
IFATCA

# User Preferred Route (UPR) Operation

The experience and perspectives
from New Zealand's  and Indonesia's ATCOs

# What you will hear about at this presentation?

- **Pre-Implementation** – How were controllers informed, prepared, and involved before UPR/FRA began?
- **Trial Phase** – What did simulations and trials reveal about realism, gaps, and feedback?
- **Implementation** – How did daily operations, workload, and system support change after rollout?
- **Safety & Human Factors** – What were the impacts on safety, efficiency, workload, and team coordination?
- **Lessons & Recommendations** – What improvements, tools, training, and ATCO involvement are needed for the future?

# Presenters

**Indonesia –**

**Ms. Umi Muthiah Syahirah**

- ❑ Air Traffic Controller, AirNav Indonesia (10+ years experience)
- ❑ Experience in:
  - Aerodrome Control Tower
  - Approach Control (Procedural)
  - Area Control (Procedural & Surveillance)
- ❑ ACC ATC in Ujung FIR, Indonesia
- ❑ International Public Relation, Indonesia Air Traffic Controller Association
- ❑ Communication Coordinator, IFATCA Asia Pacific Region

**New Zealand –**

**Ms. Marnie Pomeroy**

- ❑ Air Traffic Controller, Airways New Zealand, 22 years first rated in 1991.
- ❑ Ratings:
  - Aerodrome Control
  - Procedural Approach Control
  - Area Surveillance Control
  - Area Procedural Control
- ❑ Current position: Deputy Team Leader, Standards & Procedures Auckland Oceanic, **Airways New Zealand**
- ❑ Technical Lead, ATC Council of New Zealand Airline Pilots Association **NZALPA**

# The New Work In Progress from Indonesia

# Pre-Implementation

How were controllers informed, prepared, and involved before UPR/FRA began?

- **June 2020**: UPR trial procedures were officially drafted and released for use within Indonesian airspace (Jakarta & Ujung Pandang FIRs)

- **8 June 2020**: Simulations and controlled trials began, allowing controllers to familiarize themselves with the UPR concept and practice dynamic routing operations

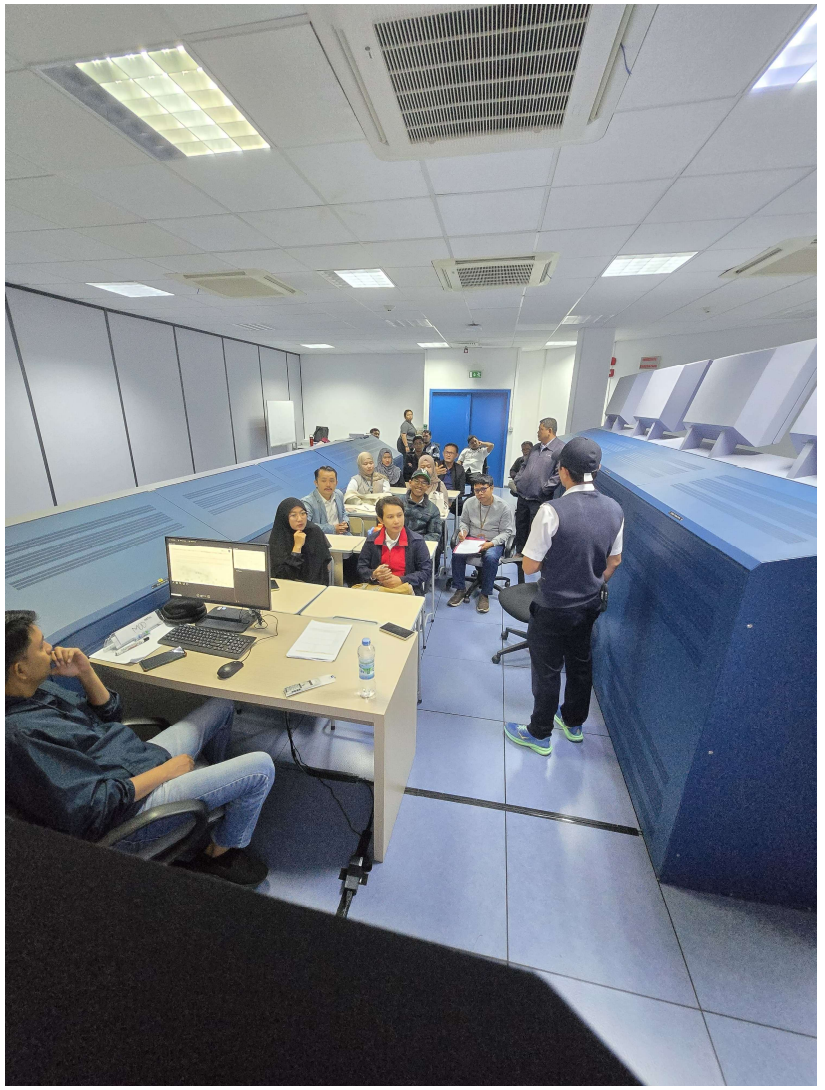
# Trial Phase –

What did simulations and trials reveal about realism, gaps, and feedback?

- **5 October 2023**: UPRs became officially operational within domestic airspace across Jakarta FIR and Ujung Pandang FIR, marking the start of routine flexible routing in daily operations

- **5 August 2024**: Cross-FIR Boundary UPR trials commenced, enabling dynamic routing between Indonesia and Australia in collaboration with other regional ANSPs and airlines

