



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

国際民間航空条約付属書と無線通信規則

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Presentation Overview

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01 国際民間航空機関(ICAO)

02 国際民間航空条約付属書 標準、勧告方式 (Standards and Recommended Practices(SARPs))

03 国際民間航空条約付属書と無線通信規則

04 周波数管理パネルの役割





国際民間航空機関(ICAO)

国際民間航空機関(ICAO)とは？

- 『国際民間航空条約(シカゴ条約)』に基づき、1947年に発足した国連専門機関。
- 設立目的
国際民間航空が安全にかつ整然と発達するように、また、国際航空運送業務が機会均等主義に基づいて健全かつ経済的に運営されるように各国の協力を図ること。
- 同目的のため、**国際航空運送の安全やテロ・環境対策等に関する政策や民間航空の国際ルール、国際標準、勧告方式等の策定、技術支援、事故の監視等を遂行。**
→ **標準、勧告方式はシカゴ条約の附属書(Annex)として発行される。**
(Standards and Recommended Practices =SARPs)



資料:ICAO日本政府代表部より

ICAOの組織

総会 Assembly

- 193カ国が参加する最高意思決定機関。
- 理事国選挙、予算の決定をはじめとする各種案件を決定。
- 3年に一度の定例開催…次回(第43回)は2028年秋。

理事会 Council

- 総会に対して責任を持つ常設の意思決定・執行機関として、総会の決定事項を実施。理事会議長・事務局長の任命、シカゴ条約附属書(Annex)の採択及び改正審議等を行う。
- イタリア出身のサルバトーレ・シャキターノ氏が理事会議長を務めていて、任期は2025年12月まで。
- 総会で選出された36カ国により構成。



資料:ICAO日本政府代表部より

ICAOの組織

委員会 Committees

- **航空委員会 Air Navigation Commission (ANC)**
 - ◆ シカゴ条約第9章・第10章に基づき設置された、国際標準等の作成の中核を担う技術面での理事会の補助機関。
 - ◆ 日本を含む19カ国からの19名の専門家で構成。
- **航空運送委員会 Air Transport Committee**
 - ◆ シカゴ条約第9章に基づき設置された、国際航空運送の経済関係を所管する委員会。
- **その他の委員会**
 - ◆ 総会や理事会での決定に基づき設置。



資料:ICAO日本政府代表部より

航空委員会議場(ICAOホームページより)

ICAOの組織

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事務局 Secretariat

事務局長 Secretary General



Mr. Juan Carlos Salazar

<https://www.icao.int/secretariat/SecretaryGeneral>

本部 (モントリオール)

- 航空技術局
Air Navigation Bureau
- 航空運送局
Air Transport Bureau
- 法律・対外関係局
Legal Affairs and External Relations Bureau
- 技術協力局
Capacity Development and Implementation Bureau
- 総務局
Bureau of Administration and Services

地域事務所

- バンコク
- 北京支所
- パリ
- カイロ
- ダカール
- ナイロビ
- メキシコシティ
- リマ

2024年7月時点での職員総数は791名で、コロンビア出身のフアン・カルロス・サラサル氏が事務局長を務めている。

資料:ICAO日本政府代表部より

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国際民間航空条約付属書 標準、勧告方式

(Standards and Recommended Practices (SARPs))

国際民間航空条約付属書

- 標準、勧告方式(Standards and Recommended Practices (SARPs))は『国際民間航空条約(シカゴ条約)』の附属書(Annex)として発行
- ICAOでは12,000以上のSARPsが含まれる19の付属書と6つのProcedures for Air Navigation (PANS)を管理している。



ICAOと私たちとの関わりの主な例

※「附属書」はシカゴ条約の一部

ICAOは国際民間航空の安全・保安・環境対策等の政策・規範作りや監視を行う国際機関

空港でのチェックイン



- パスポート作成の仕様に関する規則
- 航空会社による旅客情報取得義務づけ(いずれも第9附属書)

保安検査



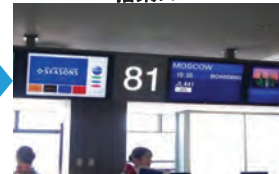
- 旅客や手荷物の保安検査の仕様や規則(第17附属書)

出国審査



- 円滑な出入国管理に関わる手順や規則
- 国際空港の旅客向け施設やサービスに関わるガイドライン
- 旅客や手荷物、貨物の出発・到着に関するガイドライン(いずれも第9附属書)

搭乗口



目的地到着



- 旅客が入国を拒否された場合の取扱ガイドライン(第9附属書)

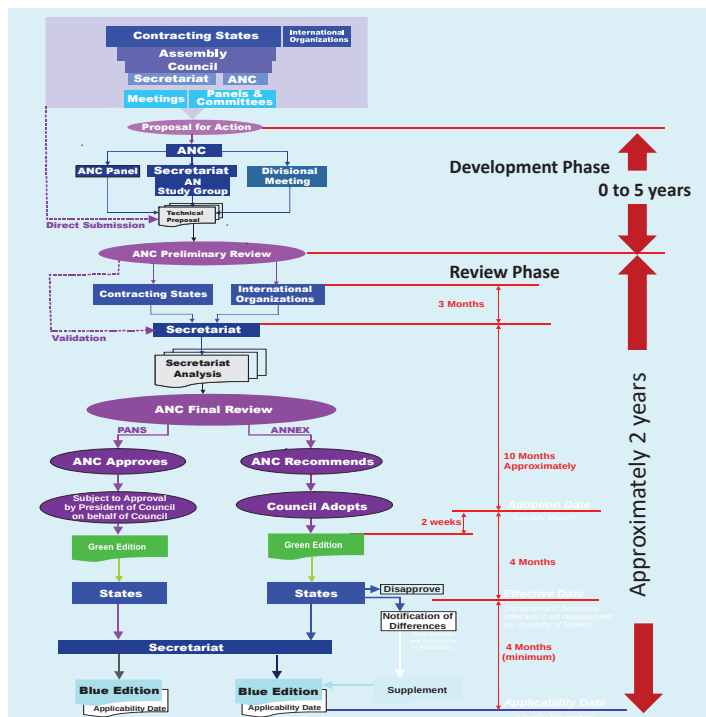
出発



- 国際線を運航する航空会社の事業に関する規則(第6附属書)
- パイロットの資格に関する規則(第1附属書)
- 航空機の登録に関する規則(第7附属書)
- 環境保護に関するルール(第16附属書)

- 運航に必要な気象情報やルート、通信、管制等のルール(第2, 3, 4, 5, 10, 11, 15附属書)
- 国際空港の仕様に関するルール(第14附属書)

