The Free Route Airspace Implementation Workshop / 2

Bangkok, Thailand

13th Nov 2024

This event is jointly organised with

EU-CHINA APP | EU-ROK APP | APP EU-Japan | EU-SOUTH ASIA APP | EU-ASEAN SCOPE APP | Funded by the European Union | EASA European Union Aviation Safety Agency | EUROCONTROL

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FREE ROUTE OPERATION (FRTO) IMPLEMENTATION IN INDONESIA ID

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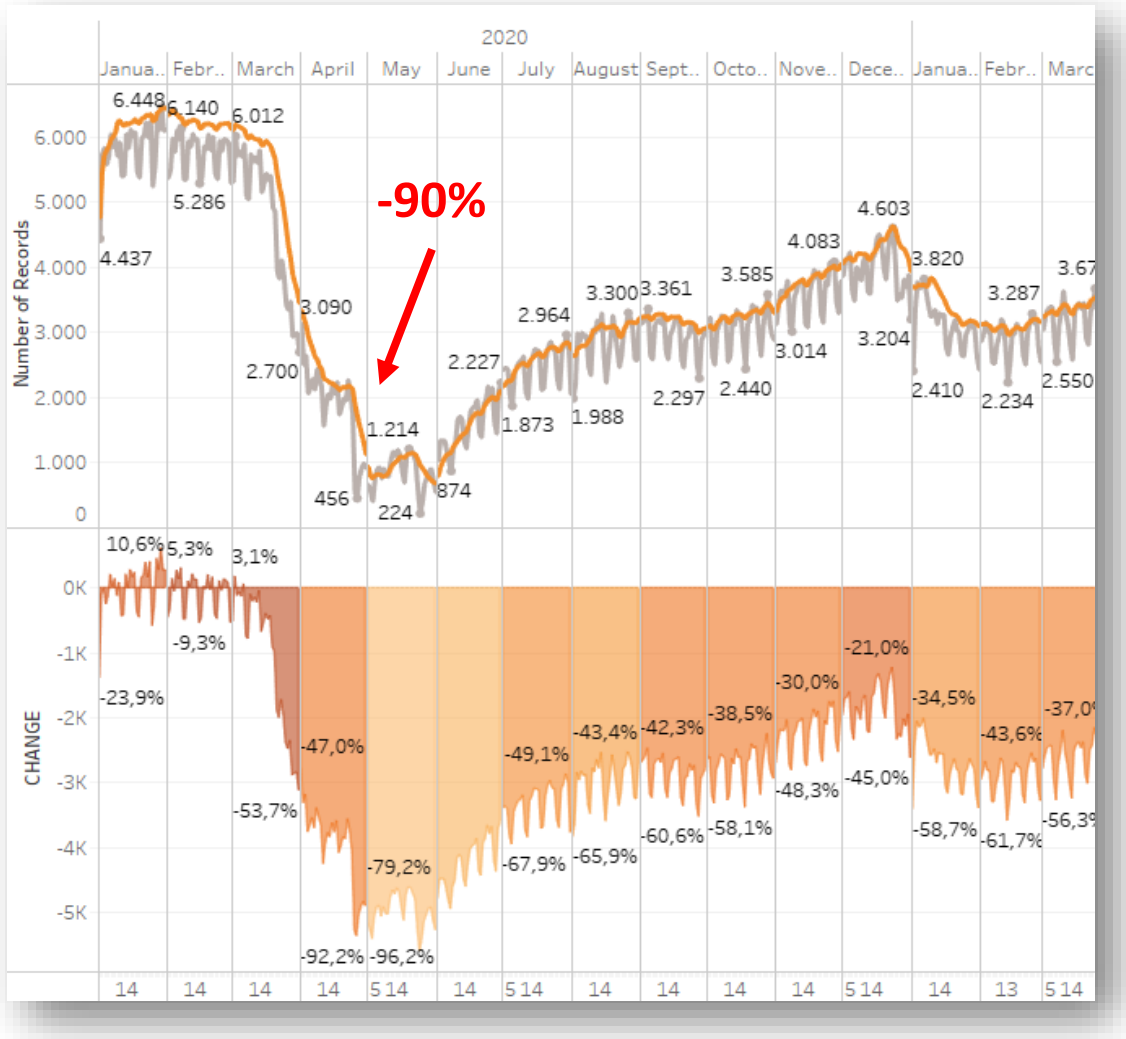
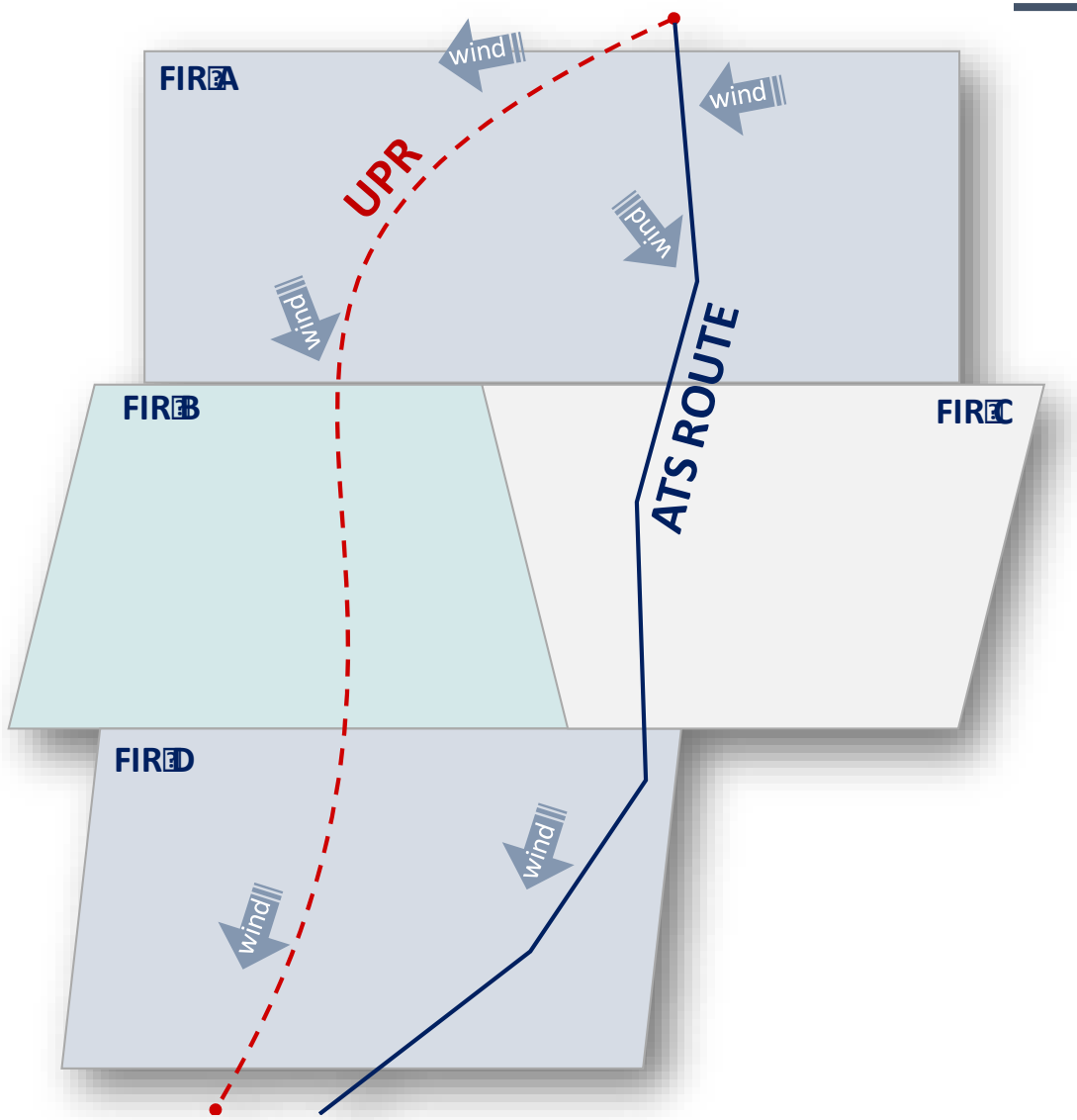
INITIATING UPR IN PANDEMIC