# Classroom prior to simulation



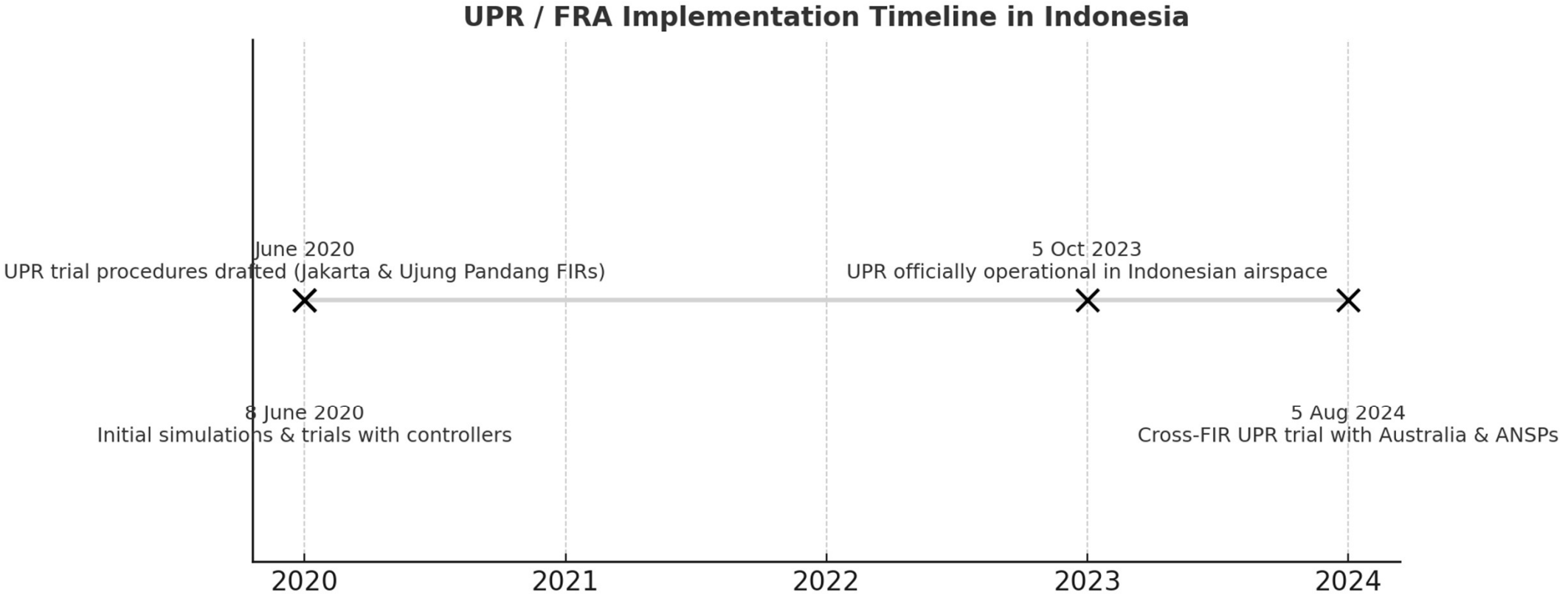
# ujUNG ATC SIMULATOR

# Implementation

How did daily operations, workload, and system support change after rollout?

- From **October 2023 onward**, AirNav Indonesia fully integrated UPRs into daily operations, with updated flight data processing and surveillance tools supporting controllers' workflows.

- With **August 2024 Cross-FIR trials**, inter-FIR coordination intensified alongside adjustments in workload distribution and communication protocols between adjacent domains


UPR / FRA Implementation Timeline in Indonesia
June 2020
UPR trial procedures drafted (Jakarta & Ujung Pandang FIRs)
8 June 2020
Initial simulations & trials with controllers
5 Oct 2023
UPR officially operational in Indonesian airspace
5 Aug 2024
Cross-FIR UPR trial with Australia & ANSPs
2020
2021
2022
2023
2024

# Flight Plan Conflict Function (FPCF) & Warning (FPCW)

- Implemented in ATS System at Ujung Pandang ACC (2025)
- Activated from **23rd January, 2025 00.00 UTC.**
- Supports User Preferred Route (UPR) operations in Jakarta FIR & Ujung Pandang FIR
- Objective: Enhance safety by automatic conflict detection Integrated into daily ATC operations

# What is FPCF?

- FPCF = Flight Plan Conflict Function

A function in ATS System to detect potential traffic conflicts up to 60 minutes ahead

- Separation parameters:
  - 5 NM for Surveillance
  - 50 NM for Procedural
- Generates Flight Plan Conflict Warning (FPCW) 5 minutes before conflict (300 seconds)

# What is FPCW?

- FPCW = Flight Plan Conflict Warning

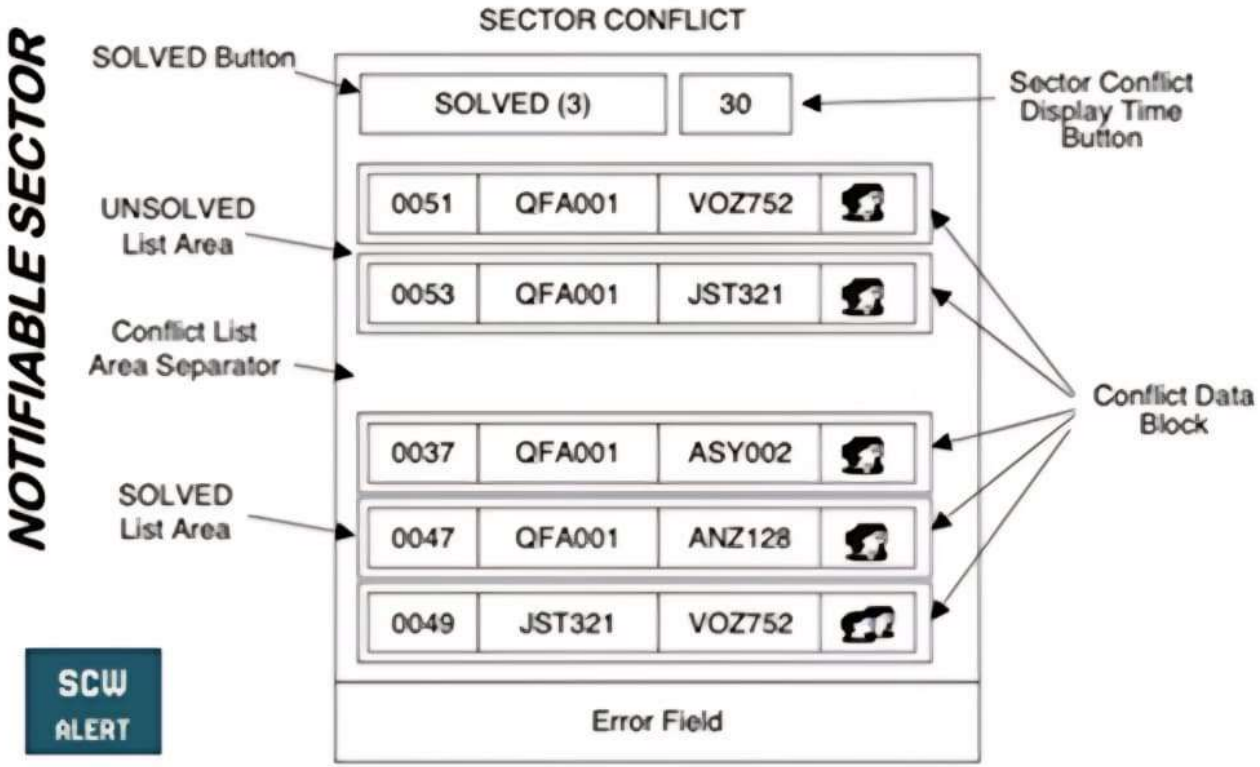
Appears as a Critical Warning on Track Label when conflict is predicted

- Provides early alert before Conflict Start Time (CST)
- Ensures controller can take preventive action to maintain safe separation

# How It Works

- Detection Tools:
  - Sector Conflict Window (SCW): shows sector traffic conflicts
  - CST/CET: indicates conflict timeline
  - Graphic Route Display: visualizes route of conflict
  - Solved/Unsolved Status: manage conflicts
  - Probe/Trial: simulate level change or reroute

- Controller Duties when FPCW appears:
  1. Verify message
  2. Acknowledge / “ACK”
  3. Apply separation
  4. Change conflict status → Solved

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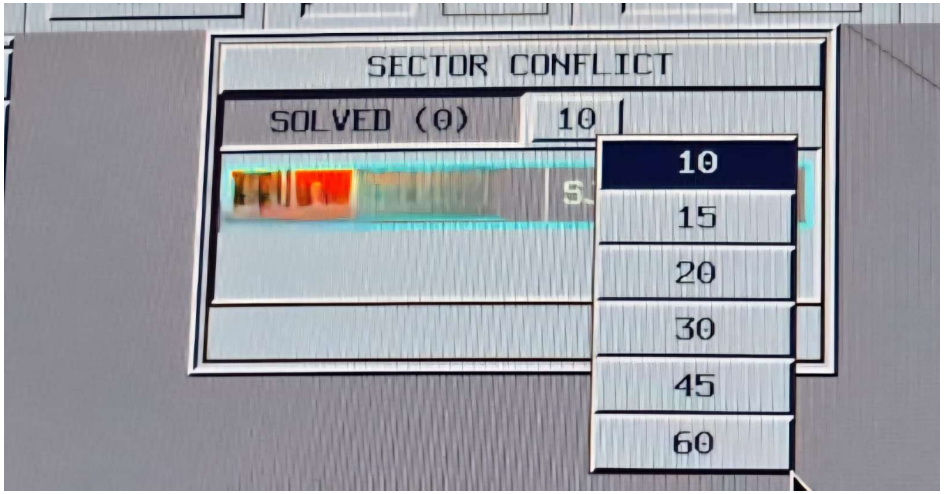
[Sector Conflict Window] →[CST button] → {CenterClick} → (Unsolved to Solved vv)