資料:ICAO日本政府代表部より



The entire process of making an ICAO Standard

Development Phase :
ANC技術パネルの活動が主となる。
(草案を作成、技術的な実現性を確認、専門家として合意するところまで草案を完成させる。パネル、Panelとして合意した草案がANCに提出される)

Development Phase

航空委員会（ANC）技術パネルの役割

- ❖ To ensure all new or improved SARPs and PANS will be effective and practical for end-users, the ANC works through established panels of experts in various disciplines who are assigned specific tasks from the overall work programme.
- ❖ Each ANC Panel is supported by the ICAO Secretariat with the appointment of a Secretary, while their respective Chairpersons are elected from amongst the Panel membership.
- ❖ The full list of current ANC Panels is included in <https://www.icao.int/anc-technical-panels>

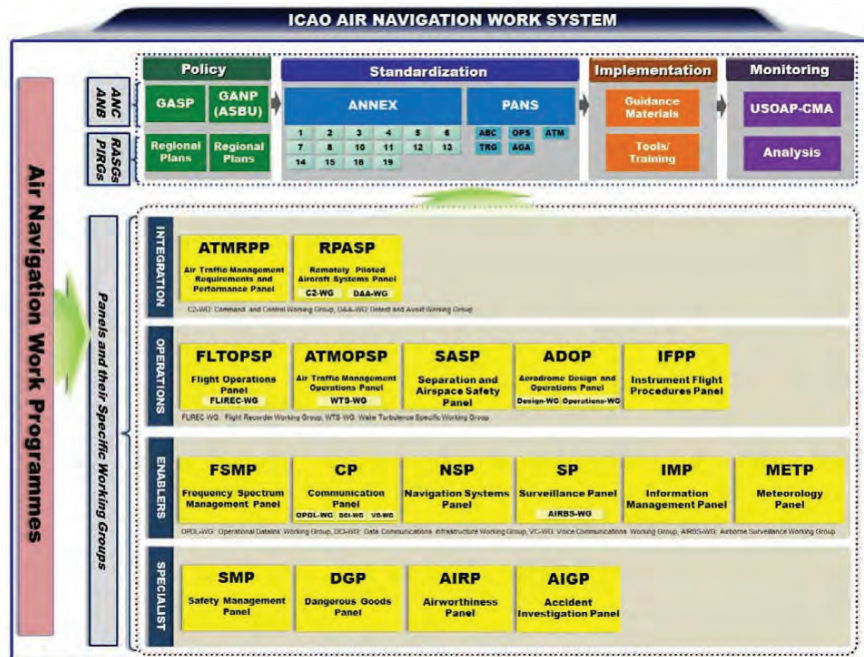
これらのパネルにはRadiocommunication and Radionavigation systemsと直接関連のある下記のパネルが含まれている。

- ☐ Communications Panel,
- ☐ Navigation Systems Panel
- ☒ Surveillance Panel, and
- ☒ Frequency Spectrum Management Panel

私が以前担当していた監視パネル

私が現在担当している
周波数管理パネル

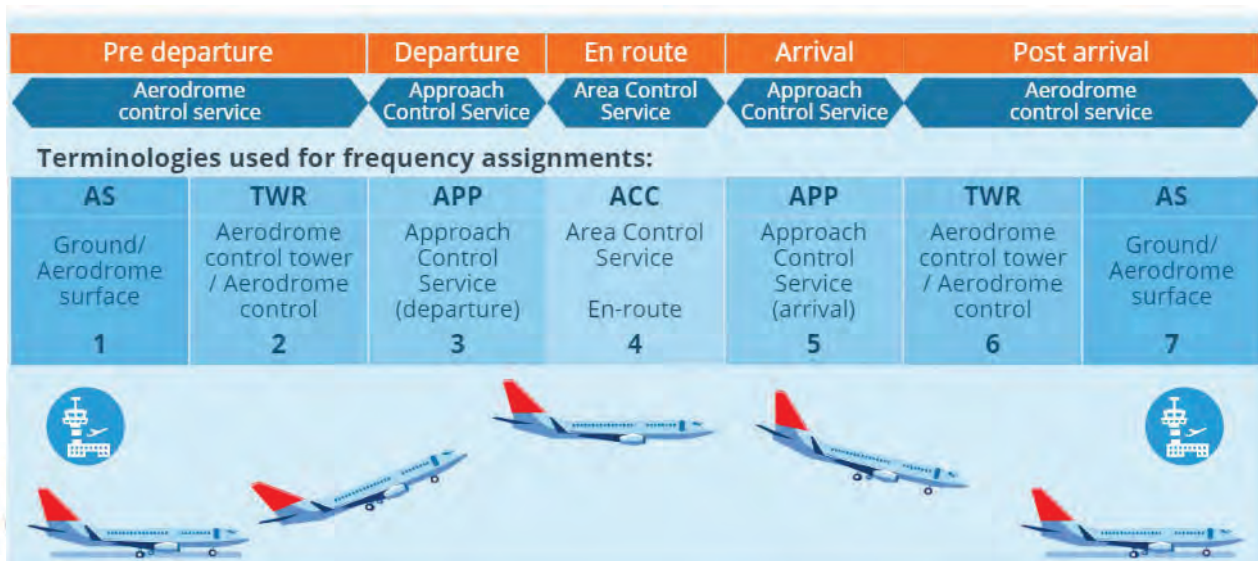




ANCパネル構成
(2015年時点)

https://www.icao.int/sites/default/files/left-menu-pdfs/ANC-200_final_web.pdf

通信 (Communications)



通信 (Communications)

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VHF Communication Perspective - Relay Race



