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RPAS and Airships in Humanitarian operations

ICAO – WFP Aviation Safety Campaign

03 March 2023

Agenda

- The need for innovation in humanitarian cargo transportation
- WFP Humanitarian Cargo UAS Ecosystem development
- The study for Cargo Airship solutions
- The challenges for humanitarian UAS implementation
- Coordination with ICAO for UAS regulation harmonization
- WFP internal UAS regulation development

The need for innovation in humanitarian cargo transportation

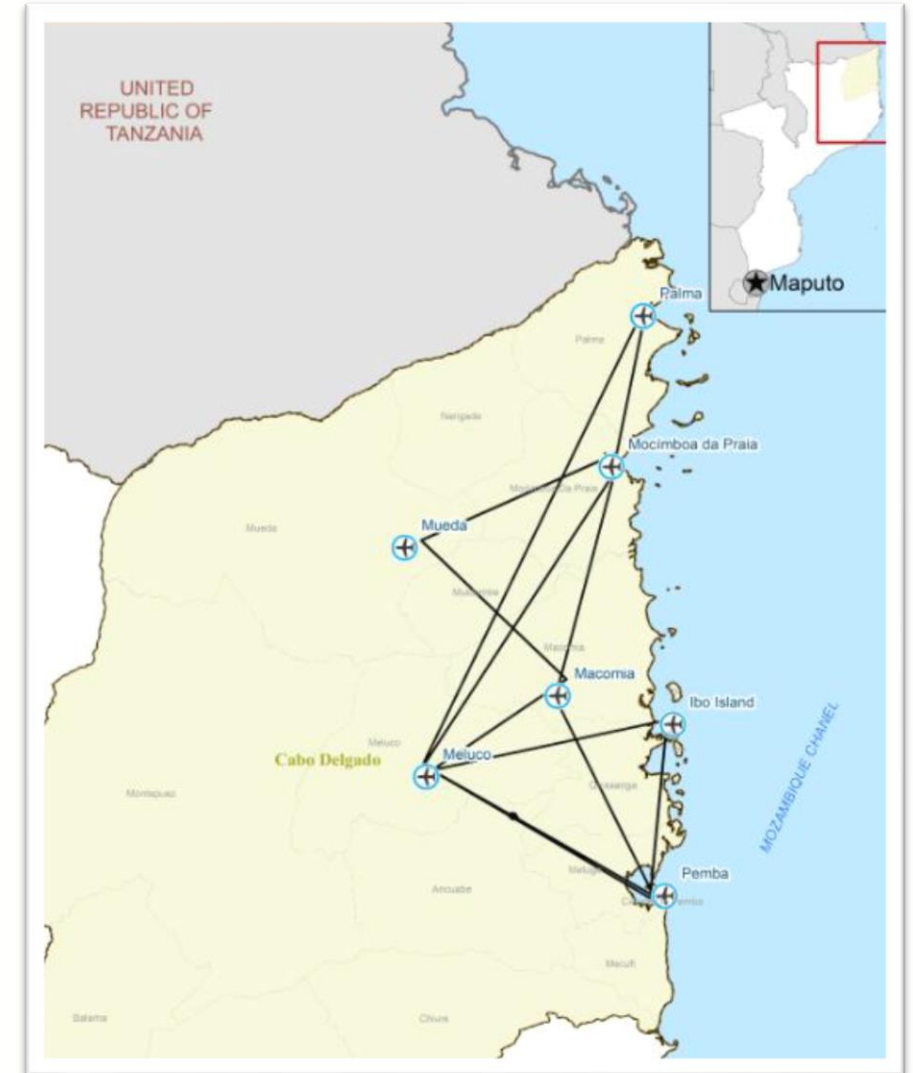
- During 2022, WFP supported 140 million people across 120 countries, distributed 4.7 million metric tons of food.
- We often operate in precarious security conditions, where no safe surface transport or viable commercial aviation options are available, supporting the entire Humanitarian Community.
- The remotely piloted aircraft system unlocks untapped potential for the “last-mile” delivery of food and other life-saving cargo to populations in remote locations, where the use of traditional aircraft is not cost-efficient, or insecurity poses significant security and safety threats to the operation of manned air assets.
- Airship technology would allow WFP to improve agility and flexibility of cargo delivery through all seasons while optimizing the cost of delivery and reducing the environmental impact.