- In the event of COVID-19 crisis, around May-June 2020, where traffic level experiencing significant downturn, AirNav, Indonesia DGCA and IATA launched User Preferred Route (UPR) trial to act as a stimulus for traffic growth;
- AirNav discussed this initiative internally with ATC association to gain controllers buy-in



WHAT IS UPR?

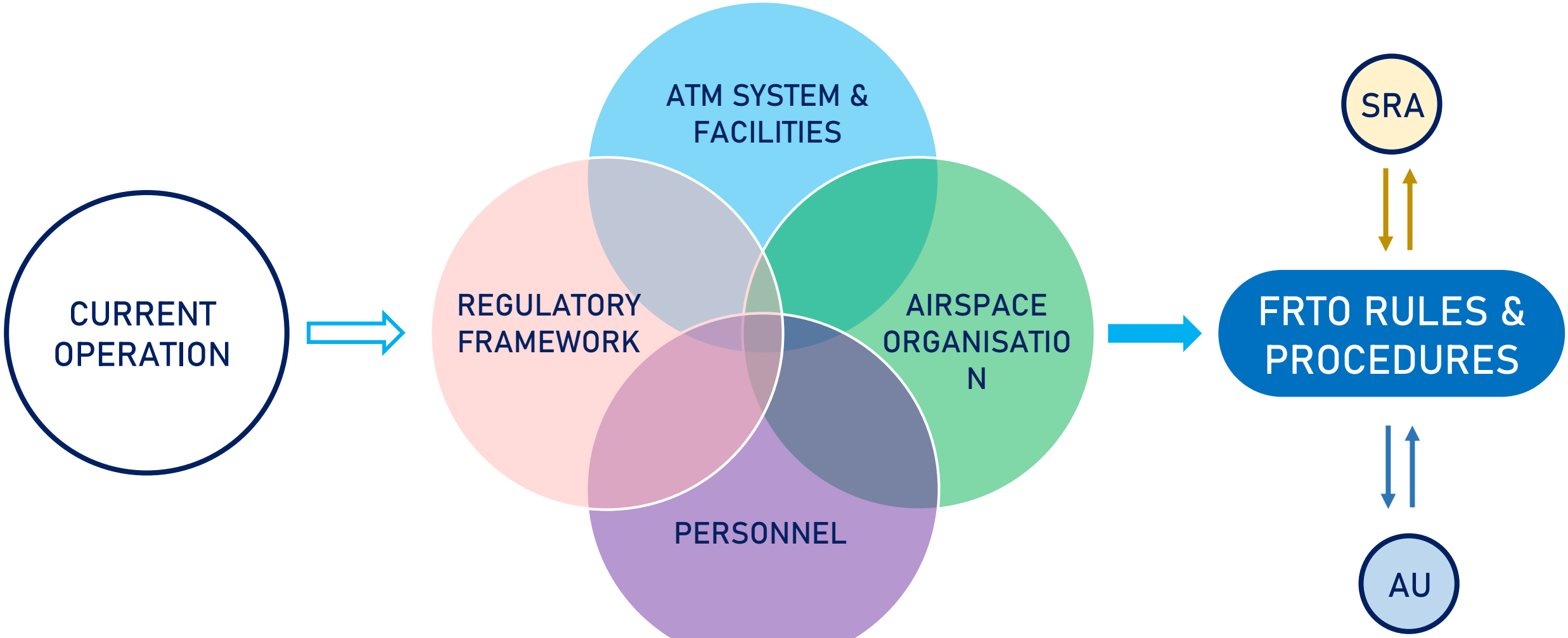
- **USER PREFERRED ROUTE (UPR)** is based on **FREE ROUTE OPERATION (FRTO)** concept where Airspace Users may **freely plan a route** between a defined entry point and a defined exit point with the possibility to route via intermediate way points **without referring** to the ATS route network:
  - DRO (Direct Route Operation): Waypoints
  - Full FRTO: Designated points (LAT/LONG)
- UPR allows the airlines to plan their flight through the **most efficient route** taking into consideration **wind speed & direction, turbulence, temperature, aircraft type & performance**



