ICAO GLOBAL DEVELOPMENTS
Surveillance

Mie Utsunomiya
Technical Officer, CNSS (CNS and Spectrum), ICAO HQ

Surveillance

Surveillance Technologies Planning & Implementation

Surveillance Panel (SP)

The Surveillance Panel (SP) was tasked by the ICAO Air Navigation Commission to undertake specific studies and to develop technical and operational ICAO provisions for aeronautical surveillance systems, collision avoidance systems and their applications as outlined in the Global Air Navigation Plan.

TOR for the SP

[...]
Objectives
1) Develop and maintain SARPS and guidance materials covering the procedural and technical aspects of:
    a) airborne and ground based aeronautical surveillance systems
    b) airborne collision avoidance systems (ACAS)
    c) related facilities and systems
    d) airborne surveillance capabilities (e.g. AIRB, VSA and SURF)
    e) advanced airborne surveillance applications (e.g. interval management and airborne separation)
    f) ground based safety nets
2) Develop provisions for detect and avoid capability for Remotely Piloted Aircraft (RPA) in coordination with the RPASP

[...]

Surveillance Panel Membership

The SP comprises technical specialists

Nominated by:

- Australia
- Brazil
- Canada
- China
- France
- Germany
- India
- Italy
- Japan
- Kenya

- Nigeria
- Russian Federation
- Saudi Arabia
- Singapore
- South Africa
- Sweden
- Thailand
- United Kingdom
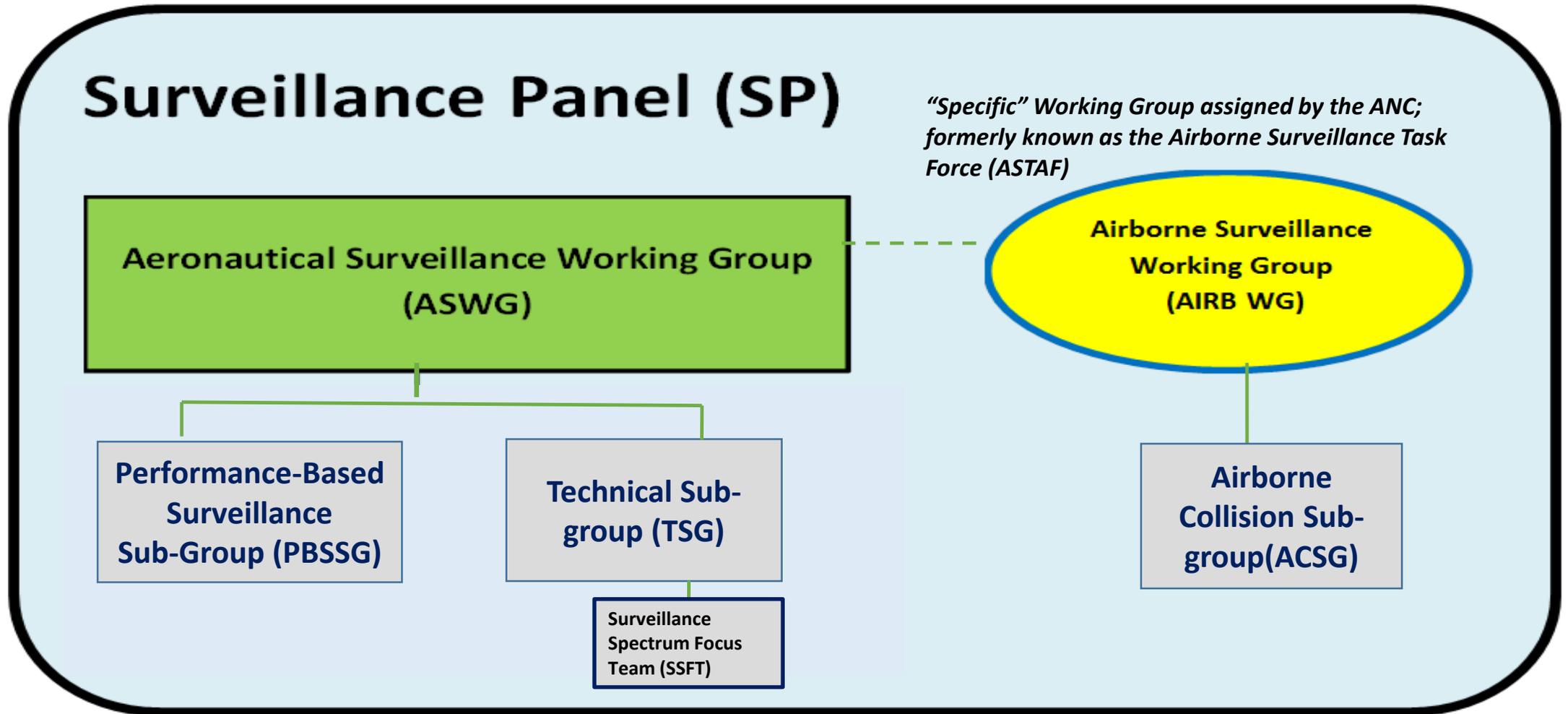- United States