Aircraft operation can be explained as the baton in a relay race

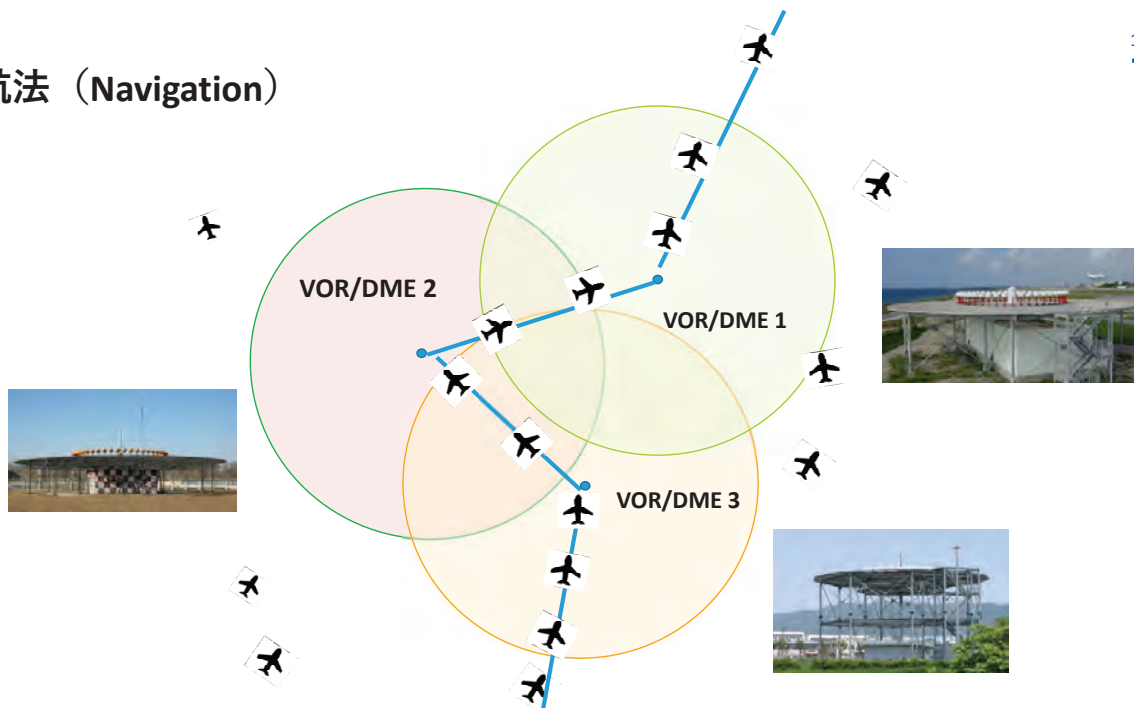
The baton is the Aircraft!

The control of the aircraft is passed from one ATC unit to the other through communications using different and assigned VHF frequencies.



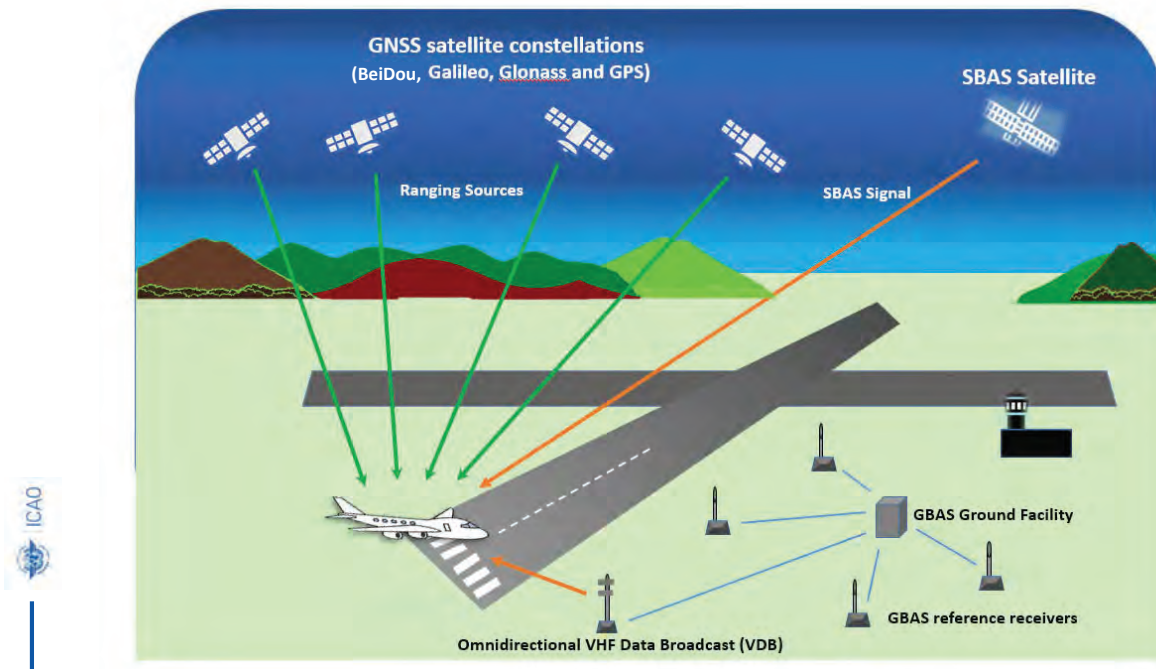
航法 (Navigation)

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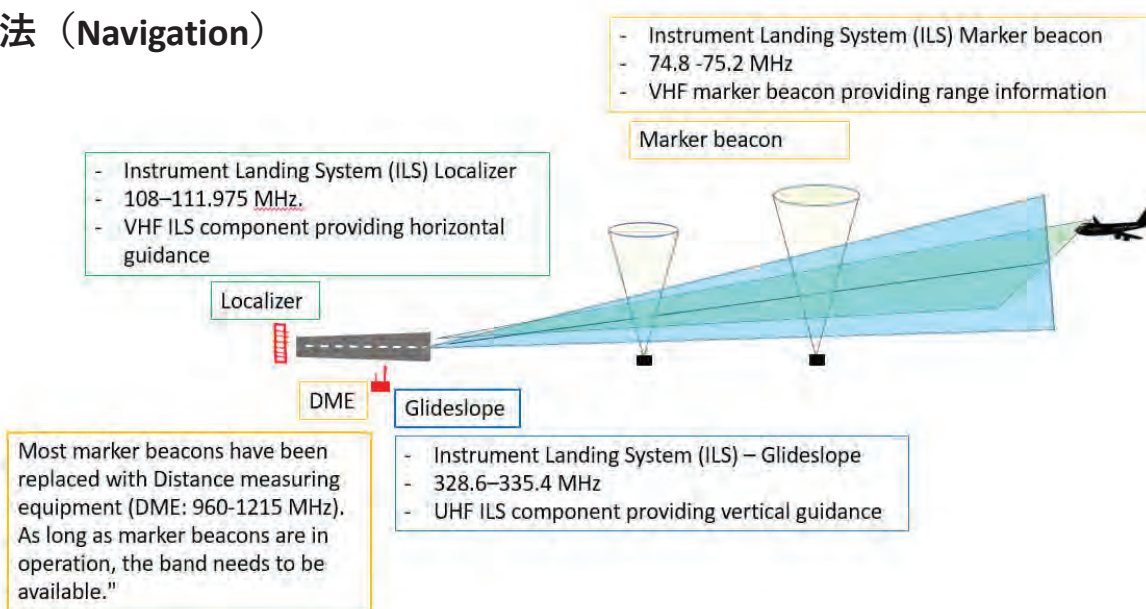


航法 (Navigation)

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航法 (Navigation)



Technical Panels

例えば 監視パネル (Surveillance Panel)

1) Develop and maintain SARPS and guidance materials covering the procedural and technical aspects of:

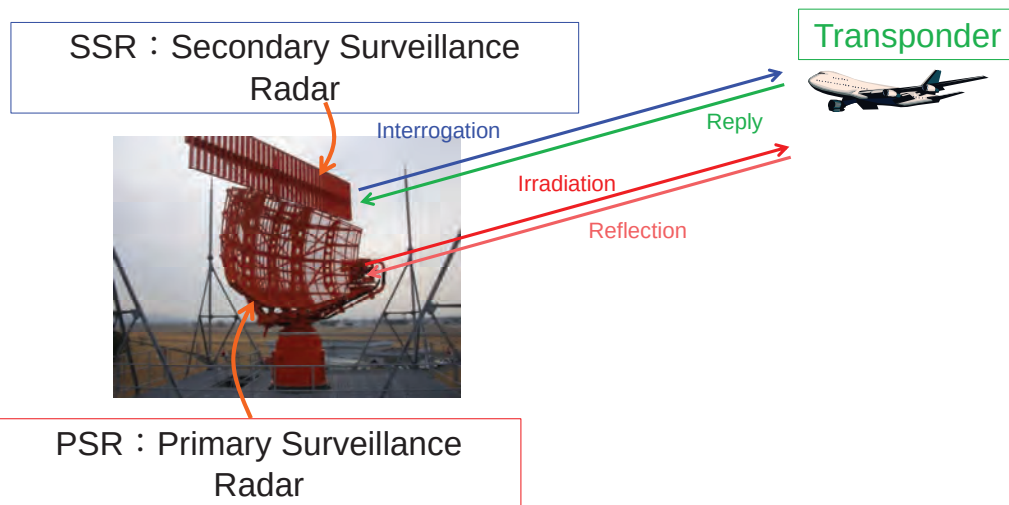
- a) airborne and ground based aeronautical surveillance systems
- b) airborne collision avoidance systems (ACAS)
- c) related facilities and systems
- d) airborne surveillance capabilities
- e) advanced airborne surveillance applications
- f) ground based safety nets

2) Develop provisions for detect and avoid capability for Remotely Piloted Aircraft (RPA) in coordination with the RPASP



監視 (Surveillance)

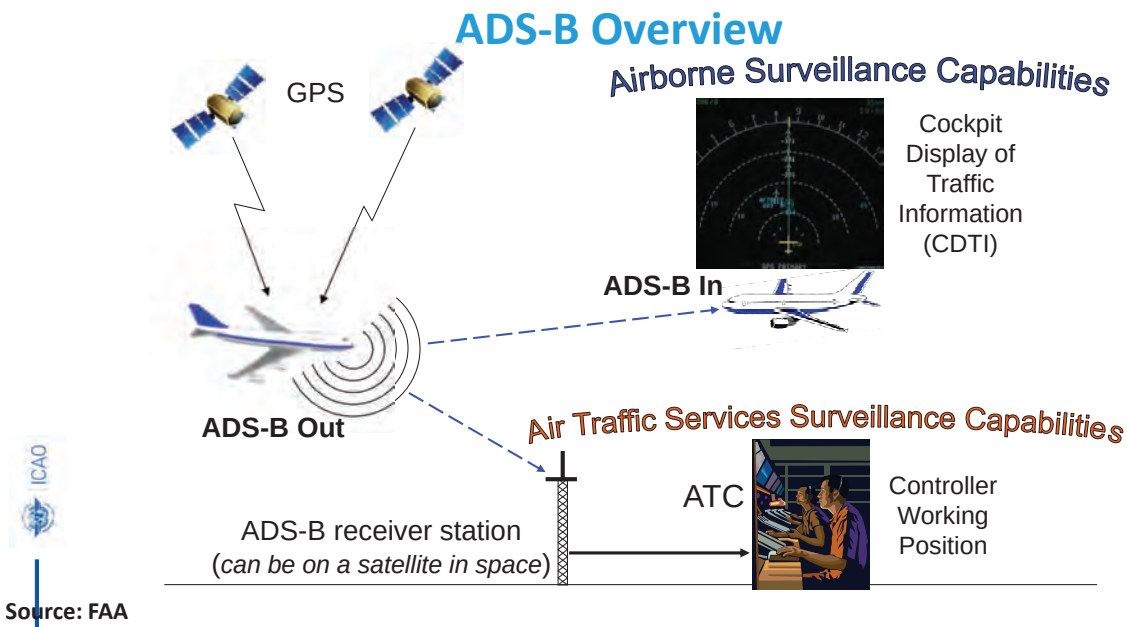
一次レーダー・二次レーダー Radar for Air Traffic Control (PSR and SSR)



Source:
Electronic Navigation Research Institute (ENRI)

監視 (Surveillance)

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監視 (Surveillance)

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Airborne Collision Avoidance System (ACAS)



Source: FAA



国際民間航空条約付属書と無線通信規則

RELATIONSHIP BETWEEN ITU RADIO REGULATIONS AND OTHER MATERIAL AND ICAO SARPs

The Radio Regulations

- ensures interference-free operations of radiocommunication systems and to provide ITU Member States with equitable access to the radio spectrum.
- supplement the ITU Constitution and Convention and form the core of the international framework for:
 - management of the radio frequency spectrum,
 - Protection of existing radio services, and
 - enabling the introduction of new and enhanced services

ICAO SARPs Annex 10

- ensure the safety and regularity of air navigation.
 - specify interface and performance standards for internationally agreed aeronautical systems.
 - contain procedures for regular and emergency communications that are specifically developed for aviation purposes, taking account of the operational conditions.
- *These procedures supplement the basic requirements of the Radio Regulations for procedures in aeronautical communications.*

The Radio Regulations and ICAO SARPs together form a complementary set of regulatory provisions without any overlap.

The Radio Regulations must evolve within the general telecommunications environment with its many and diverse users of the radio frequency spectrum, while the ICAO SARPs respond to the operational safety aspects of air navigation and are developed and agreed by aviation within the ICAO organizational framework.