FRTO INDONESIA TIMELINES

- Published on AIRAC AMDT Nr. 135 Date 24 AUG 2023
- Effective 5 OCT 2023
- Rules:
  - FL330 up to FL600 inclusive
  - Waypoint & Designated Point (Lat/Long)
  - International & Overflying
  - Exit Waypoint

FRTO IMPLEMENTATION FRAMEWORK



REGULATORY FRAMEWORK

REGULATION & PROCEDURES

Review the relevant regulations and procedures to ensure that the regulatory framework can accommodate flexible routing:

- Direct Routing
- Lat/Long
- Flight planning
- PBN

- Policy
- Regulation
- ATS Manual
- ATC procedures
- LOCA

Examples:

Policy

Minister Decree no. PM 55/2016 regarding Air Navigation Policy, Chapter IV. Air Traffic Routes. Article 30:

1) Flight operating from one point to another must follow prescribed air traffic routes.
2) Air traffic routes, as referred to in paragraph (1), may be altered or modified by the Air Navigation Service Provider/ ATC or at the request of the pilot, considering flight safety and security.

ATC Procedures

- PBN Separation on MOS 170

LOCA

- Clauses to transfer at any point in the boundary as agreed by each other

AIRSPACE ORGANISATION

- *ICAO define Airspace Organization and Management (AOM) as: "The dynamic and flexible management of airspace structures and routes in order to meet the needs of airspace users as closely as possible while ensuring the safety and efficiency of air traffic."*
- *In alignment with ICAO's AOM concept, Free Route Operation enhances flexibility and efficiency in airspace management by allowing airspace users to freely plan their routes within available FIRs, rather than being restricted to fixed ATS routes*

AIRSPACE ORGANISATION & MANAGEMENT

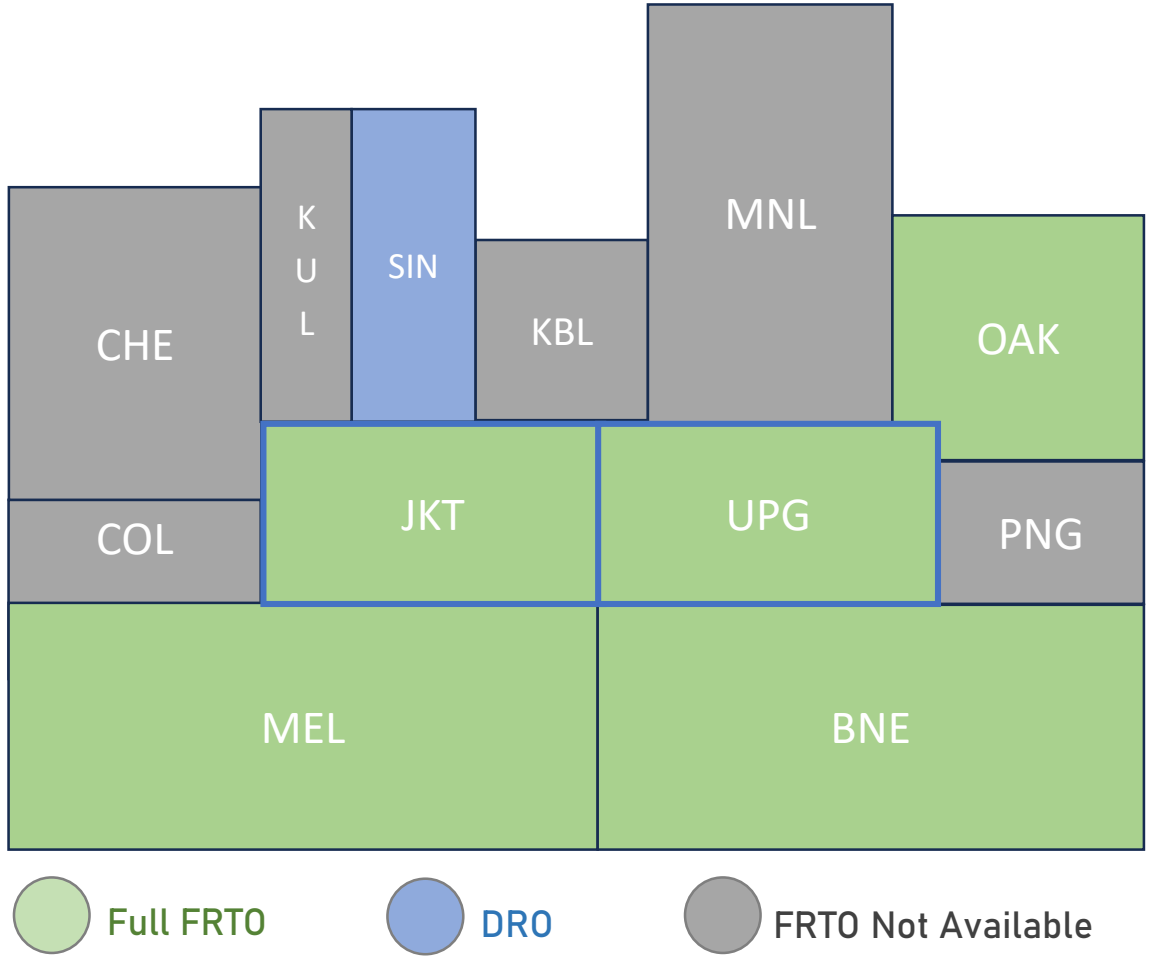
FRTO availability

FRTO differs from the traditional fixed ATS route network, as airspace users are informed about available FIRs for FRTO (and its rules), not specific ATS routes:

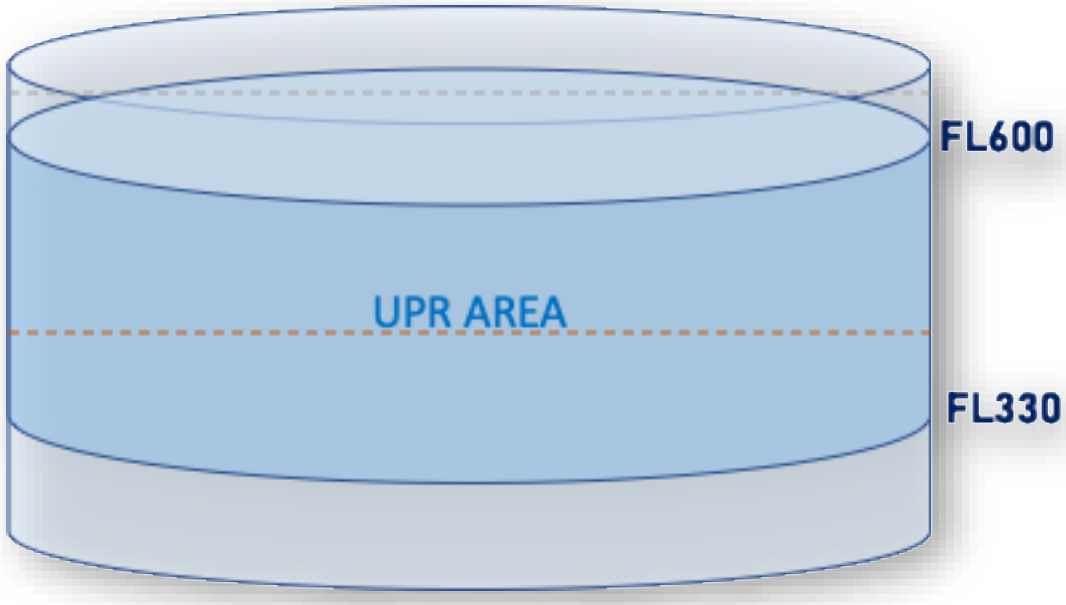
- Verify FRTO implementation status around JKT FIR and UPG FIR

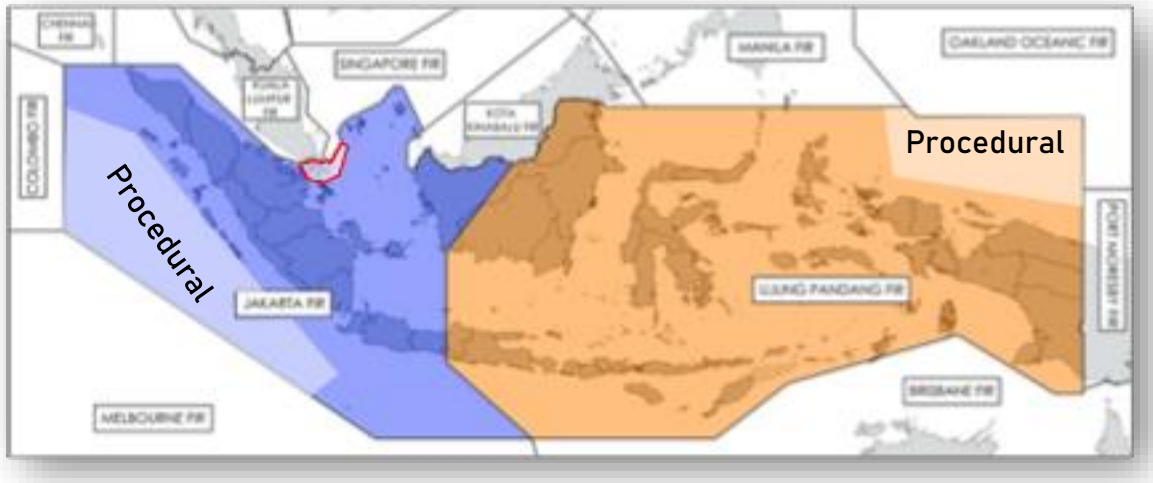
PBN as FRTO enabler

- PBN concept
  - PBN infrastructure: only GNSS
  - PBN spec (enroute oceanic): RNP10
- PBN separation (PANS ATM): MOS 170