WFP Humanitarian Cargo UAS Ecosystem development



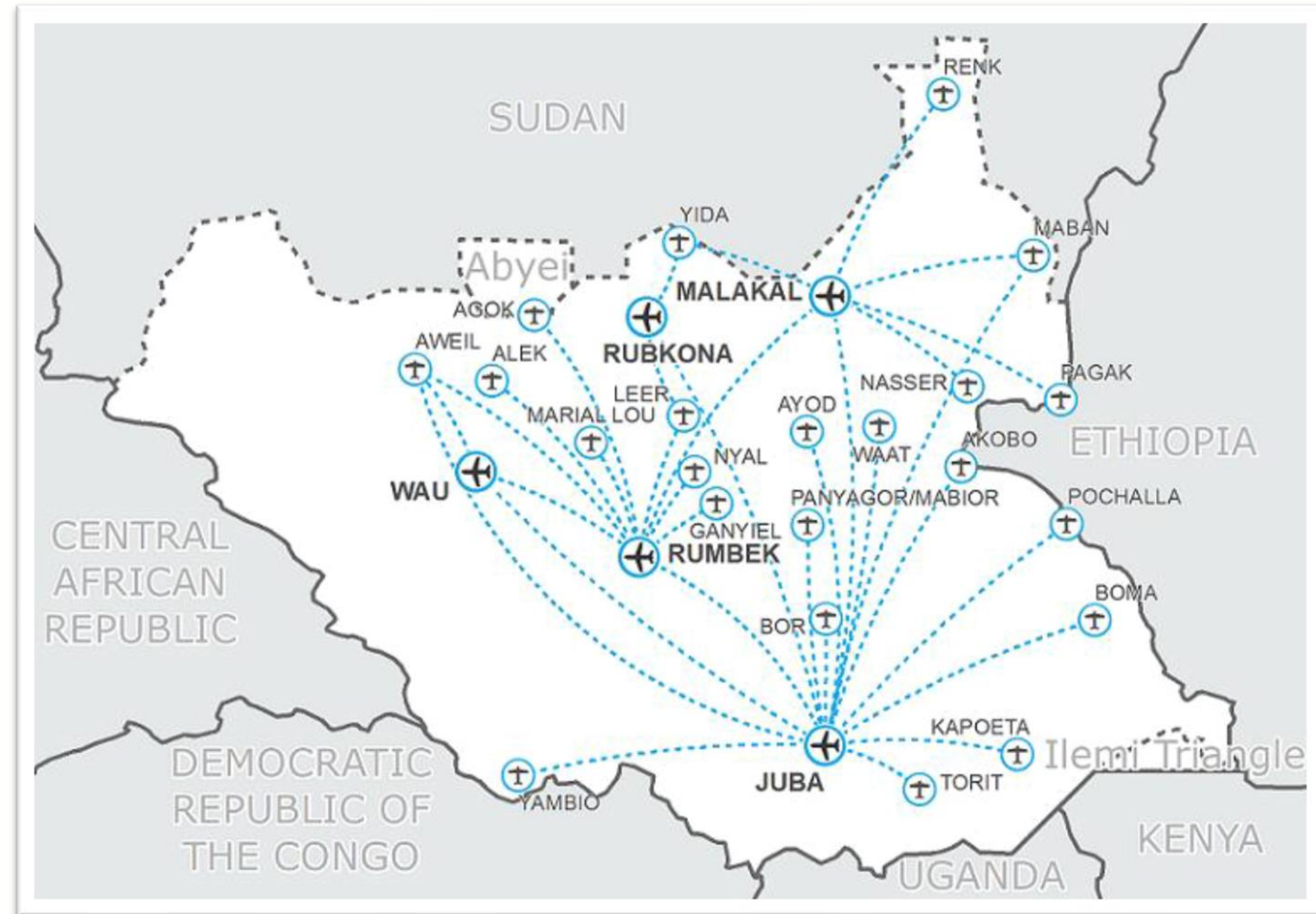
Humanitarian Cargo UAS opportunity in Mozambique

- UNHAS performs operations in Cabo Delgado province of Mozambique
- Strategy to have UAS Operator approval in South Africa and operational follow-up approval in Mozambique
- About 90 ROC holders are registered in South Africa
- Small Cargo UAS are approved by CAA for humanitarian operations in Mozambique