also nominated from

- CANSO
- EUROCONTROL
- IATA
- ICCAIA
- IFALPA
- IFATCA

- 19 States

- 6 International Organizations

+ An observer nominated from RTCA

Panel Structure

New job card	Tasks details
SP.008.02 Ensure performance of Surveillance and ACAS systems	1. Update and maintain Annex 10 Volume IV and Volume III (relating to 24-bit aircraft addresses) and other ICAO documents based on operational experience.
	2. Develop provisions aimed at lowering interference levels on 1030/1090 MHz.
	3. Ensure compatibilities between new ACAS and existing ACAS
	4. Investigation of new surveillance technologies for air traffic management use
	5. Updated information related to surveillance systems included in the Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual.
	6. Develop measurable technical performance specifications for surveillance systems and update information on ADS-B versions 1 and 2 as well as WAM definitions included in Cir 326
SP.009.02 ACAS-X	New generation of collision avoidance systems
SP.010.02	Interval Management
SP.012.02	Enhanced traffic situational awareness on the surface of airport with indications and alerts (SURF- IA)

The fourth Meeting of
the Surveillance Panel (SP/4) was held in April 2022

JOB CARD	SP ASWG Tasks	Target date	WP/IPs discussed after SP/3 (Sep 2018)	Approved PfA/CPs at SP/4
SP.008.02	Ensure performance of Surveillance and ACAS systems	2023 (Annex) 2025 (other guidance materials)	More than 180 WPs/IPs	6 PfAs/CPs
SP.009.01	Develop provisions on ACAS-X	2022	More than 15 WPs/IPs	

| JOB CARD	SP AIRB WG Tasks	Target date	WP/IPs discussed after SP/3	PfA /CPs at SP/4
SP.010.02	Interval Management	Q4 2024	More than 30 WP/IP (Also entire review on Doc 9994 was conducted)	
SP.012.02	Enhanced traffic situational awareness on the surface of airport with indications and alerts (SURF- IA)	Q4 2021	5 WP/IPs	

SP/4 OUTCOMES
PfA :24-bit aircraft address

Proposal for Amendment (PfA) to Annex 10 *Aeronautical Telecommunications*, Volume III — *Communication Systems* PART I — *DIGITAL DATA COMMUNICATION SYSTEMS relating to 24-bit aircraft address, including:*

a) refinement of provisions related to aircraft address assignment;

b) increasing State allocation of aircraft addresses; and

c) deletion of unused registers F1 and F2.

03/03/2017
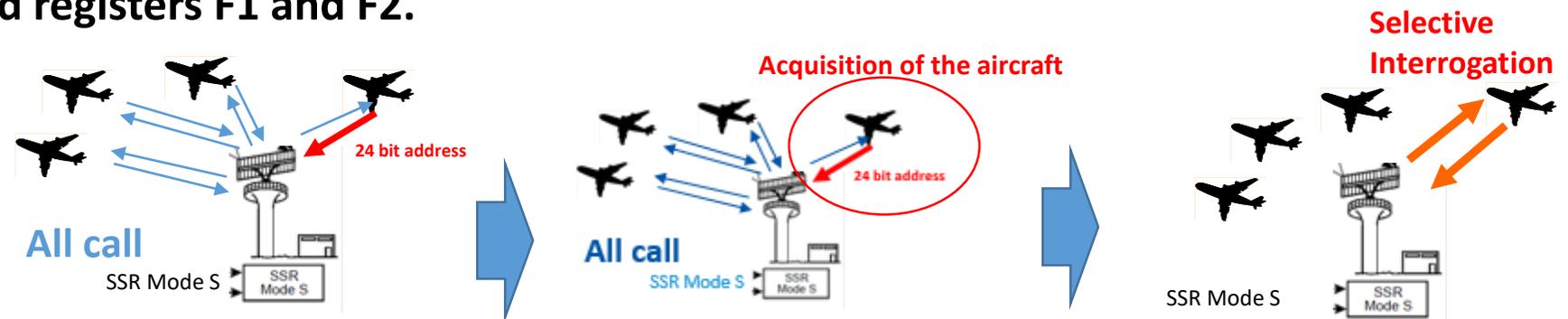
SP/4 OUTCOMES cont.
PfA :24-bit aircraft address