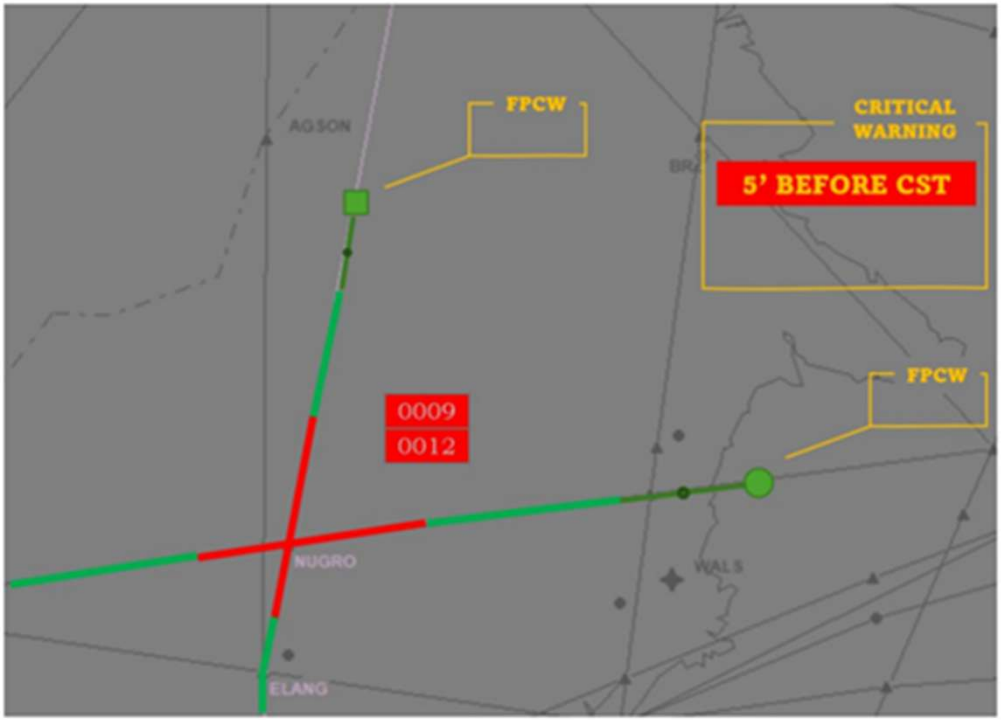
# Sector conflict display time

- Window setting allowed to be adjusted based the ATC needed from 10,15,20,30,45, to 60 minutes



# Graphic route

- It displays the **route where the conflict will occur** when the controller clicks the CST button
- Helps visualize which flight paths are conflicting.
- Can be **turned ON/OFF** using the CST button.
- If turned OFF, the graphic disappears (clean display).
- It's a **support tool** so controllers can quickly **see the trajectory and anticipate separation action**.



# Benefits for ATC

- Enhances safety: detects conflicts earlier
- Improves efficiency: reduces workload with automation
- Supports UPR operations: safer integration of flexible routes
- Decision-making aid: Probe/Trial helps resolution
- Standardized conflict management across sectors

# The New Application of Old Tricks from New Zealand

# Pre-Implementation

How were controllers informed, prepared, and involved before UPR/FRA began?

- With the implementation of the Oceanic Control System(OCS) in 2001, system capability permitted UPR from onset.

- Prior to this TDM ‘Flexi Tracks/routes’ were produced daily by Oakland between city pairs in the South Pacific.

# Functionality

Conflict detection and resolution

- At the heart of the Oceanic Control System (OCS) is the CPAR function- Conflict Probe and Reporting.  This function enables a type of long range conflict alert.
- OCS relies on an aircraft profile based flight plan information, route, speed and altitude and is updated through position reporting and weather updates.
- The profile is surrounded by a cube of protected airspace and the CPAR function will advise the controller of conflicts.
- CPAR is dynamically active as well as instigated by the controller when analysing a new proposed route.

# Oceanic Control System Background

- OCS is considered to be a controlling tool and is designed to assist Controllers in the provision of separation by way of a software algorithm known as the Conflict Probe

- The Conflict Probe calculates the positions of all known aircraft relative to each other and determines if their Profiles are appropriately separated

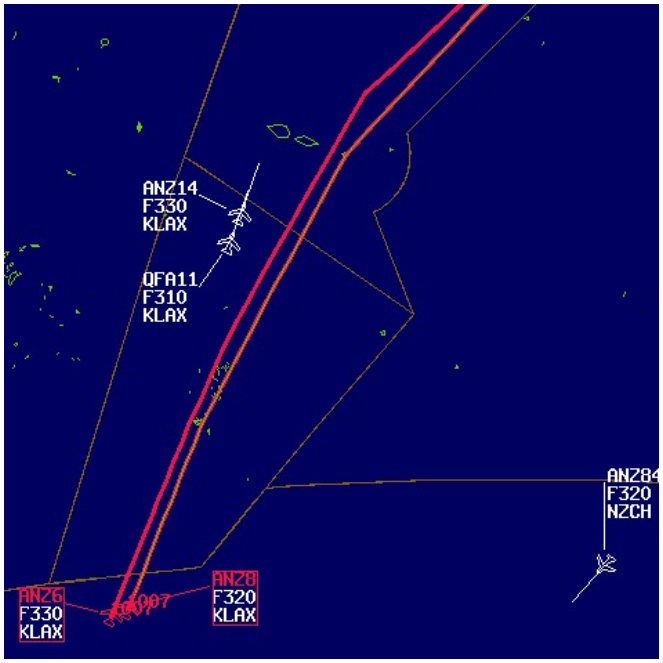
- Aircraft Profiles that are not separated by the required minima are deemed to be In Conflict - which is presented visually to the Controller for analysis and resolution

CONFLICT SUMMARY

Override Help

| Intruder | Att | Active | Att | Ovrd | Type | StartTime | EndTime |
|---|---|---|---|---|---|---|---|
| *ANZ8 | C | ANZ6 | - | | >>X | 1007 | 1417 |

