FREE ROUTE OPERATION (FRTO) IN INDONESIA_{ID} PREPARATION & IMPLEMENTATION

—

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EVP of ANS Planning – AirNav Indonesia

OUTLINE

❖ History

❖ Preparation

❖ Implementation

❖ Usage & Benefit

HISTORY

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.

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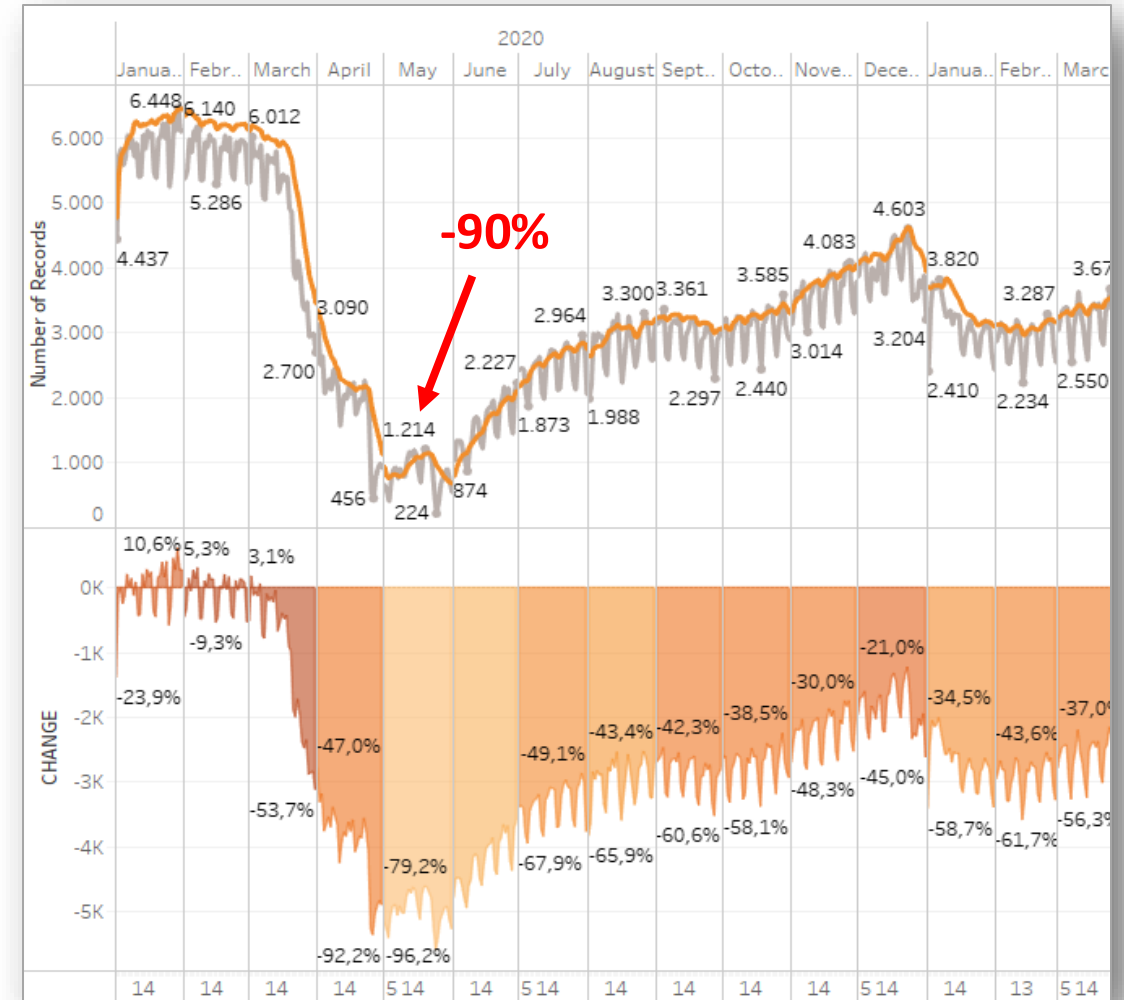
WHAT IS FREE ROUTE/UPR?