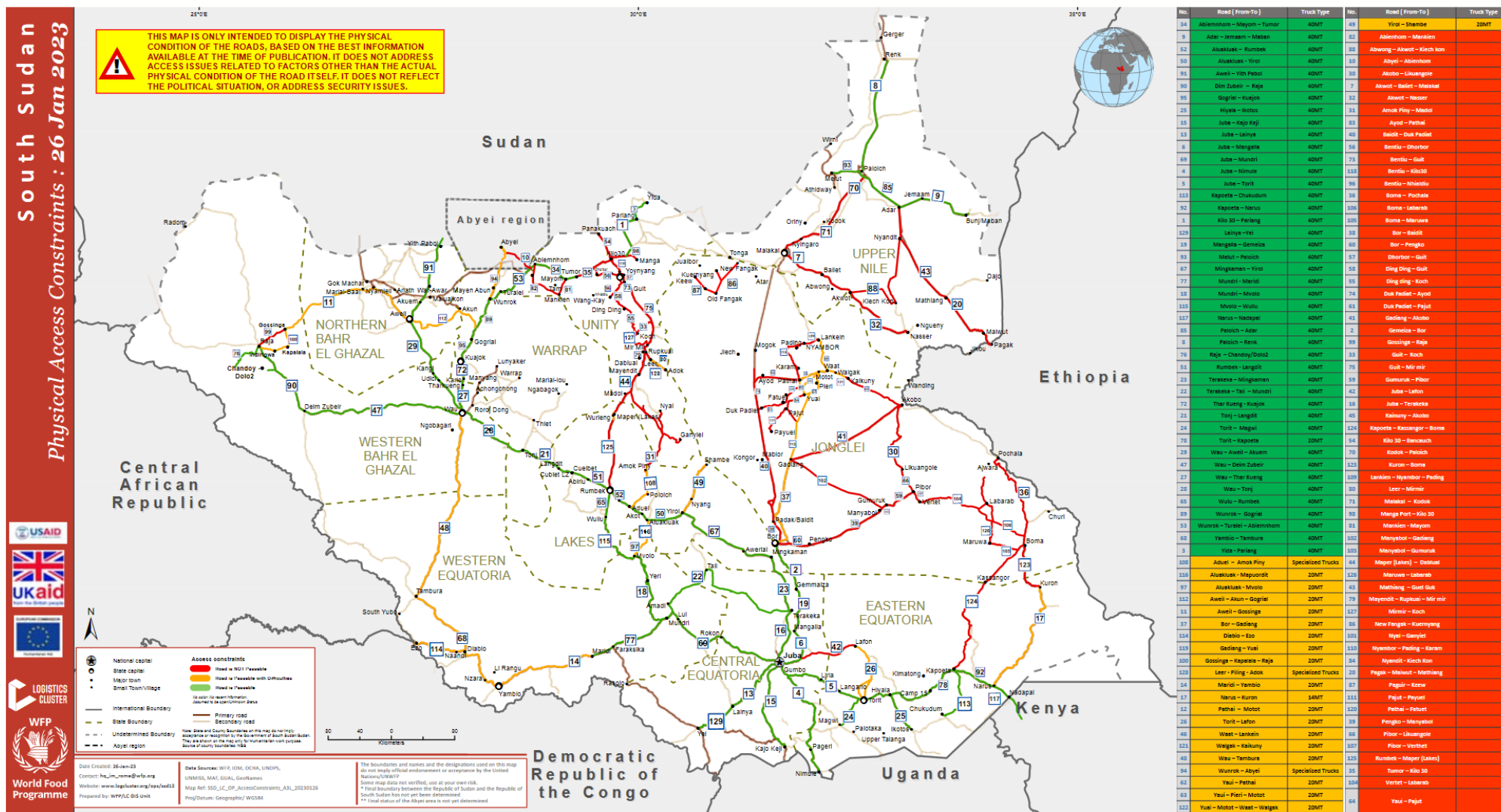


Humanitarian Cargo UAS opportunity in South Sudan

- UNHAS performs extensive operations in South Sudan
- Strategy to have UAS operator approval in Kenya and operational follow-up approval in South Sudan
- About 9 ROC holders registered in Kenya