The PfA to A10V3 addresses safety issues raised by member States

Many concerns related to 24-bit aircraft addresses were raised by member States and aviation community in the past few years

1) duplicate aircraft addresses were provided to ATC systems in the same airspace,

2) shortage of some States' allocation blocks, and

3) increasing diversity of vehicles which request use of 24-bit aircraft addresses.

SP drafted a PfA to address these concerns, coordinated the PfA with the Communication Panel Data Communication Infrastructure Specific Working Group (CP-DCIWG), and reached agreement at SP/4

ANC Preliminary review will be held in Q4 2022, followed by State Consultation.

SP/4 OUTCOMES cont.

SP drafted PfA to Annex 10 Volume IV relating to

- updates to transponder requirements for compatibility with the new 1090 MHz extended squitter ADS-B version 3 format as detailed in RTCA/EUROCAE avionics standards;

- technical provisions for the efficient use of the 1090 MHz radio frequency (RF), providing means and measurements to reduce 1090 MHz RF congestion, ensuring better performance of surveillance systems and continued use of 1090 MHz systems;

- introduced ACAS III technical provisions, based on ACAS Xu (Unmanned Aircraft System) avionics standards developed by RTCA/EUROCAE; and

- a proposed revision to Chapter 7 of Annex 10 Volume IV, which specifies technical requirements for airborne surveillance applications utilizing ADS-B IN.

This draft PfA will be circulated for inter-panel coordination and it will be processed for SP/5 approval in October 2023. -- After that, it will be provided to the ANC for their preliminary review..

So, Changes Are Coming

- Evolution of ADS-B and Mode S

  New ADS-B Out version (version 3) and associated Mode S transponder changes
  GANP ASBU Element ASUR-B2/1

  https://www4.icao.int/ganpportal/ASBU/Element/Pdf?IDs=149&ShowPart1=true&ShowPart2=true&ShowPart3=true&ShowPart4=true

- New collision avoidance system **(ACAS X family)**
  GANP ASBU Element ACAS-B2/1

  https://www4.icao.int/ganpportal/ASBU/Element/Pdf?IDs=153&ShowPart1=true&ShowPart2=true&ShowPart3=true&ShowPart4=true

- Interval Management (IM) Procedure

  New ADS-B In capabilities (Airborne Surveillance Applications)
  GANP ASBU Element CSEP-B2/1

  https://www4.icao.int/ganpportal/ASBU/Element/Pdf?IDs=82&ShowPart1=true&ShowPart2=true&ShowPart3=true&ShowPart4=true

Goals for ADS-B V3 & Mode S transponder

❏Support new applications or new entrants

- ADS-B IN Interval Management

- **Commercial Space** and **RPAS operations** (**Lost C2 link**)

- **Provide aircraft-reported weather** information

❏Improve/support 1030/1090 MHz spectrum management

This is related to several other fields such as RPAS, MET, spectrum management and ITU WRC-23!

SP Ongoing Activities

In addition to the items listed in the previous slides, there are several ongoing activities! This includes:

- Development of technical performance specifications for surveillance systems
  - SP is developing a new manual or technical specification, which will replace Cir 326

- Investigation of new surveillance technologies for air traffic management use

- Information updates related to surveillance systems, included in the Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual.