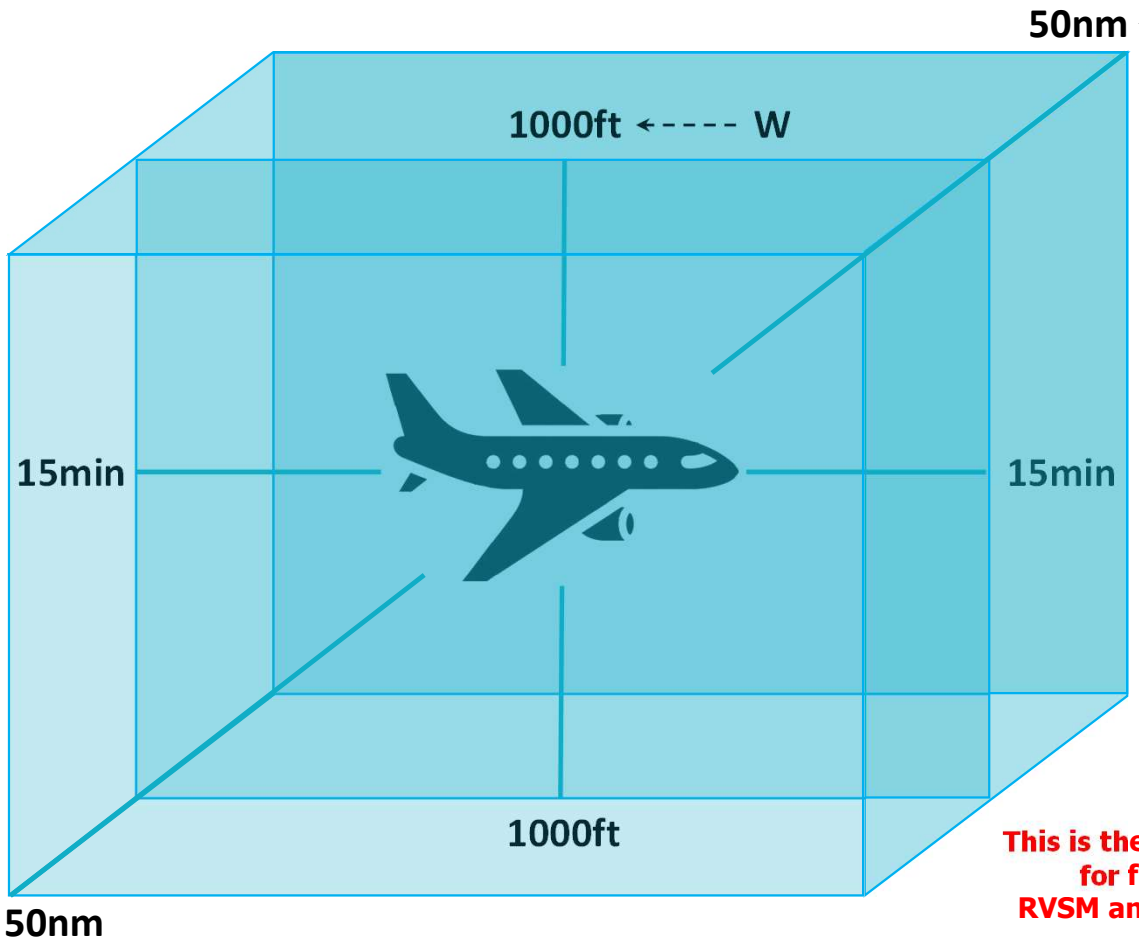




# CS Aircraft Profile Generation

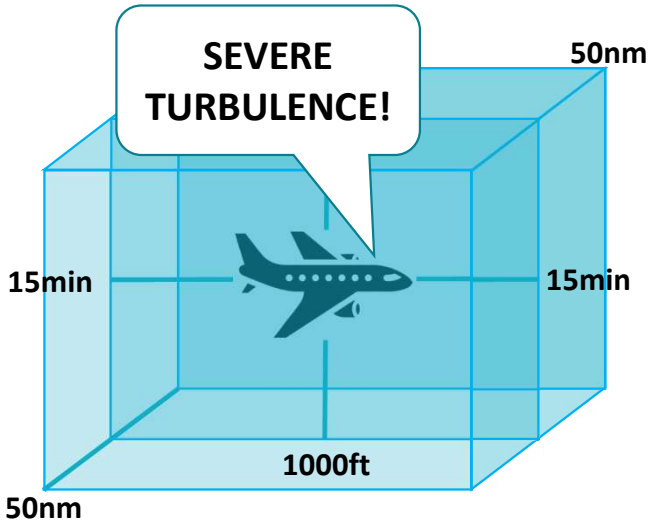
- Aircraft Profiles are generated and maintained by using the following components extracted from Field 10 of the filed flight plan:
  - Route
  - Altitude/Flight Level
  - Planned or reported Speed/Mach Number
  - Time (Estimated elapsed times/OCS calculated/Pilot reported)

# Oceanic Separations




**This is the default separation for flights that are RVSM and RNP10 or better**

# creased Oceanic Separations



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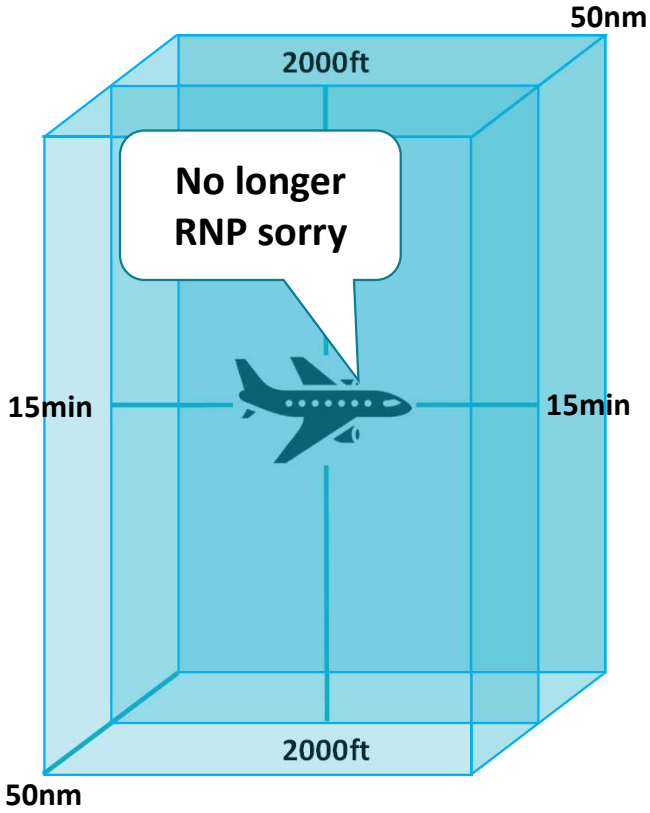

