous Goods

- a) lack of UAS-specific provisions in Annex 18 limits the integration of Dangerous Goods transport via UAS;
- b) technical Instructions (Doc 9284) require adaptation to reflect UAS payload constraints, flight automation, and remote operation; and
- c) AC 102-37, while advisory, needs strengthening to guide States in harmonizing national regulations.

2.2 Implications for humanitarian and medical logistics

- a) UAS are increasingly used to transport high-priority medical DG: blood, organs, vaccines, antivenoms;
- b) in humanitarian contexts, delays in approvals due to lack of UAS-specific SARPs can be life-threatening; and
- c) the absence of global norms introduces safety, liability, and insurance uncertainties for operators and regulators alike.

2.3 Proposed updates to ICAO frameworks

2.3.1 Annex 18 and Doc 9284:

- a) define risk-based UAS DG categories based on size, payload, and operation type (e.g. BVLOS);
- b) introduce UAS-specific exemptions for certified humanitarian and emergency medical DG missions; and
- c) enable digital documentation, dynamic labeling (e.g. QR codes), and lightweight packaging tailored to drone payloads.

2.3.2 Advisory Circular 102-37:

- a) codify global minimum standards for UAS DG transport, including pilot qualifications, flight planning, and risk assessment; and
- b) promote alignment with European Aviation Safety Agency (EASA) and Federal Aviation Administration (FAA) frameworks for cross-border DG UAS operations.

2.3.3 U-AID framework expansion:

- a) introduce an ethics assessment checklist to ensure transparency, neutrality, and community engagement;
- b) develop a humanitarian drone code of conduct, grounded in humanitarian principles and data protection; and
- c) recommend best practices for inter-agency coordination, community consultations, and accountability.

3. CONCLUSIONS

3.1 Robust and forward-thinking ICAO SARPs are essential to fully unlock the potential of UAS in medical and humanitarian logistics. By updating Annex 18 and the Technical Instructions, and revising AC 102-37, ICAO can address UAS-specific operational requirements and establish a harmonized approach that prioritizes safety, security, and sustainability. Moreover, expanding U-AID initiative to include a dedicated ethics assessment framework and a humanitarian drone code of conduct, will ensure the alignment of UAS operations with humanitarian principles. With these measures, UAS can become a transformative force in global aid efforts, delivering critical supplies where they are needed most while upholding international safety and ethical standards.

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