VERTICAL & HORIZONTAL LIMIT





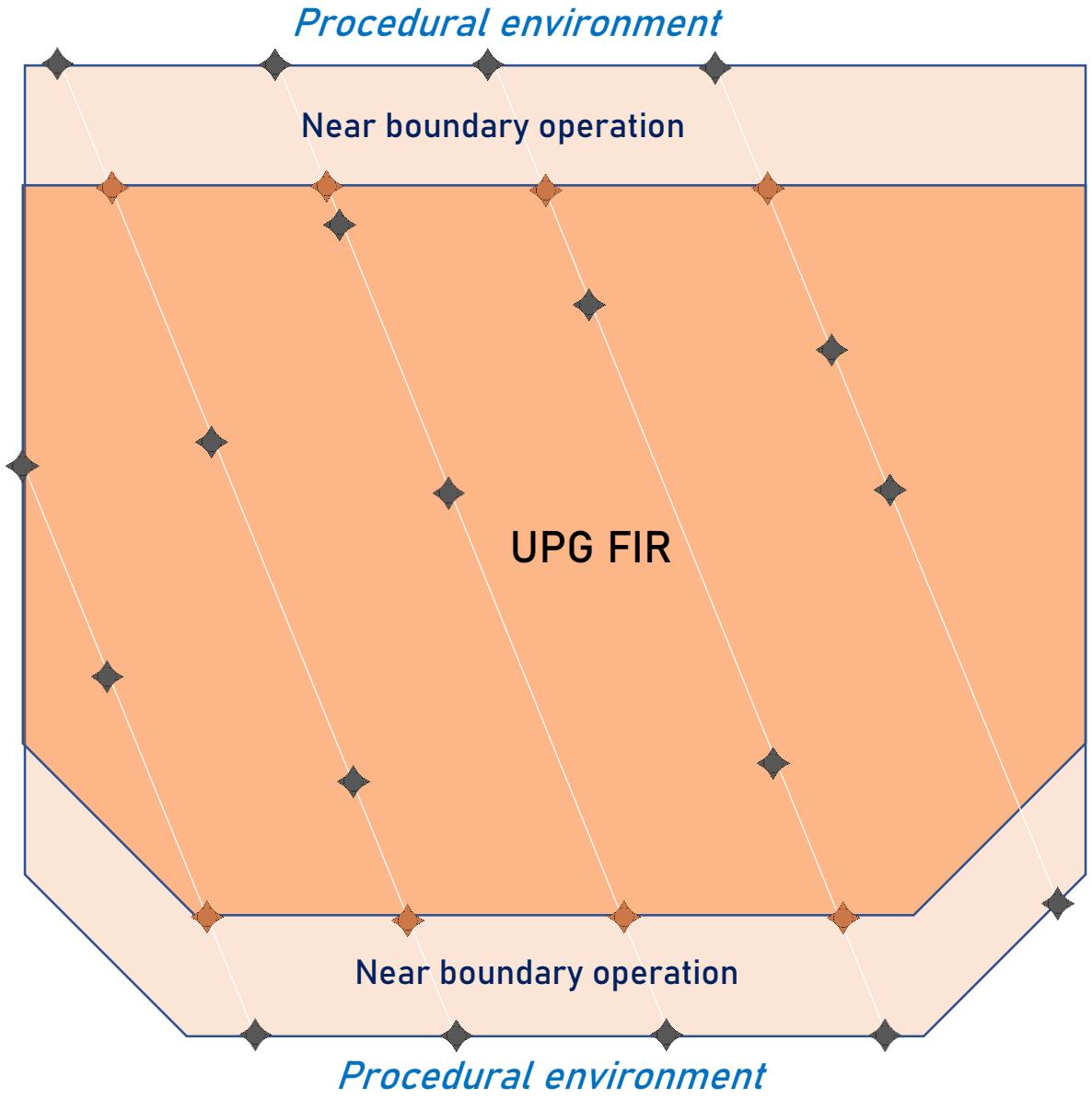
Indonesia FRTO implementation

- Vertical: FL330 up to FL600 inclusive
- Horizontal: JKT FIR and UPG FIR
- Entry/Exit Point: Waypoint (Lat/Long when Cross-Border FRTO established)
- Remarks UPRINA on FPL Item 18

Key Consideration

- Based on operational requirements, not necessarily of FIR or sector boundaries
  - ✓ Control airspace on ACC sectors
- Complexity of airspace
  - ✓ Outside climb/descend segment (CGK)
- Application of separation
  - ✓ Major sectors are surveillance service, but still have some procedural area