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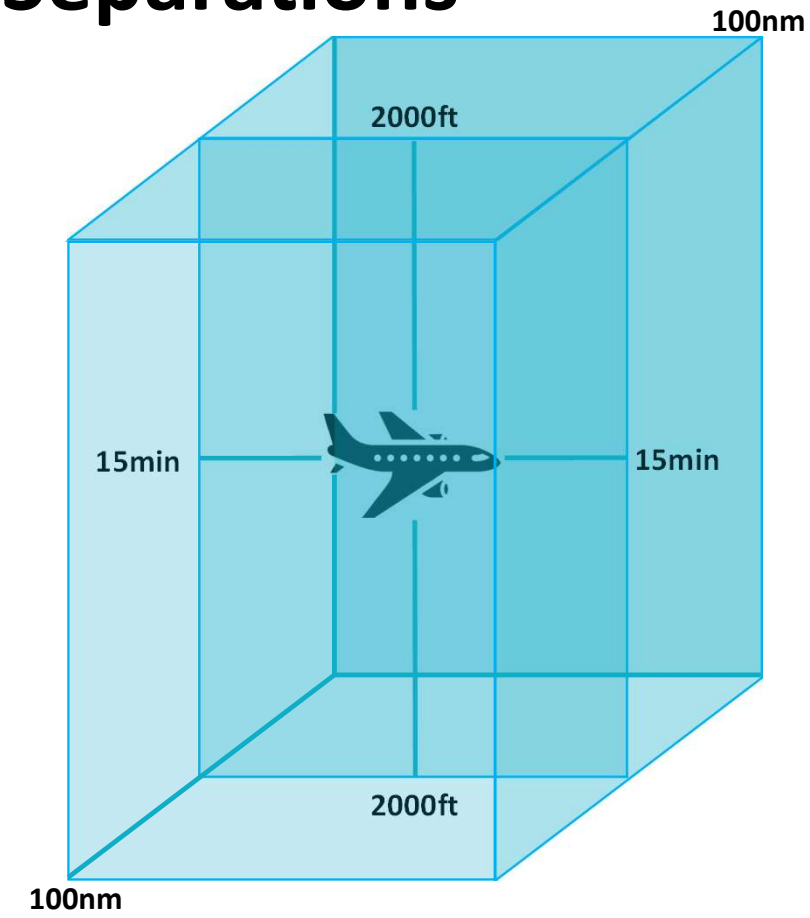
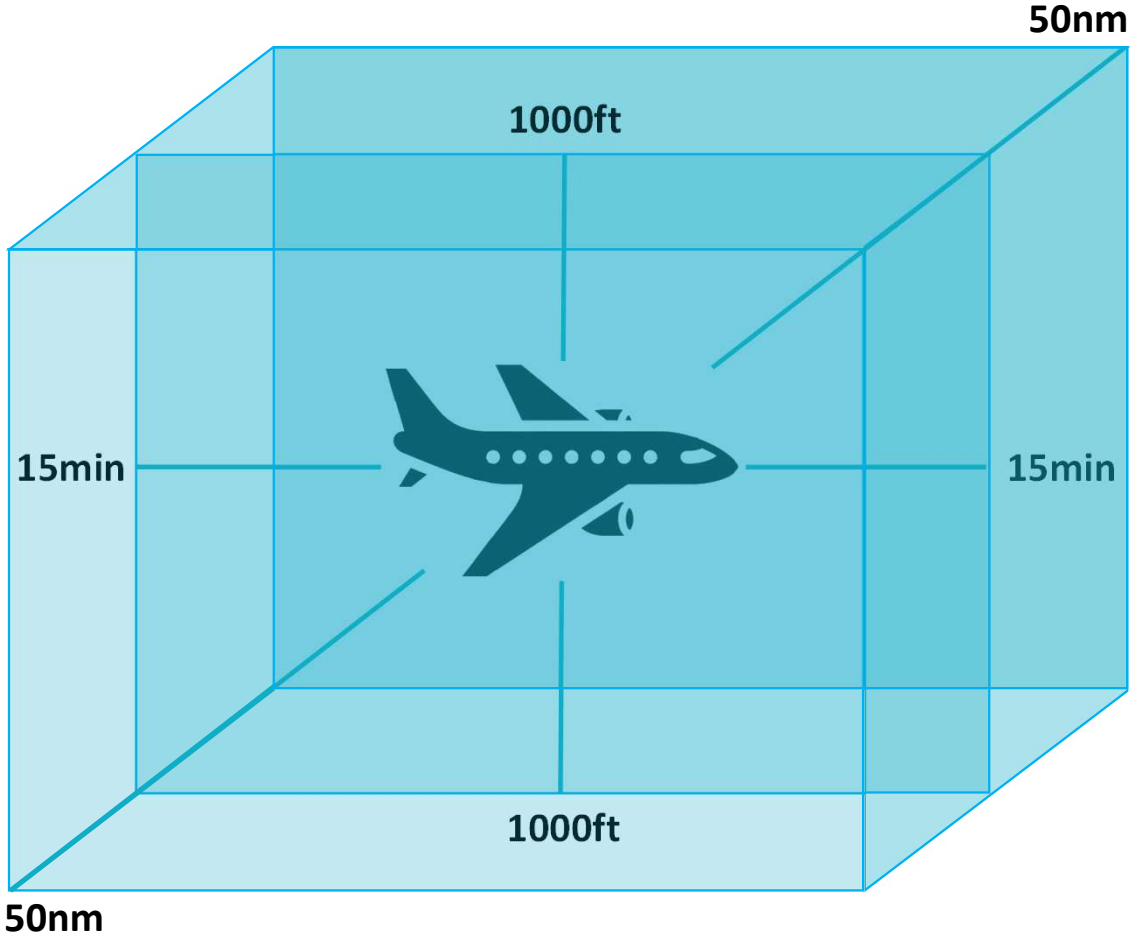


# erformance Based Separations



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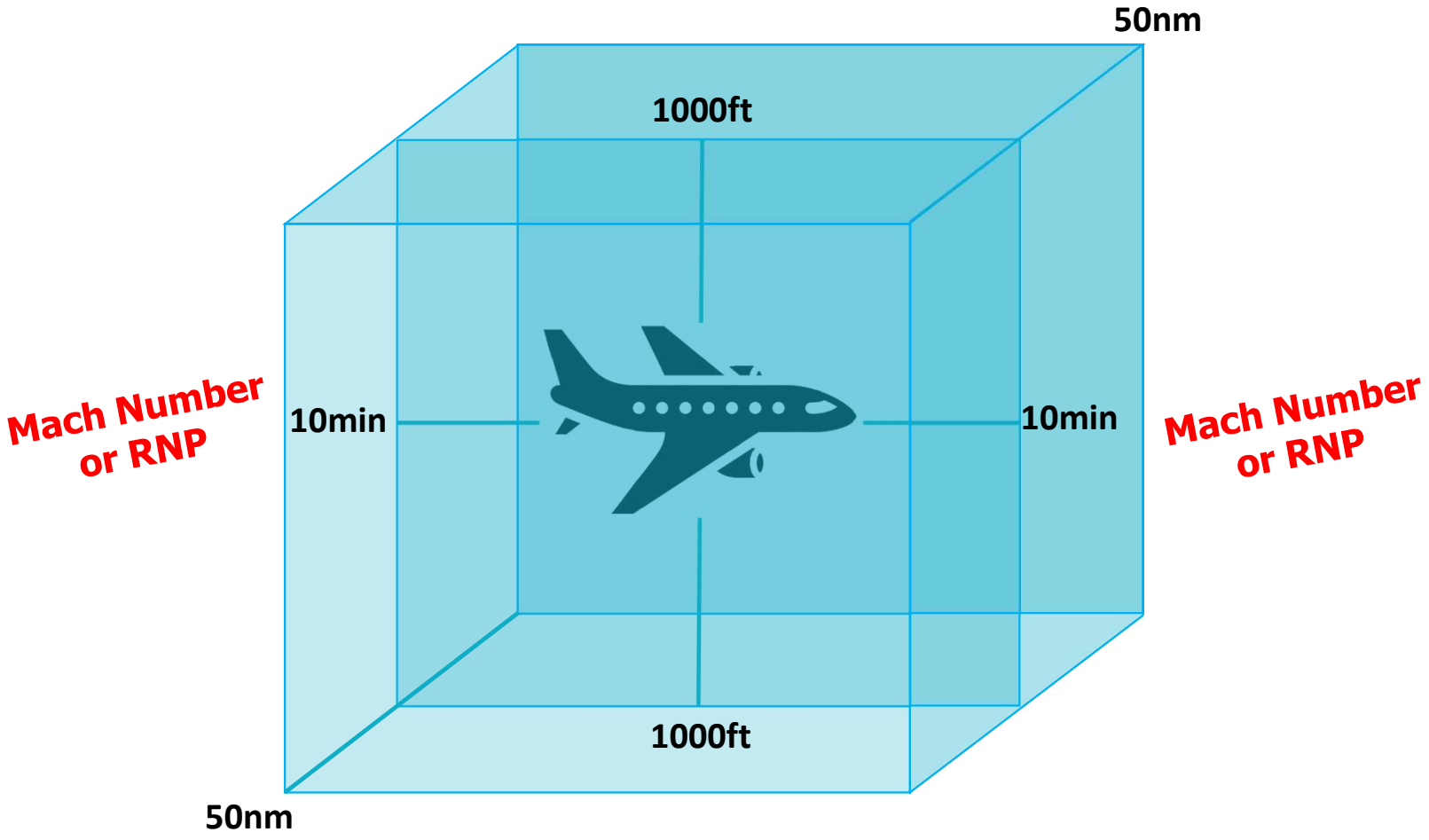