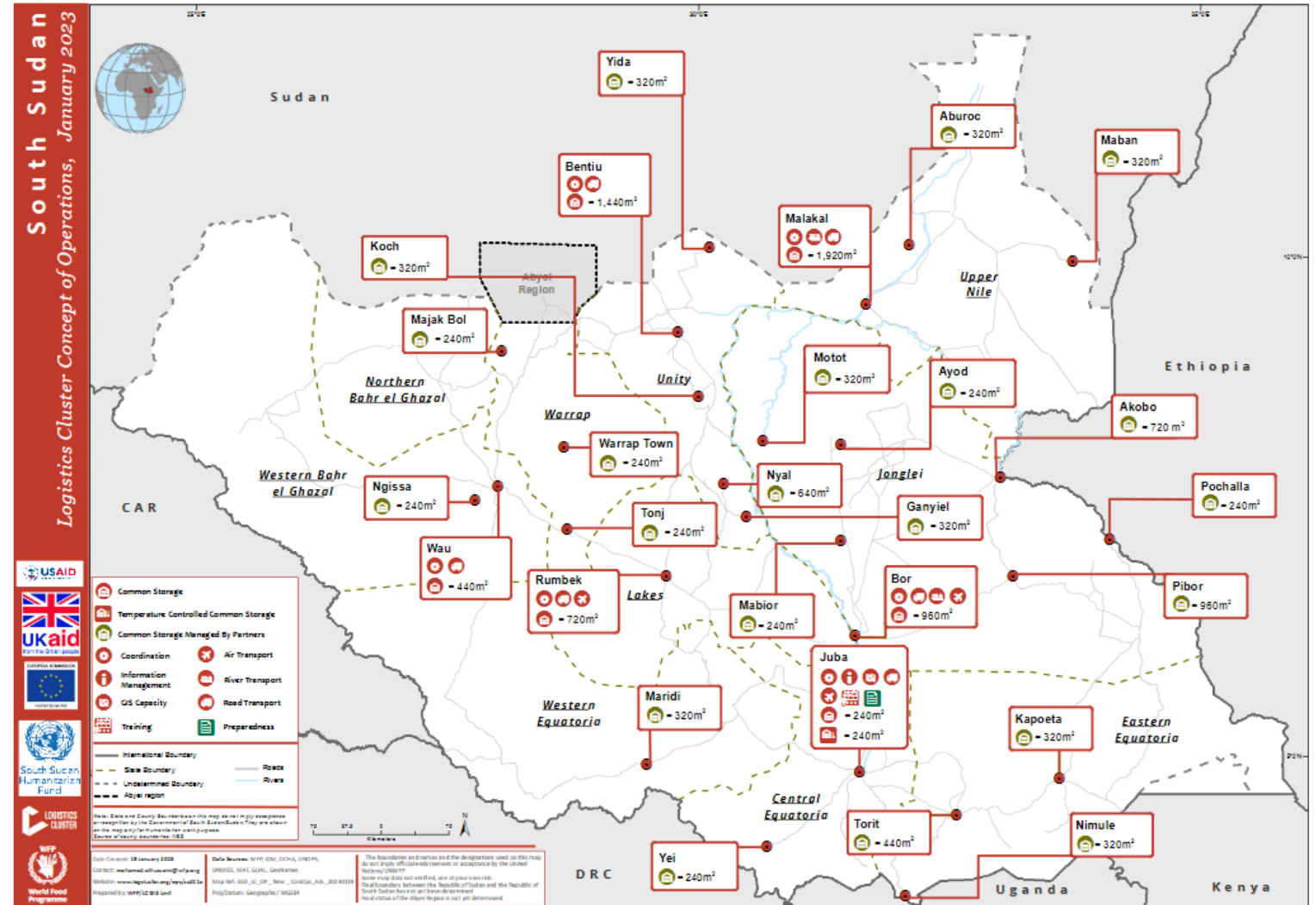
The study for Cargo Airship solutions (1/2)



Source: <https://logcluster.org/document/south-sudan-concept-operations-map-january-2023>

The study for Cargo Airship solutions (2/2)

- About 100,000MT of cargo delivered by WFP in Dry Season (3 months) – roads, barges
- About 50,000MT of cargo delivered by WFP during Wet Season (9 months) – barges, air



Source: <https://logcluster.org/document/south-sudan-concept-operations-map-january-2023>