FREQUENCY SPECTRUM MANAGEMENT
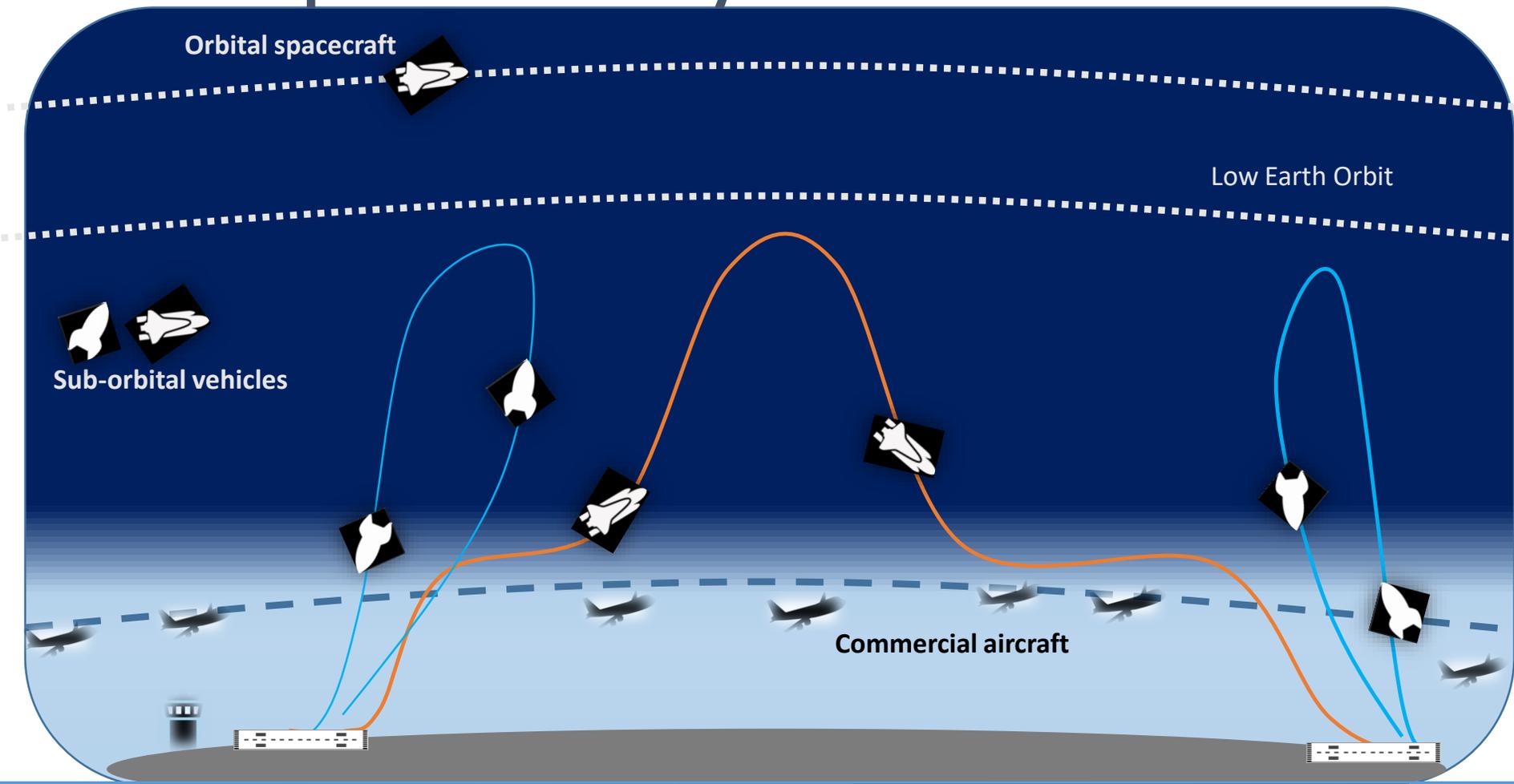
FREQUENCY SPECTRUM MANAGEMENT

- **ICAO Position for the International Telecommunication Union (ITU) World Radiocommunication Conference 2023 (WRC-23)**

  ➢ The ICAO Position was approved by the ICAO Council and sent to all ICAO Contracting States and relevant international organizations under cover of ICAO State letter E 3/5-21/37 dated 18 August 2021.