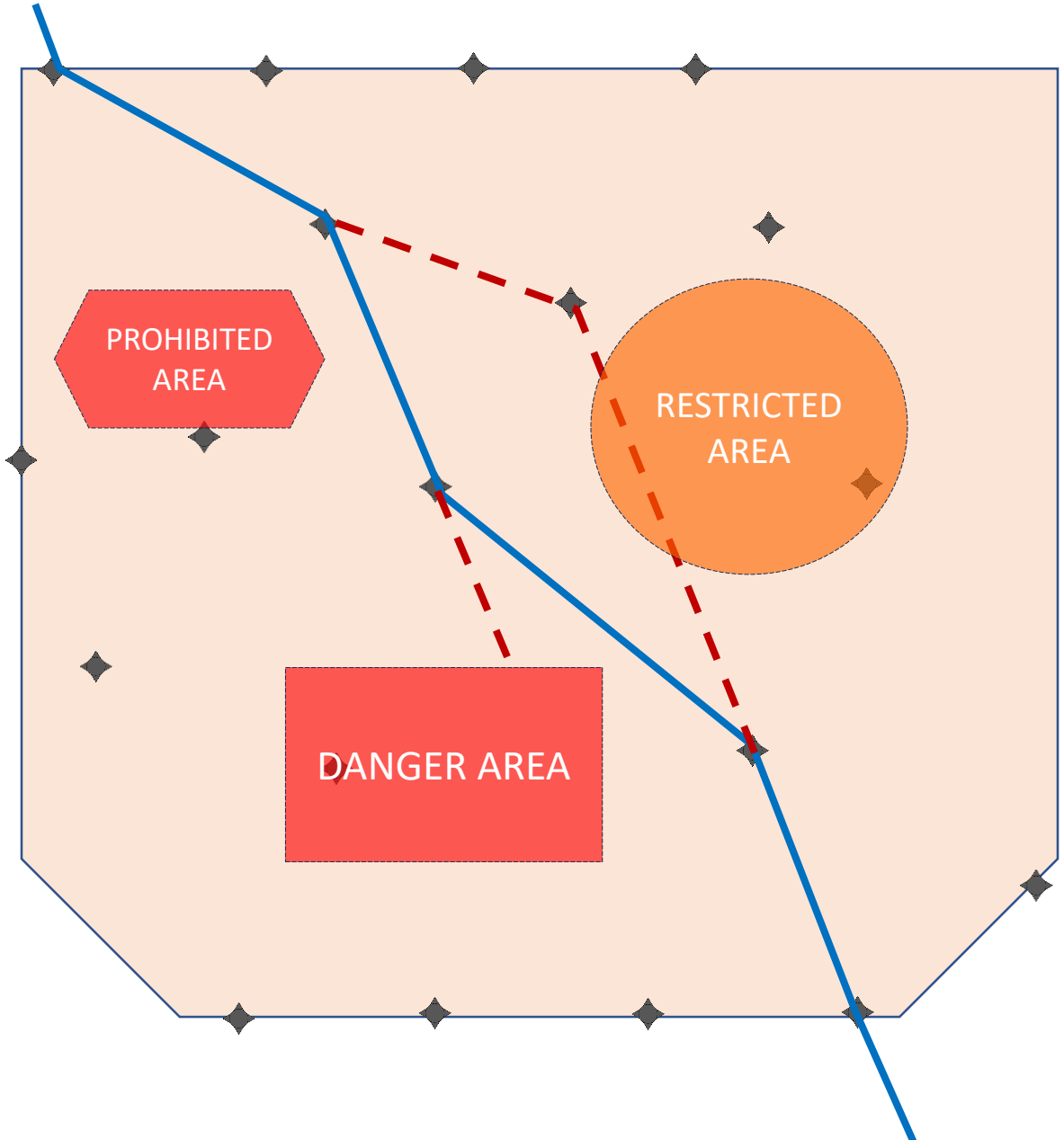
NEAR BOUNDARY OPERATION



It's essential to address the complexities of Near Boundary Operations (NBO) and coordinate closely with adjacent ATC units to ensure optimal airspace integration and traffic management:

- ✓ Check LOCA with adjacent ATC unit
- ✓ On initial implementation consider to limit FRTO in areas outside NBO
- ✓ Engage in discussions with adjacent ATC units to facilitate full-area FRTO implementation.
- ✓ Ensure applying appropriate separation standards for flights at NBO
- ✓ Next phase, exploring cross-border FRTO

AIRSPACE RESERVATION



- FRA does not change procedures to avoid Prohibited, Restricted, Danger (PRD) and other airspace reservation
- Ideally Flexible Use of Airspace (FUA) is put in place, to optimized FRA implementation
- Ensuring the consistency of airspace reservation data and information between AIP, NOTAM issued by AIS, and airline operations
  - e.g., Danger Area over international airspace
- Tactically ATC will make sure flight trajectories does not conflict with PRD and airspace reservation

ATM SYSTEM & FACILITES

ATM SYSTEM & FACILITIES

Flight Planning system and ATM Automation Systems (ATMAS) are critical enablers of Free Route Operation, supporting optimized trajectories, improved efficiency, and enhanced safety

FLIGHT PLANNING SYSTEM

- WEB-BASED FLIGHT PLAN

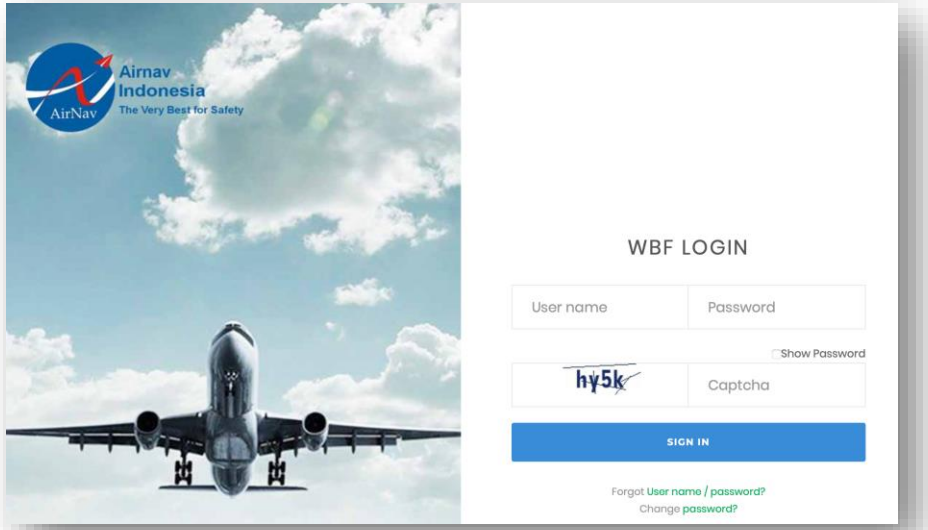
ATM AUTOMATION SYSTEM

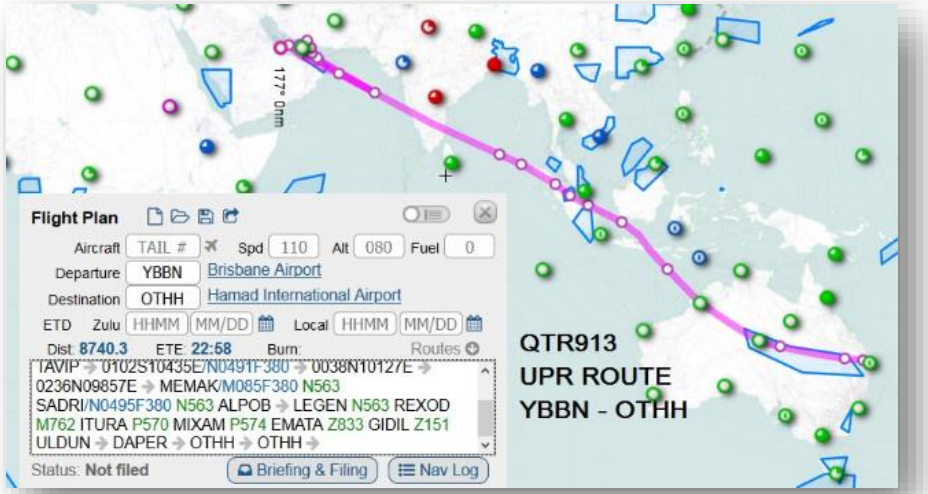
- JKT ACC: COMSOFT
- UPG ACC: THALES TOPSKY