FREQUENCY COORDINATION AND REGISTRATION

ITU framework

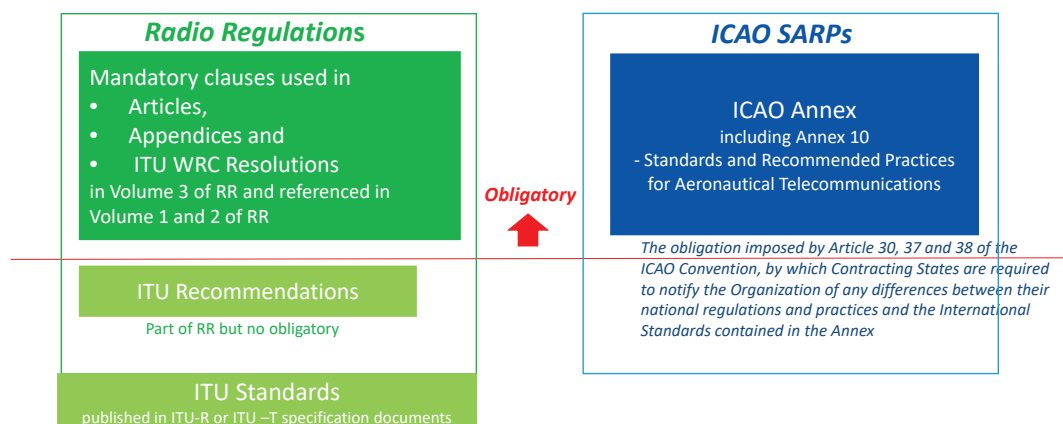
The coordination/registration of frequency assignments	- Is performed in accordance with procedures in the RR - Provide international protection of the assignment - Take place through the radio regulator authorities in each country
Frequency registration	in the Master International Frequency Register (MIFR)

In addition, specific procedures are placed for day to day coordination of the exclusive aeronautical bands.

The coordination of frequency assignments	- Is undertaken by ICAO through ICAO regional offices - To support this coordination, ICAO developed - frequency assignment planning criteria - A global frequency assignment plan - Take place in most cases with the national civil aviation authorities
Frequency registration	Many of aeronautical frequency assignment tend to be recorded only in national registers or in the ICAO regional air navigation plans.



STATUS OF ITU RADIO REGULATIONS/OTHER MATERIAL AND ICAO SARPS



Except for the very few instances where an ITU-R Recommendation is incorporated in the Radio Regulations, included in Volume 4 of the Radio Regulations and compliance is mandatory.





周波数管理パネルの役割



Objectives

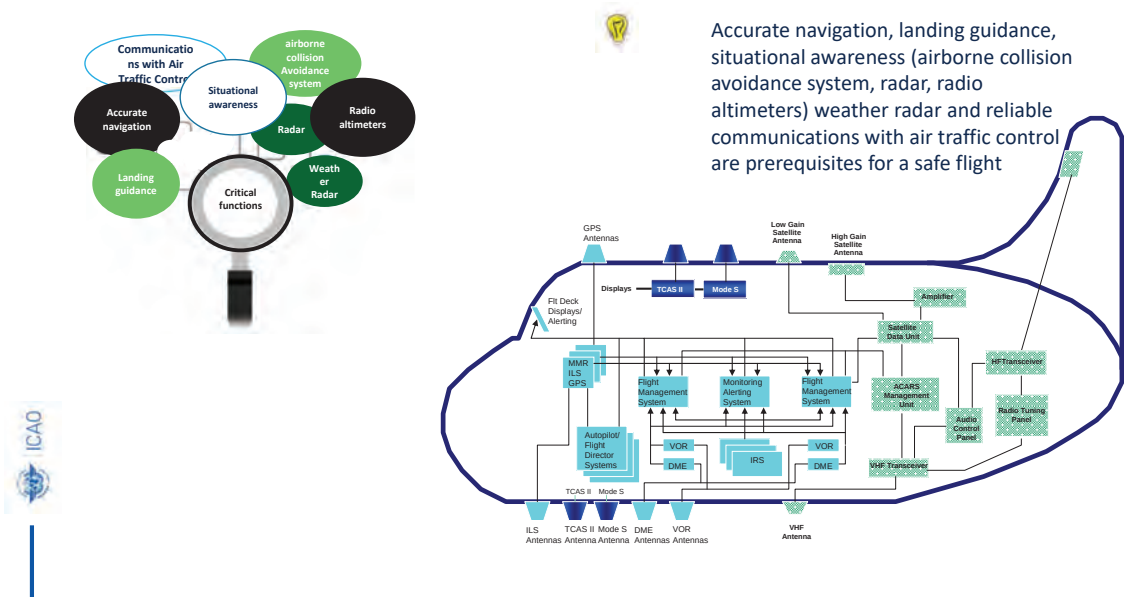
1. Develop and maintain SARPs and guidance material to facilitate frequency management of communication, navigation and surveillance systems.
2. Update proposals to the ICAO spectrum strategy, mapping out the future requirements for spectrum to support communication, navigation and surveillance systems, in close cooperation with the panels responsible for those systems.
3. Update proposals to the detailed ICAO Policy on all relevant aeronautical frequency spectrum allocations.
4. Develop the ICAO Position for upcoming ITU World Radiocommunication Conferences (WRC).
5. Assist the ICAO Secretariat in developing input material for studies within the ITU Radiocommunication Sector (ITU-R) as necessary to ensure that aeronautical interests are taken care of in the development of ITU-R Recommendations and Reports and in the development of draft solutions for an upcoming WRC.
6. Address issues of interference from aeronautical and non-aeronautical sources.

ICAO 周波数管理パネル (Frequency Spectrum Management Panel)

-> 電波高度計、Space-Based VHF等のSARPsの新規作成、
またAnnex 10 Volume Vの改定等を行っている

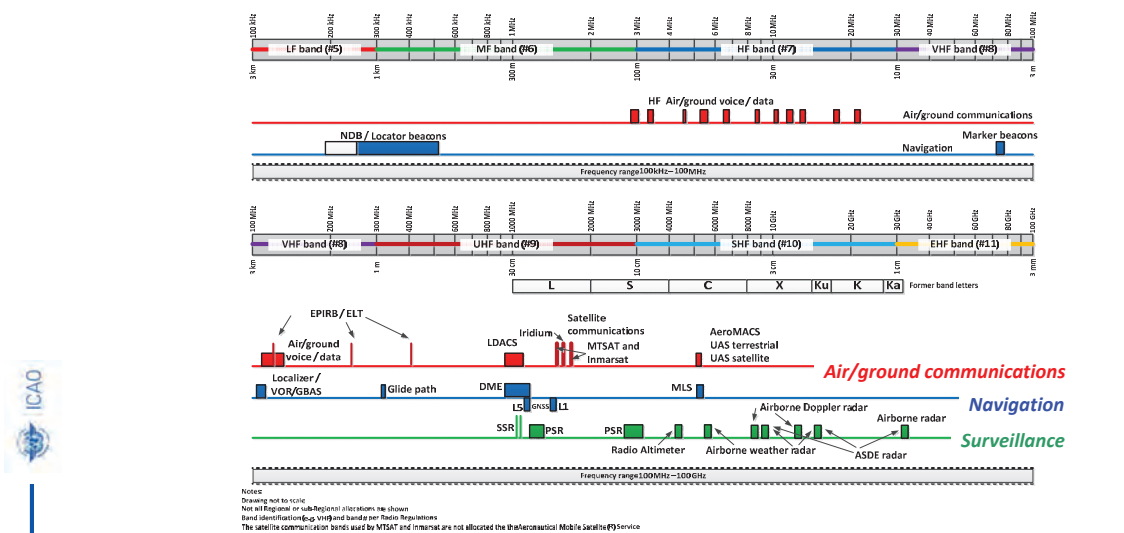
-> ICAO Spectrum Strategy、Policy、ICAOポジションの開発、改定、促進、ITU関連の会議での航空側の意見の統一、プロモーション等多岐にわたる活動を行っている