Opportunities and challenges for Cargo Airship technology implementation

Needs & Opportunities

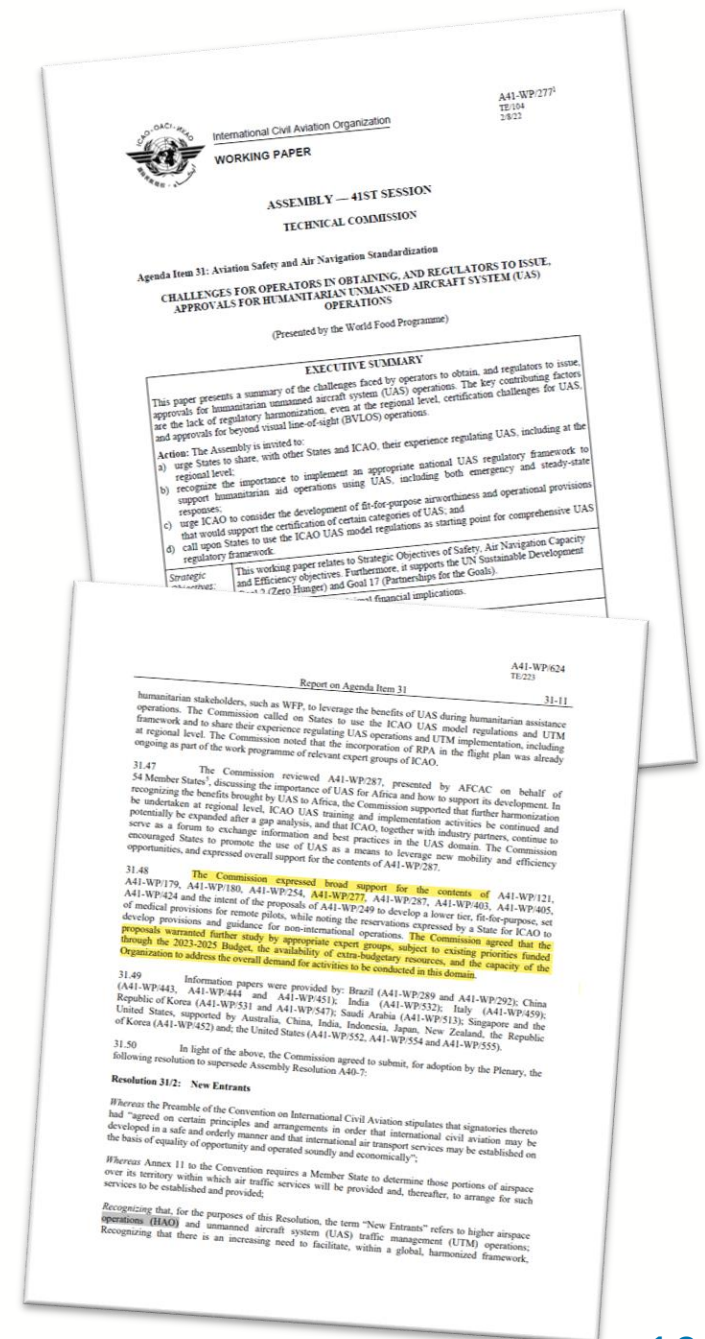
- +25MT vertical lift to pick-up the containers
- Ability to airdrop +10MT of cargo
- Cargo volume for food density ($<0.3 \text{ MT/m}^3$)
- Cost improvement for air delivery
- Reduction of fuel consumption
- Reduction of CO_2 emission

Challenges

- Availability of ballast for fixed buoyancy airships
- Ballast / stability management during airdrop
- Helium (working gas) local availability and cost
- Security aspects (cruising altitude, threats survivability)