AERONAUTICAL CHART

- NAVEARTH
- SKYVECTOR

FLIGHT PLANNING SYSTEM

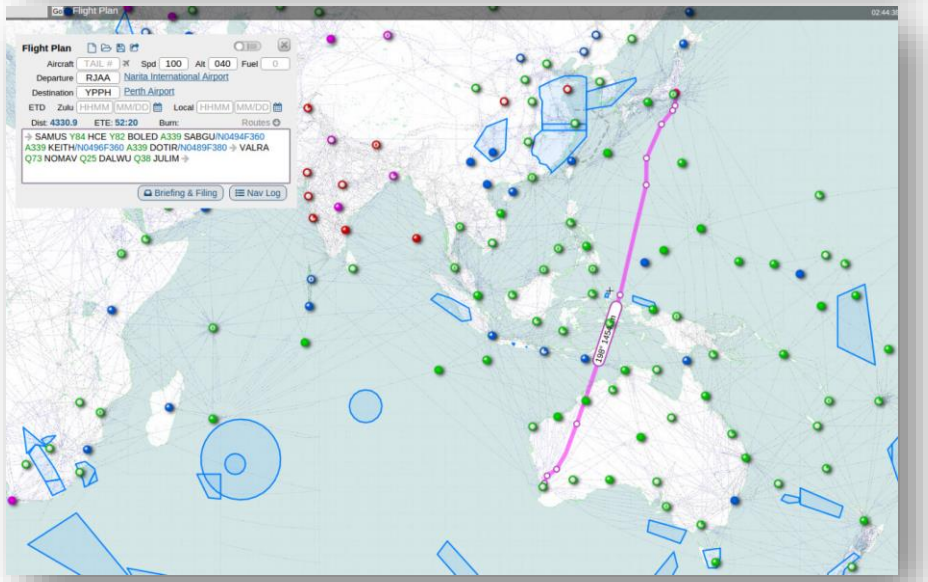




- Ensure Flight Planning system is supporting flexible routing
  - Flight planning framework based on ICAO Annex 11 and Doc 4444 (PANS-ATM), e.g. LAT/LONG format
  - DRO: WAYPOINTS to WAYPOINTS
  - FRTO: LAT/LONG

- Integrate with aeronautical chart applications, such as SkyVector or NavEarth, to preview flight trajectories.
  - Evaluate the trajectory across Air Traffic Control (ATC) sectors
  - Overlay it with Prohibited, Restricted, and Danger (PRD) areas, as well as airspace reservations, for ATSRO to ensure compliance and prevent any unauthorized entry.

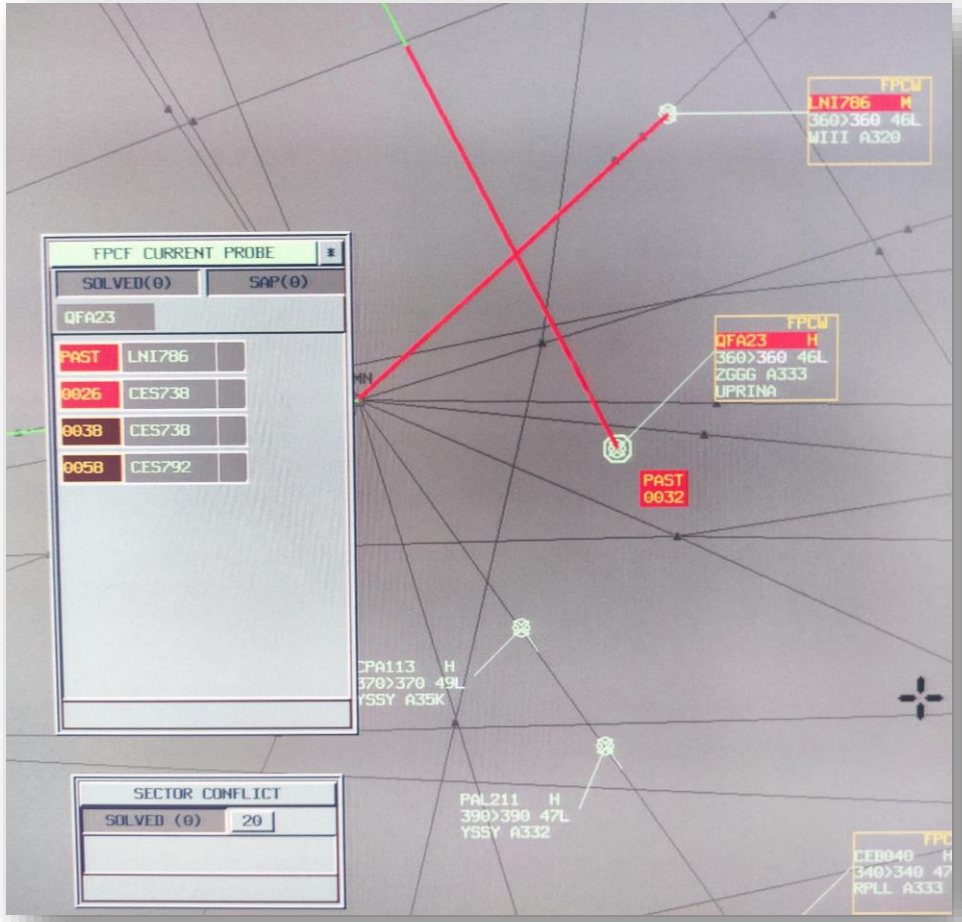
ATM AUTOMATION SYSTEM (ATMAS)