Aeronautical Frequency Spectrum Management



Aeronautical Frequency Spectrum Management

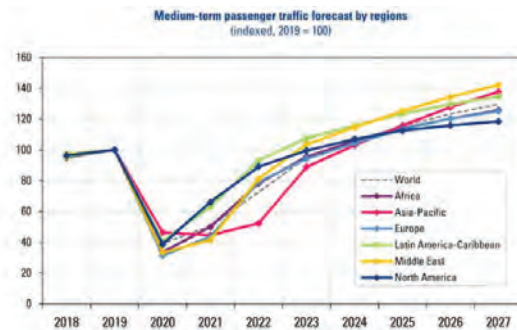
Over 1 GHz of frequency spectrum in global allocations to aeronautical safety services



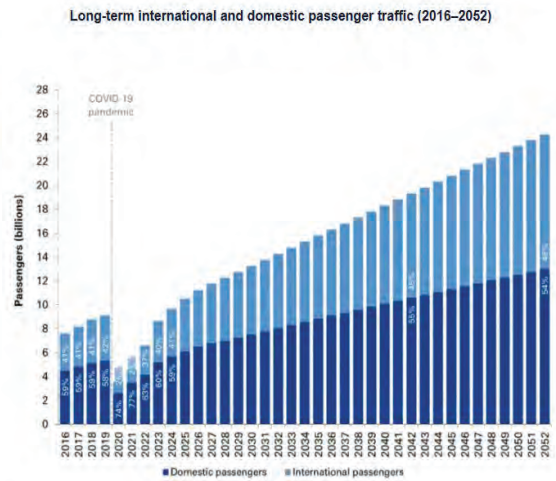
Aeronautical Frequency Spectrum Management

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World wide consistent growth of air traffic



Between 2023 and 2052, global passenger traffic is expected to reach close to 25 billion, approximately 2.5 times the 2024 projection



Source: ACI World Airport Traffic Forecasts (WATF) 2023-2052

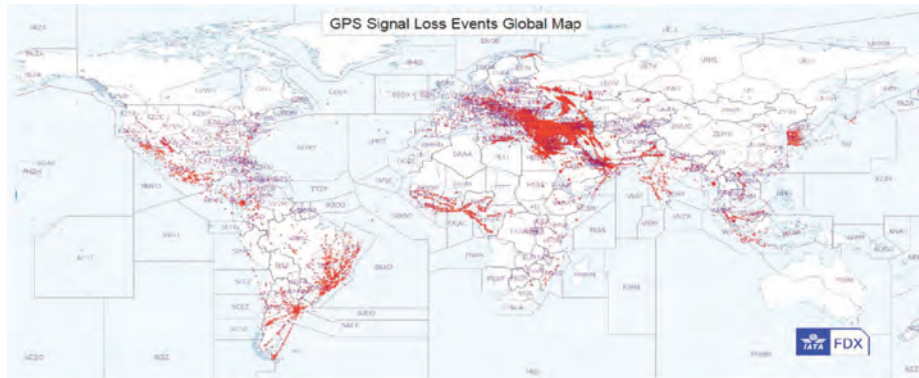


Global Navigation Satellite System Radio Frequency Interference (GNSS RFI)

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WRC-23 Agenda Item 9.2: Difficulties or inconsistencies encountered in the application of the Radio Regulations



GNSS RFI recorded events (August 2021-December 2022), source is IATA FDX program

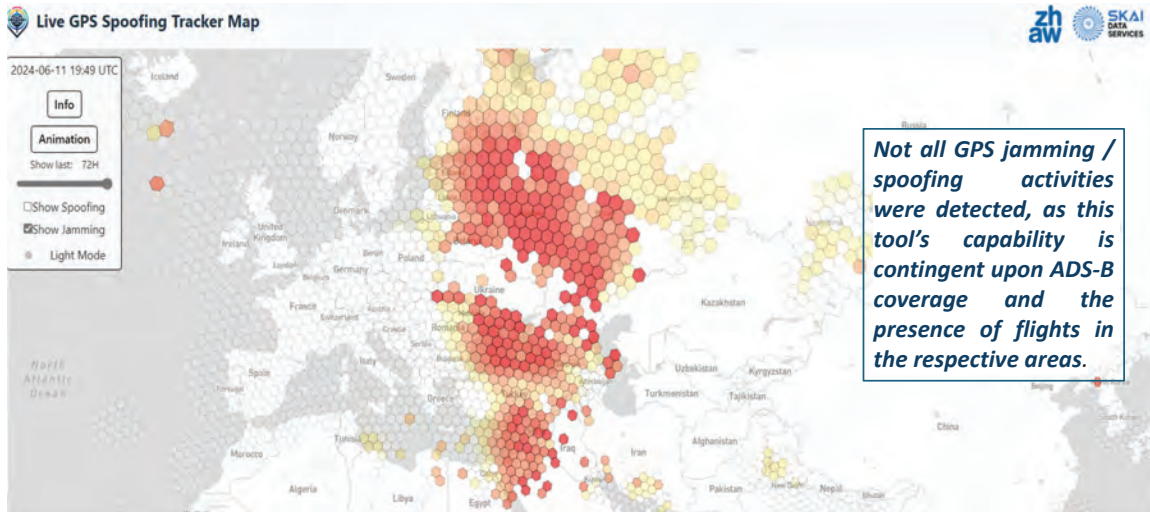
A new RNSS Resolution (Res 676) agreed, which urges administrations “to apply necessary measures to avoid the proliferation, circulation and operation of unauthorized transmitters that cause or have the potential to cause harmful interference to RNSS systems and networks operating in the frequency bands 1164 – 1215 MHz and 1559 – 1610 MHz...”, while also, recognizing the “right of administrations to deny access to RNSS, for security or defence purposes”



Definitions

- **GNSS**
 - A worldwide position and time determination system that includes one or more satellite constellations, aircraft receivers and system integrity monitoring, augmented as necessary to provide position, navigation, and timing (PNT) information supporting aircraft and air traffic management operations.
- **Jamming**
 - An intentional RFI with GNSS which prevents receivers from locking onto satellites signals and has the main effect of rendering the GNSS system ineffective or degraded for users in the jammed area.
- **Spoofing**
 - Broadcast of GNSS-like signals that cause avionics to calculate erroneous positions and provide false guidance.