  ➢ It looks like the WRC-23, a year and a half from now, will be busier than ever for aviation. WRC-23 Agenda Items 1.6, 1.7, 1.8, 1.9, 1.10 and 9.2 address issues where aviation is seeking action by the WRC.
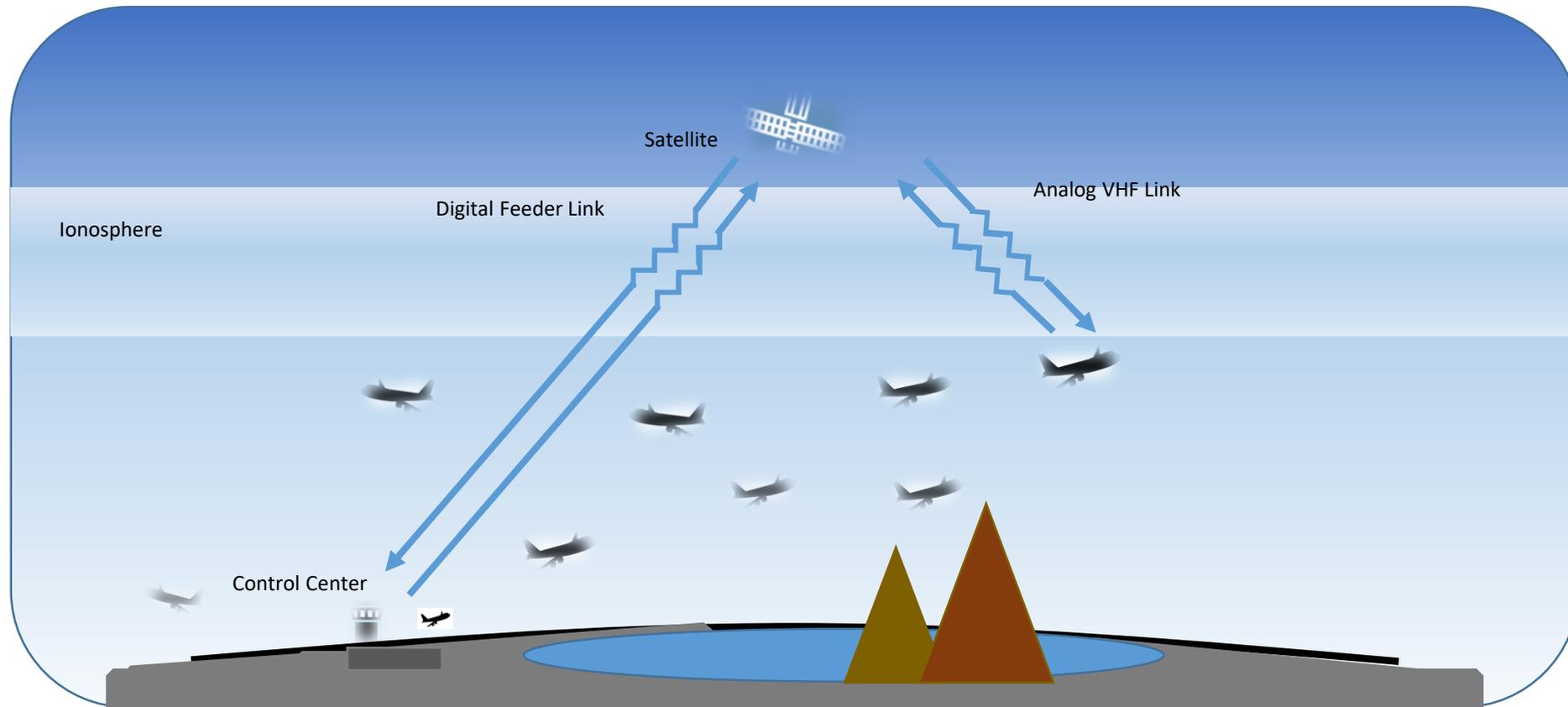

Tel.: +1 514-954-8219 ext. 7130

Ref.: E 3/5-21/37   18 August 2021

Subject: ICAO Position for the International Telecommunication Union (ITU) World Radiocommunication Conference (2023) (WRC-23)

Action required: To consider the ICAO Position when developing your State's position for WRC-23 and to support the ICAO Position during WRC-23

Some WRC-23 Agendas are related to Surveillance!