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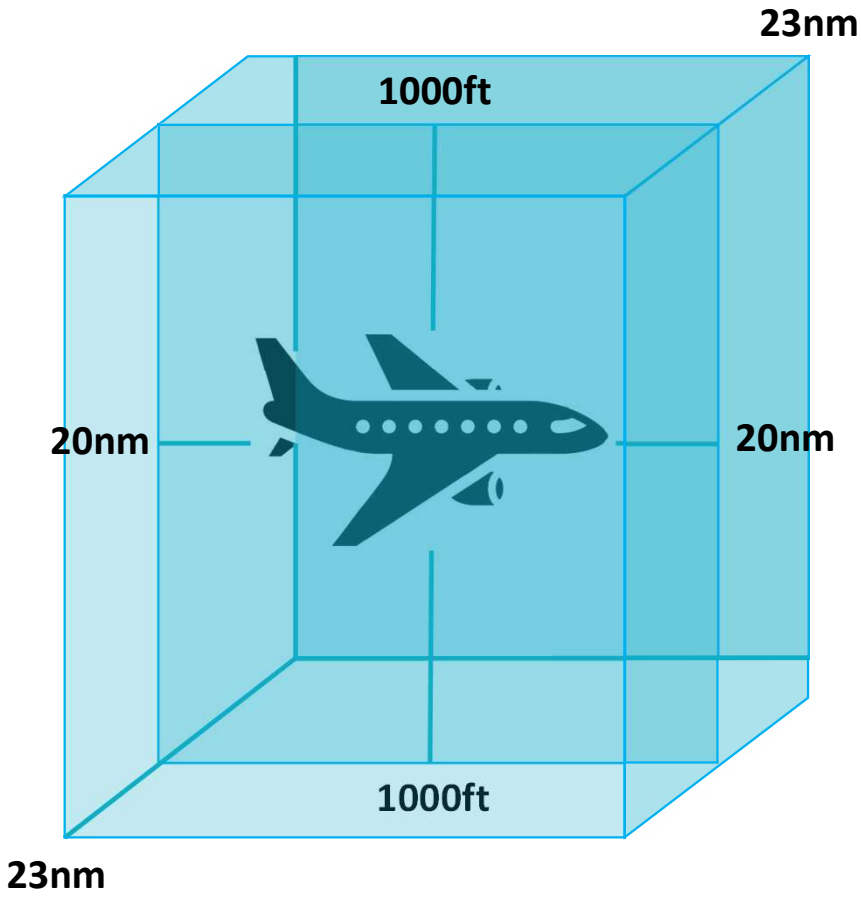



**RNP4 or better**

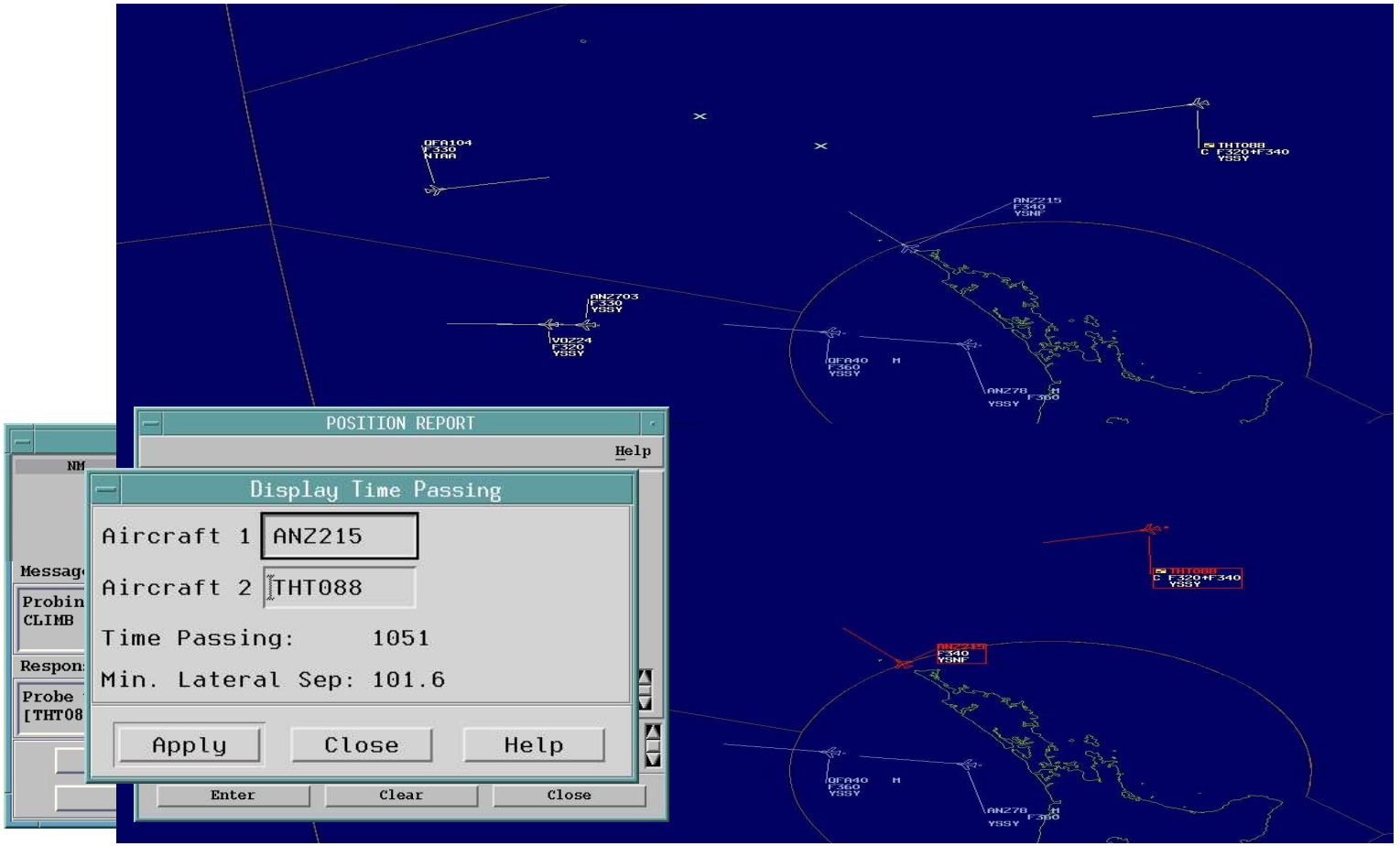
# OCS Conflict Indications

- OCS displays conflicts to Controllers using two categories based on the time to loss of separation:

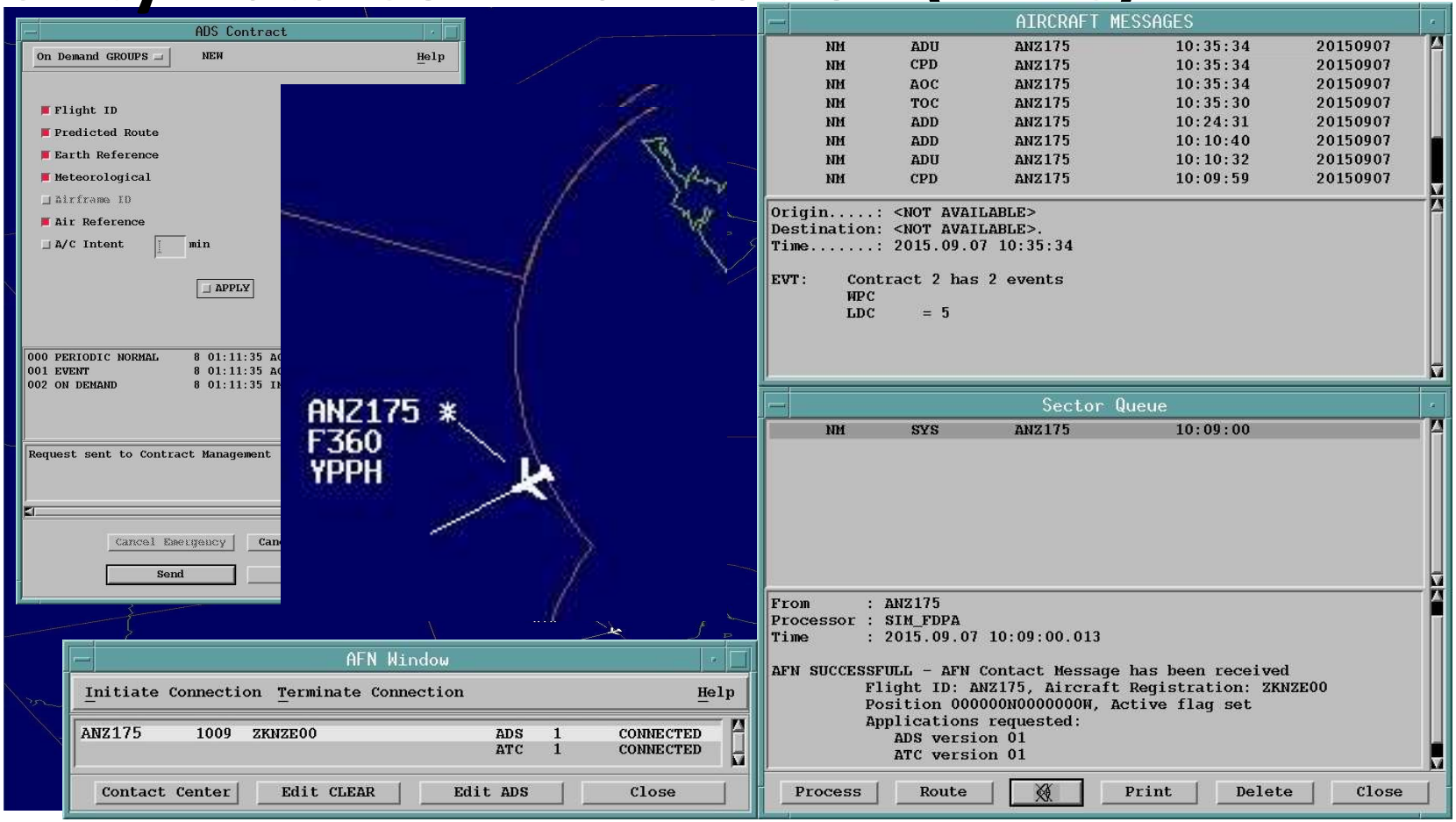
| CATEGORY | DESCRIPTION | OCS INDICATIONS | CONTROLLERS RESPONSIBILITIES |
|---|---|---|---|
| Advisory | Where the predicted loss of separation is more than 30 minutes in the future | ORANGE | In normal circumstances immediate resolution is not required |
| Actual/Imminent | Where the predicted loss of separation is equal to or less than 30 minutes in the future | **RED** | Immediate resolution is required |

# Controller Discretion vs OCS

## Example



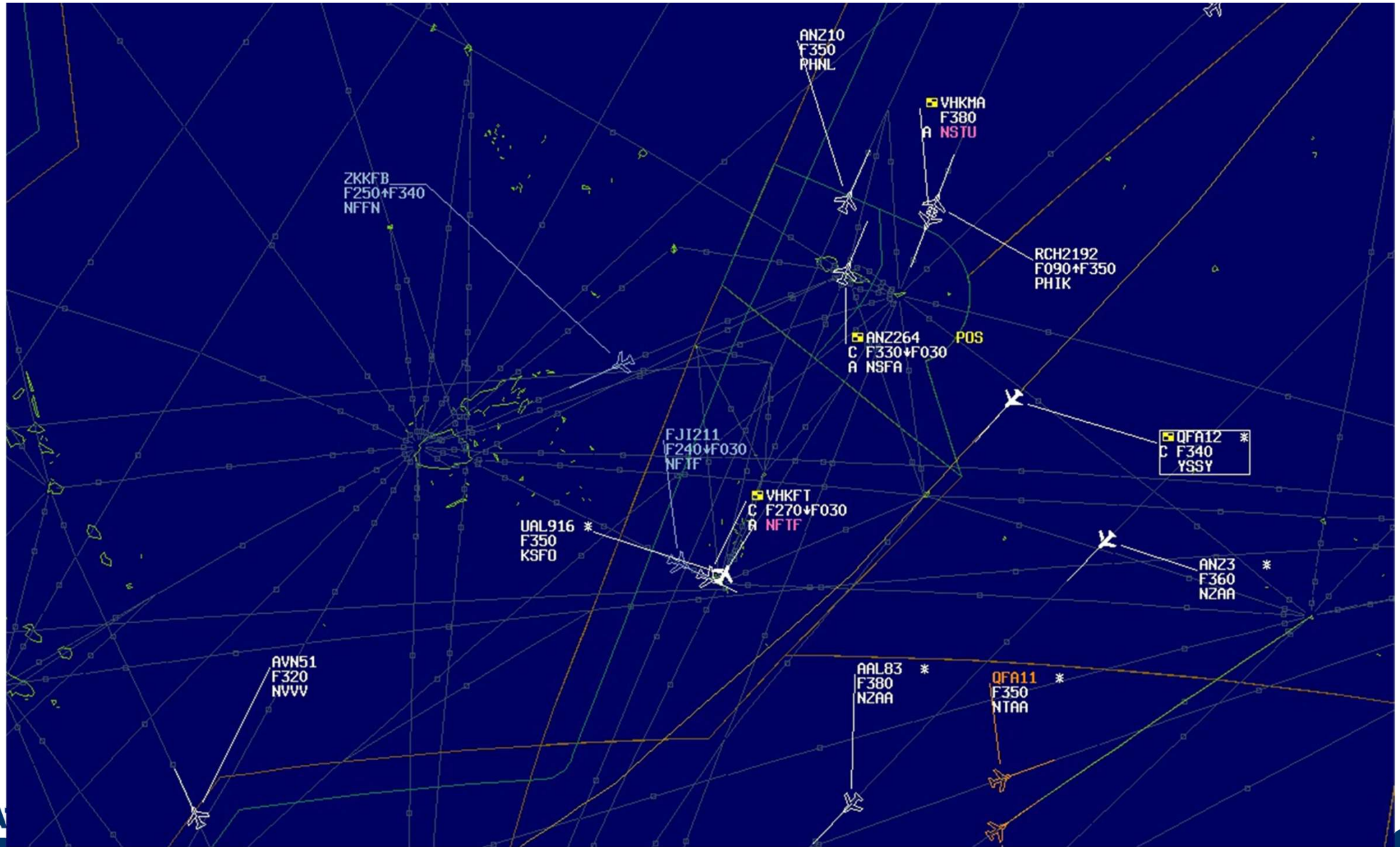
# DLC, ADS, and
# S Interfacility Data Communication (AIDC)



# Implementation

How did daily operations, workload, and system support change after rollout?