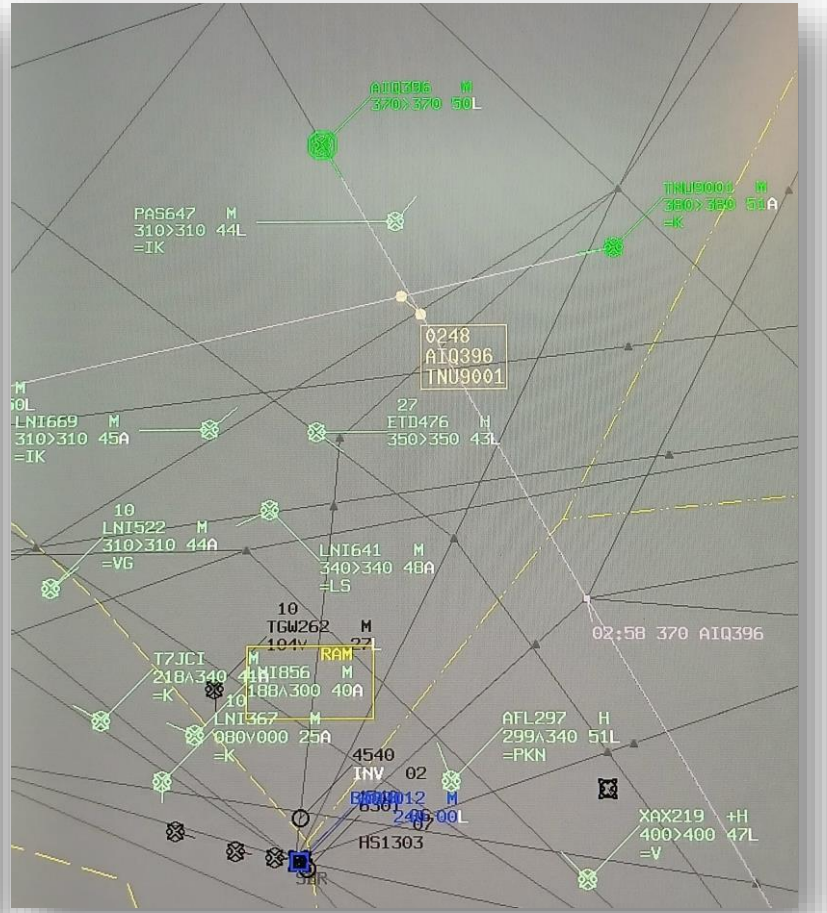
Ensure that the ATMAS supports flexible routing, including the following capabilities:

- Volume-based FDRG (Flight Data Region)
- Waypoint-to-waypoint routing (DRO)
- Lat/Long trajectories (full FRTO)
- Manage PRD and airspace reservations.
- Conflict Detection and Resolution tools:
  - Flight Plan Conflict Probe (FPCP)
  - Medium-Term Conflict Detection (MTCD)
  - Estimate Time Over Passing (TOP)
- Relevant safety Nets
  - Route Adherence Monitoring (RAM)
  - Dangerous Area Infringement Warning (DAIW)

CONFLICT DETECTION & SAFETY NETS

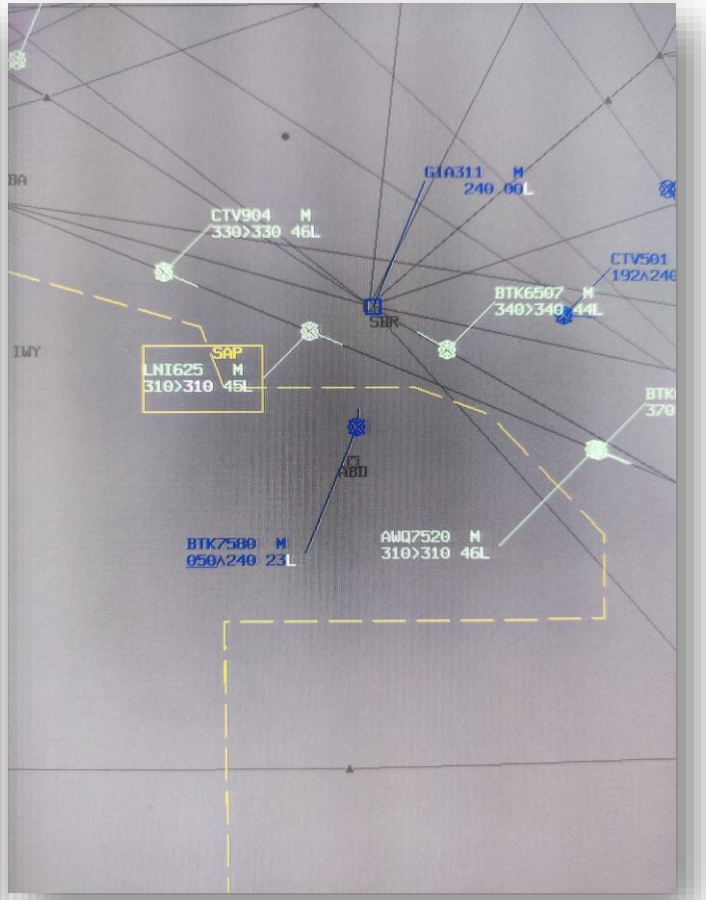


FPCF



TOP

RAM



DAIW

PERSONNEL

PERSONNEL

- Impacted personnel
  - ATC – ACC sectors: JATSC & MATSC
  - ATS-RO : FPL Center
- ATC Procedures & Working Methods
  - Temporary SOP → Permanent
  - Traffic characteristic
- ATC Training
  - National training on UPR (online)
  - PBN refreshment training
  - Local training for procedures
  - ATC Simulation
  - Performance check
- *More on ATC training in the next session!*

USAGE & BENEFIT

USAGE & BENEFIT

YEAR	Number of Flights	Carbon Emission Reduction (CO_2)	Fuel efficiencies (USD)	Remarks
2020	68 flights	64 Tons	± 40.800	-
2021	-	-	-	Peak of Pandemic
2022	128 flights	120 tons	± 76.800	-
2023	1130 flights	1067 tons	*± 1.2 M*	*Including hajj flights*
2024*	1475 flights	1374 tons	*± 1.27 M*	*Including hajj flights*

** until July 2024*

LESSON LEARNED

- Align with Airspace Users' Expectations: Engage early with Airspace Users to understand their goals and expectations for FRTO.
- Develop a Structured Implementation Framework:
  - Assess key elements—Regulatory Framework, Airspace Organization, ATM Systems & Facilities, and Personnel.
  - Prioritize Safety: Conduct thorough safety risk assessments at every stage
  - Adopt an Iterative Approach with Airspace Users: Foster a collaborative, feedback-driven process to fine-tune FRTO practices
- Start with Simple FRTO Rules: Introduce straightforward rules, like Direct Routing Operations (DRO), to allow controllers and stakeholders a manageable learning curve.
- Engage with Controller: Achieving early controller buy-in is essential for successful implementation

Thank You

ICAO