# WRC-23 Agenda Item 1.6:
Spectrum use by sub-orbital vehicles

WRC-23

Orbital spacecraft

Low Earth Orbit

Sub-orbital vehicles

Commercial aircraft

Free images of spacecraft from Pixabay

WRC-23 Agenda Item 1.7:
Potential facilitation of aeronautical VHF over satellite

Satellite

Analog VHF Link

Digital Feeder Link

Ionosphere

Control Center

Original image from ICAO CP-DCIWG

WRC-23 Agenda Item 1.8:
Finalization of a satellite allocation enabling beyond-line-of-sight C2-link for RPAS
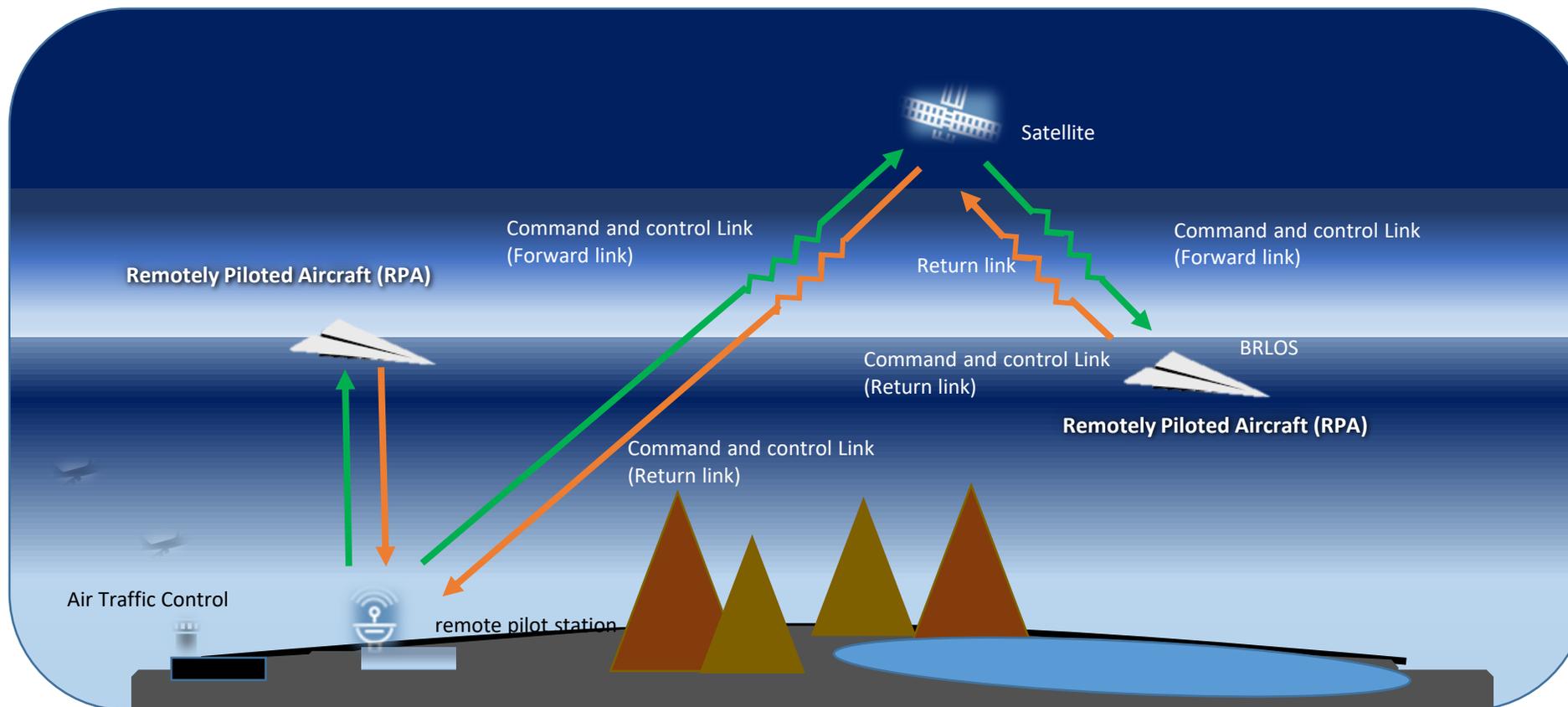
FREQUENCY SPECTRUM MANAGEMENT

- **ICAO Position for the International Telecommunication Union (ITU) World Radiocommunication Conference 2023 (WRC-23)**

  - ➢ **Active support from States is deemed to be the only means to ensure that the results of the WRC-23 reflect civil aviation's need for spectrum.**

  - ➢ Frequency Spectrum Management Panel (FSMP) is discussing some modifications to the ICAO position to align with the progresses made by relevant ITU Working Parties, which will be finalized by Q1 2023.

THANK YOU