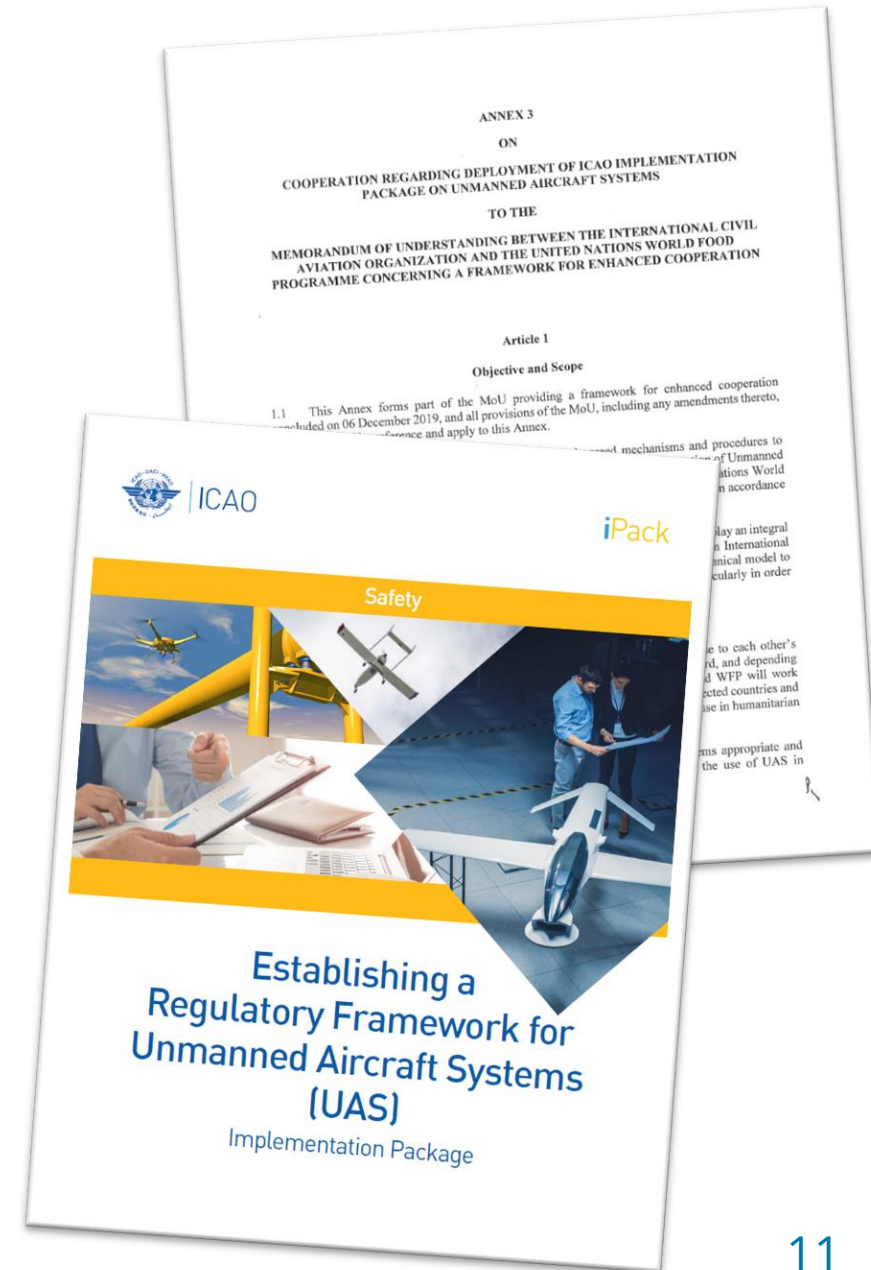
The challenges for humanitarian UAS implementation

- The working paper 277 presented by WFP of ICAO Assembly 41 presents a summary of the challenges faced by operators to obtain, and regulators to issue, approvals for humanitarian unmanned aircraft system (UAS) operations.
- The key contributing factors are the lack of regulatory harmonization, even at the regional level, certification challenges for UAS, and approvals for beyond visual line-of-sight (BVLOS) operations.
- ICAO has issued Working Paper A41-WP/624 stating that “The Commission expressed broad support for the contents of ... A41-WP/277 ... <and> agreed that the proposals warranted further study by appropriate expert groups, subject to existing priorities funded through the 2023-2025 Budget ...”.



Coordination with ICAO for UAS regulation harmonization

- To promote safe integration of UAS into the airspace for selected countries WFP and ICAO have prepared UAS Annex for WFP-ICAO MOU. This Annex 3 signed in Nov 2022.
- Based on this Annex for WFP-ICAO MOU, UAS iPack implementation initiated by ICAO with Mozambique CAA and with support of WFP. iPack implementation process officially started Jan 16, 2023.



WFP internal UAS regulation development

- Jun 2022 WFP has implemented an internal Directive on Operation of Unmanned Aircraft Systems (UAS) within WFP.
- This Directive is applicable to all WFP personnel and categorized UAS operations in accordance with their purpose – Cargo Delivery or Data and Connectivity Operations – and as to their Maximum Take-Off Mass (MTOM) and operated speed.
- Any UAS operations requiring UAS to deliver or airdrop any cargo, or UAS with MTOM greater than or equal to 25 kg must be outsourced to external UAS operators listed by WFP Aviation Safety Unit (ASU) in the WFP UAS List of Registered Air Operators (ULORA).
- ASU also performs pre-assessment for other types of UAS operations conducted by all WFP personnel.

Thank you

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