- Efficiency was improved for airspace users,
- Software is continuously introduced and developed to ensure system capability and efficiency is optimised.
- System specialists are available 24/7 for support if required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VHKFT
C F270↓F030
A NFTF
UAL916
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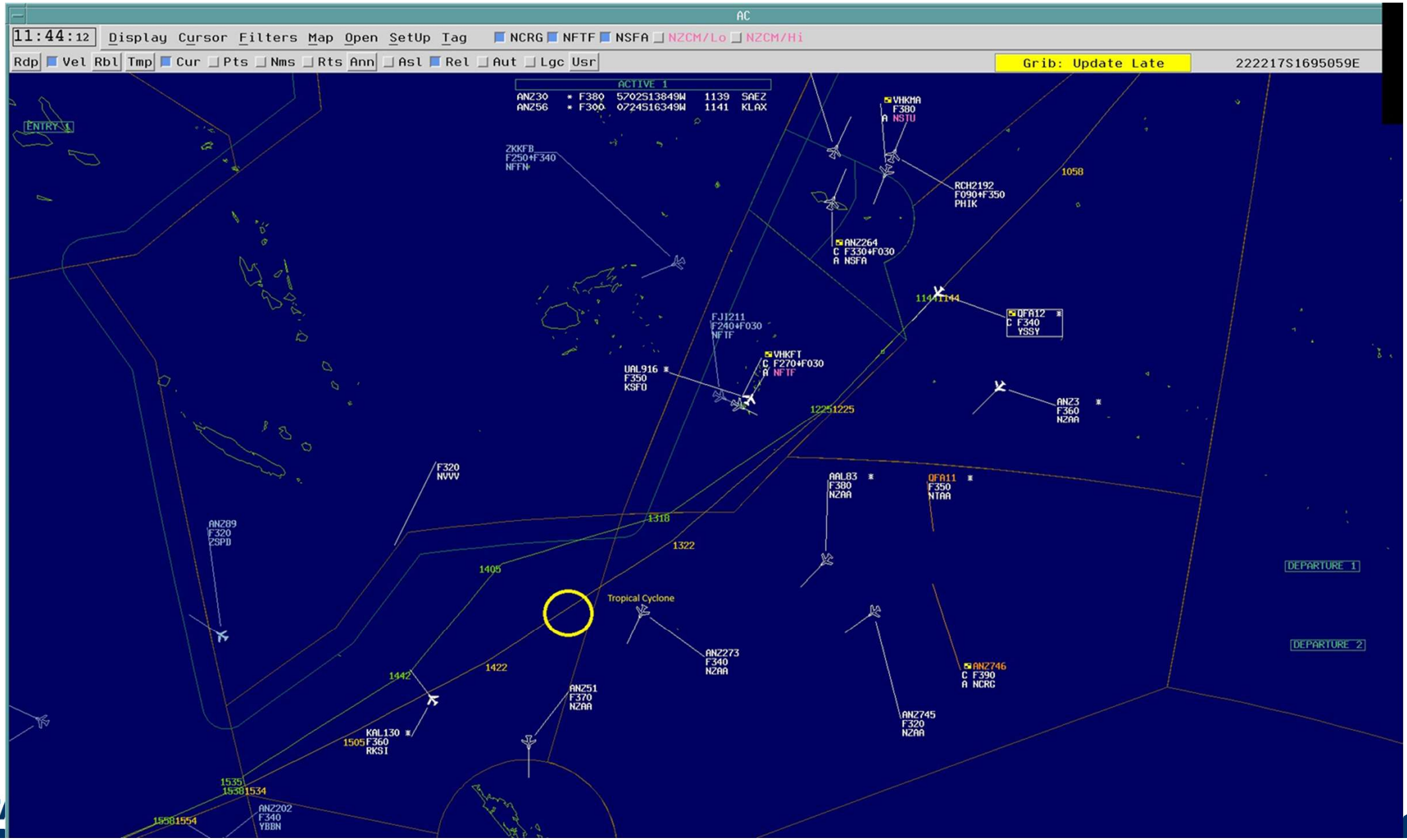
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# Safety & Human Factors

**What were the impacts on safety, efficiency, workload, and team coordination?**

## Indonesia

- Initial phases saw increased workload due to adaptation challenges, but also paved the way for improved efficiency, reduced flight distances, and emission benefits.
- Controllers shifted from fixed-route management to **strategic trajectory monitoring**, with team coordination becoming a critical element of safe and efficient operations.
- Improved efficiency, reduced flight distance & emissions.

## Safety & Human Factors

**What were the impacts on safety, efficiency, workload, and team coordination?**

New Zealand (pros)

- Safety enhanced permitting flexibility for weather avoidance and other contingencies.
- Efficiency for operators has increased given feedback and frequency of UPRs planned.
- Higher traffic density permitted.
- Procedures were developed with neighboring ATSUs to accommodate system and procedure idiosyncrasies

# Safety & Human Factors

**What were the impacts on safety, efficiency, workload, and team coordination?**

New Zealand (and Cons)

- Workload may increase due to creation of congestion points.
- Vigilance required when coordination points consist of late/long coordinates as opposed to published waypoints.
- Impact on availability of levels within congested areas/sectors.
- Performance based separations not applicable to some users resulting in economic penalty.

# Lessons & Recommendations

**What improvements, tools, training, and ATCO involvement are needed for the future?**

## Indonesia

- Continue **involving ATCOs** in design, simulation, and evaluation phases to harness frontline insights.
- Expand **simulation-based training** to cover varied operational scenarios, including cross-FIR coordination and contingency handling.
- Invest in **advanced decision-support** tools such as trajectory prediction, 4D conflict detection, and automated coordination systems as recommended by ICAO and IATA.
- Sustain and widen the **feedback loop** between controllers, system developers, and stakeholders to support ongoing enhancements.

# Lessons & Recommendations

**What improvements, tools, training, and ATCO involvement are needed for the future?**

## New Zealand

- Urge operators to equip aircraft accordingly to permit widespread utilisation of performance based separations for UPR uptake.
- Development and implementation of minimum separation criteria.
- Technology investment for system capacity enhancement and seamless cross boundary coordination.
- Cyclical or recurrent training programs based on safety management system and incident reporting.
- Development of contingency operations in the event PBS become unavailable, unexpected weather or other airspace events occur.

# Summary

Air Traffic Control as SME for any airspace procedure or development provides valuable connection between resources and realisation.

Complete stakeholder engagement from inception ensures efficient use of resource, identification of challenges and aligns future technologies and strategic plans with implementation practicalities

# Conclusion

And ANY QUESTIONS?

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