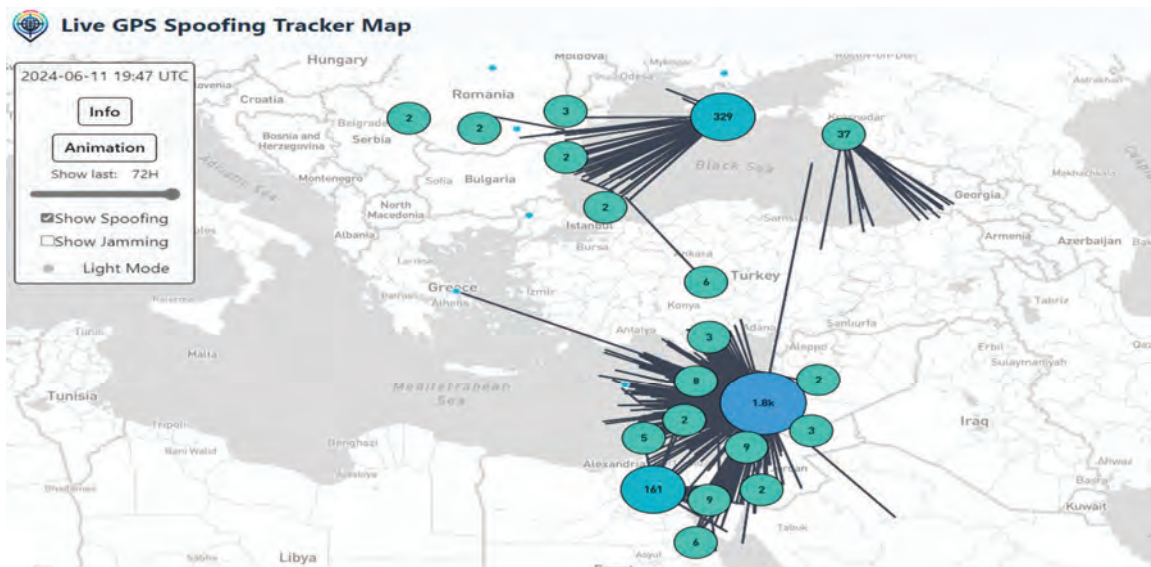




Areas of potential **GPS jamming** are indicated by colored hexagons.

The redder the hexagon, the more jamming was observed.

This tool utilizes live ADS-B data from the [OpenSky Network](#) to identify and display potentially spoofed aircraft in real-time.



The map displays clusters indicating areas with **detected spoofed aircraft** GPS positions.

The numbers within each cluster represent the number of flights spoofed at that specific location.

The lines indicate the positions of airplanes just before they were spoofed.

The ITU WRC-27 agendas



Main WRC-27 Agenda Items relevant to Aviation

1.7

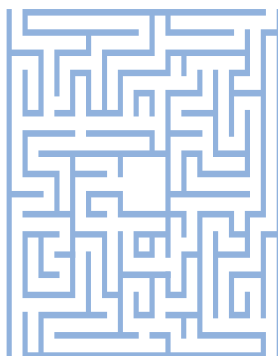
Use of IMT in the frequency bands 4400-4800 MHz

1.9

Update Appendix 26 – Aeronautical Mobile OR high-frequency modernization

1.17

Space weather sensors



1.19

Primary allocations to the EESS passive in the bands 4200-4400

9.1

Urgent action by Study groups in prep for the next WRC
- C2 LINK

And many others...
For example, 1.11, 1.12 and 1.13





ICAO

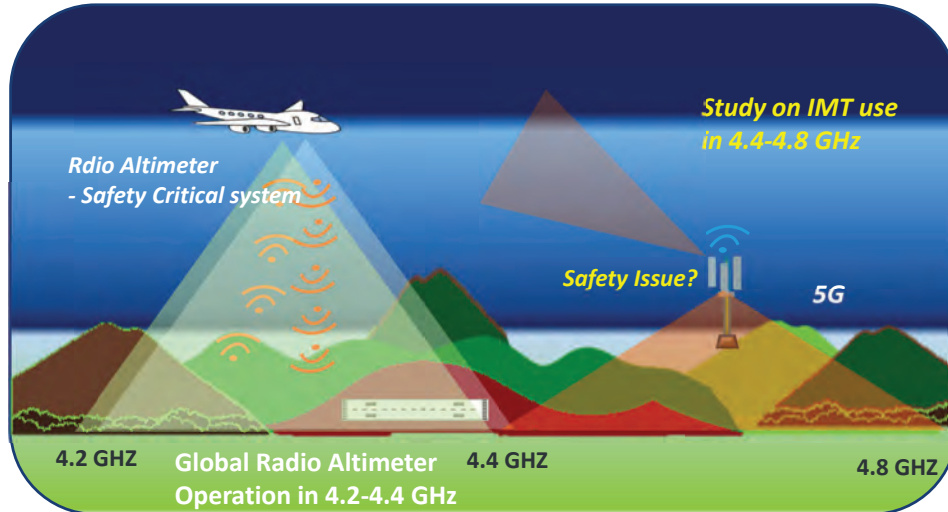
RECONNECTING THE WORLD



WRC-27

WRC-27 Agenda Item 1.7:

Study on IMT Use in the frequency bands 4400-4800 MHz



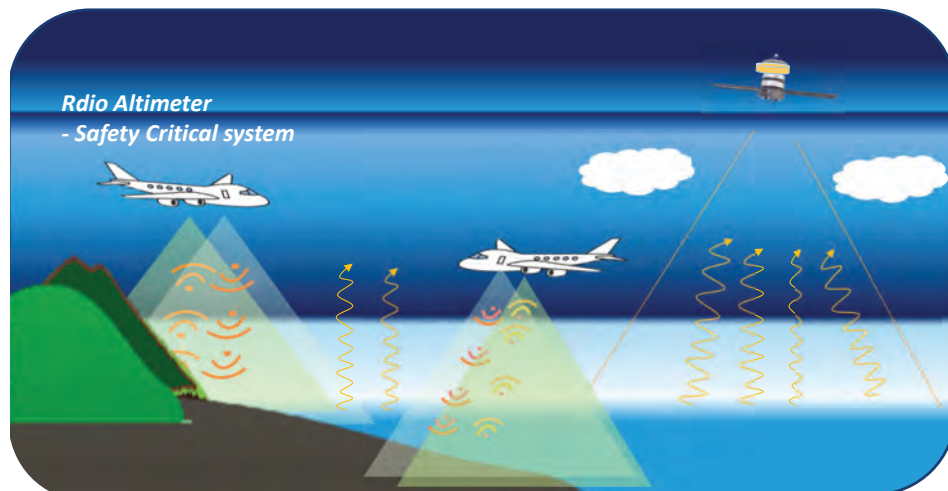
ICAO

RECONNECTING THE WORLD



WRC-27

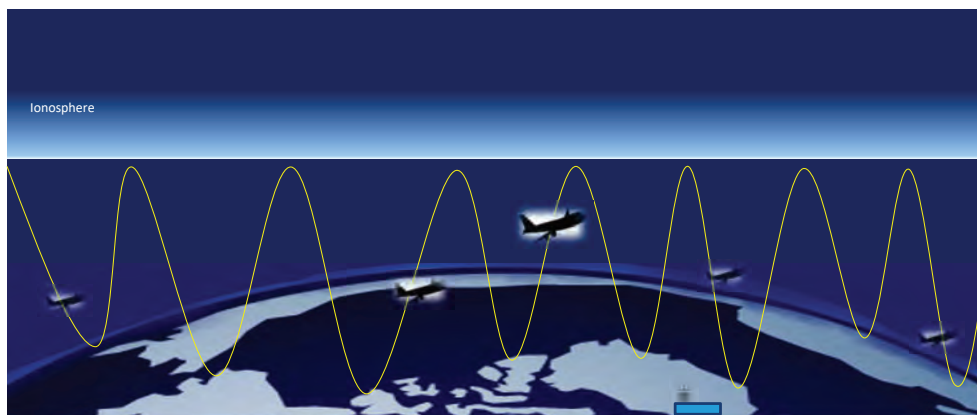
WRC-27 Agenda Item 1.19: Primary allocations to the EESS passive in the bands 4200-4400





WRC-27

WRC-27 Agenda Item 1.9: Update Appendix 26 in support of aeronautical mobile (OR) high frequency modernization



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WRC-27

WRC-27 Agenda Item 1.17: Space Weather Sensors





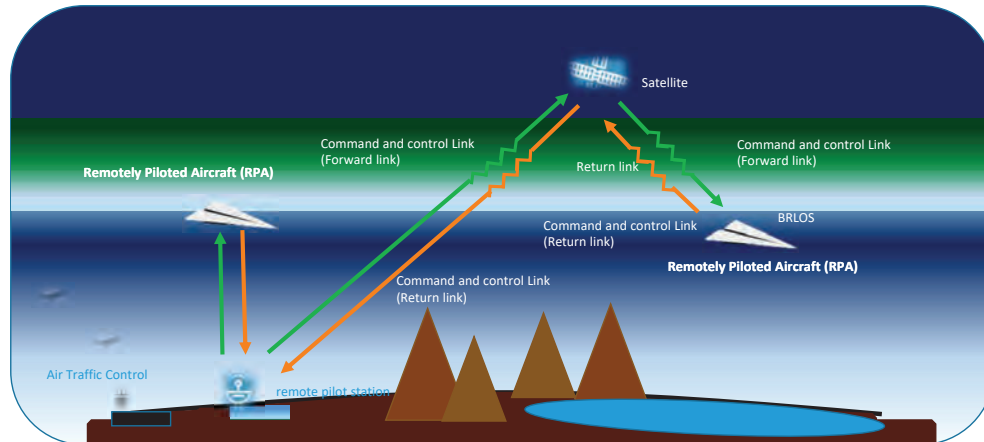
ICAO

RECONNECTING THE WORLD



WRC-27

WRC-27 Agenda Item 9.1: Urgent action by Study groups in prep for the next WRC beyond-line-of-sight C2-link for RPAS



ICAO

RECONNECTING THE WORLD



ICAO Position and WRC preparations

ITUWRC



ITU WRC Agenda established

ICAO position established
after WRC agenda established

FSMP is the focal point on
all aspects related to
development of ICAO's position



The Position presents ICAO
views on all WRC agenda items
of interest to international civil
aviation, with particular regard
to safety and regularity of flight



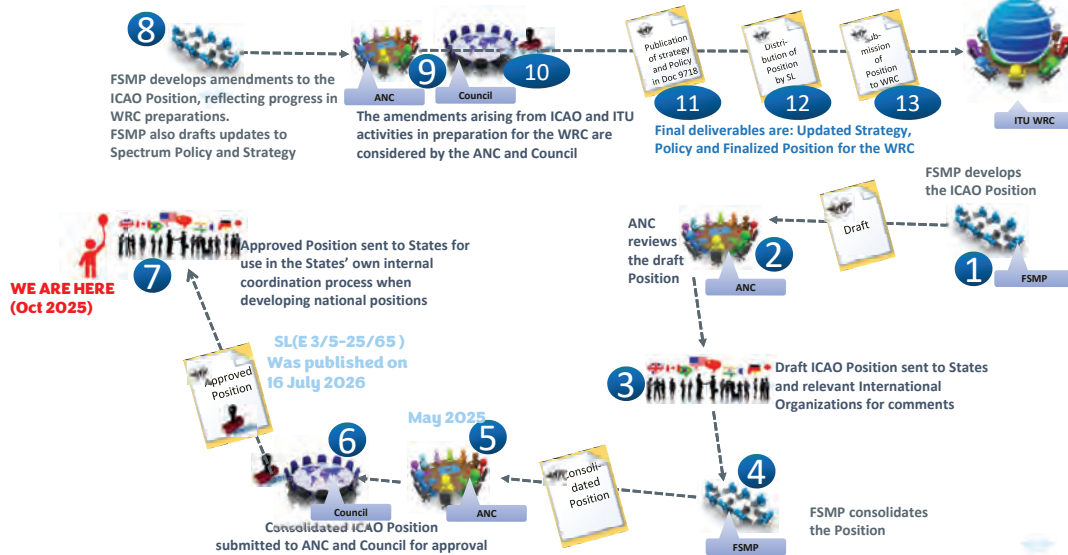


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ICAO Position and WRC preparations



ICAO

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ICAO Position for the International Telecommunication Union (ITU) World Radiocommunication Conference 2027 (WRC-27)

- The ICAO Council, at the ninth meeting of its 235th Session held on 25 June 2025, approved the ICAO Position for ITU WRC-27.
- The relevant State Letter was published on 16 July 2025.
- States and Int Orgs are requested to take into account the ICAO Position, to the maximum extent possible,
 - in their prep activities for the WRC-27 at the national level,
 - in the activities of the regional telecommunication organizations and
 - in the relevant meetings of the ITU.



State Letter 24/93 (ICAO-NET)

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