❑ USER PREFERRED ROUTE (UPR) or FREE ROUTE OPERATION (FRTO) is a 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.
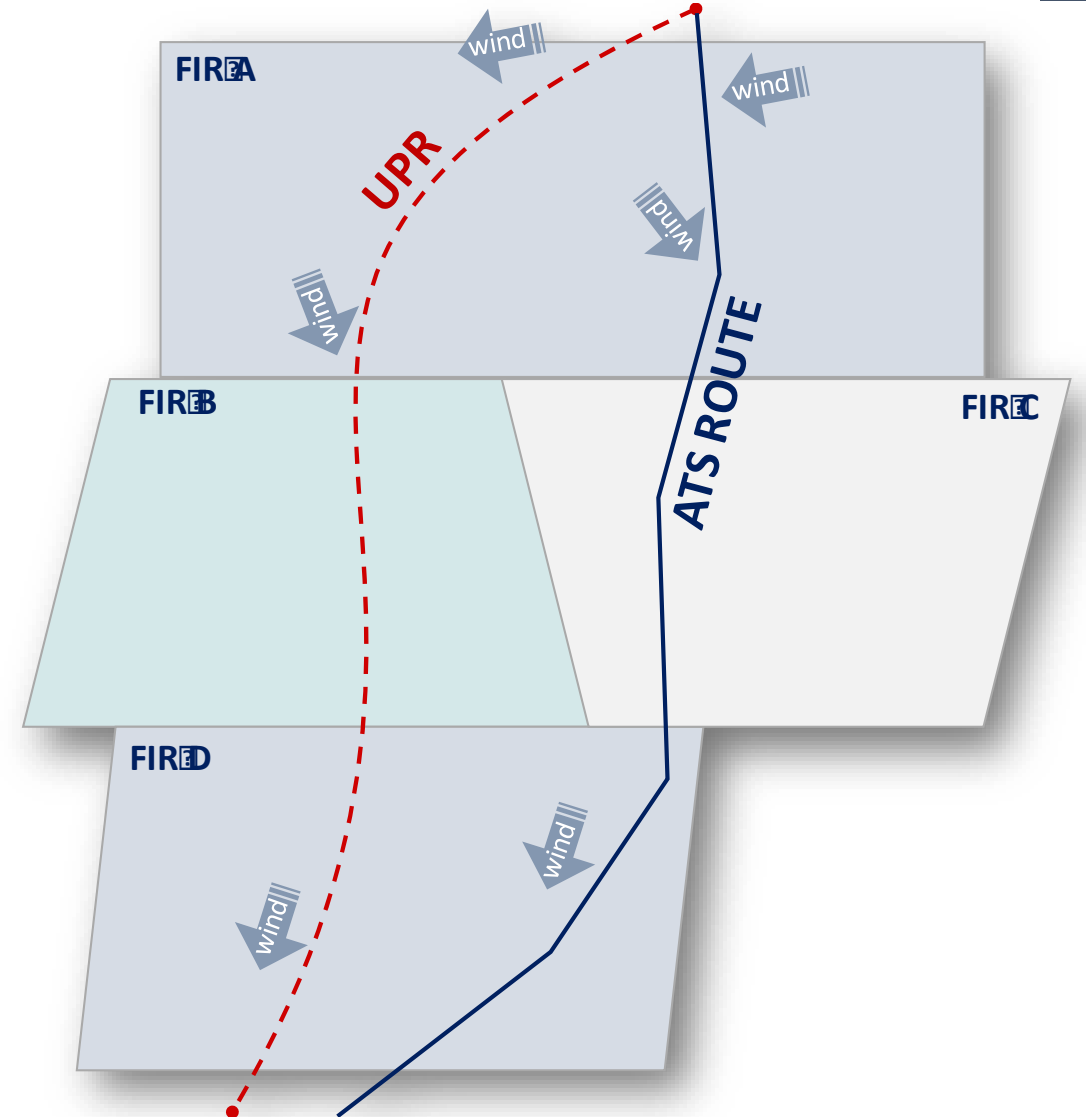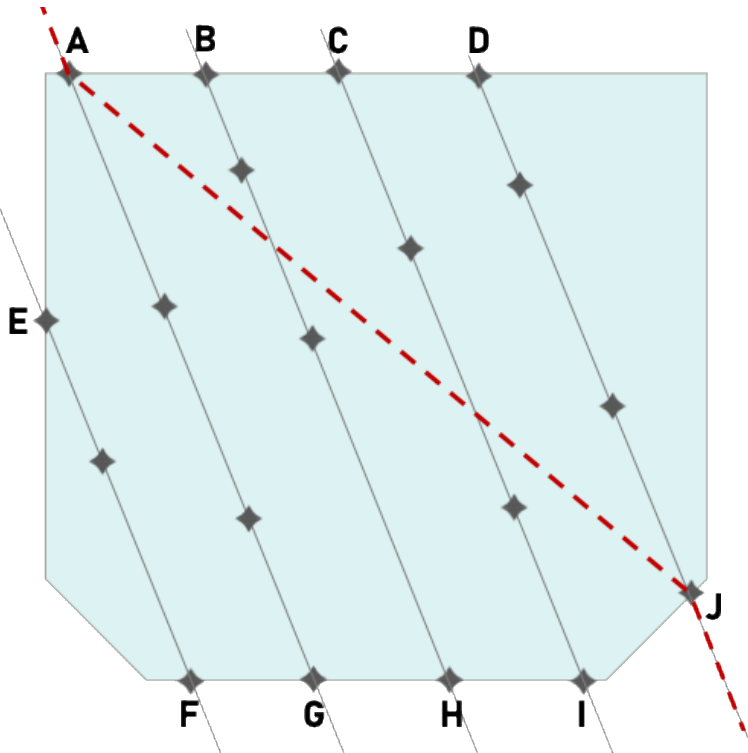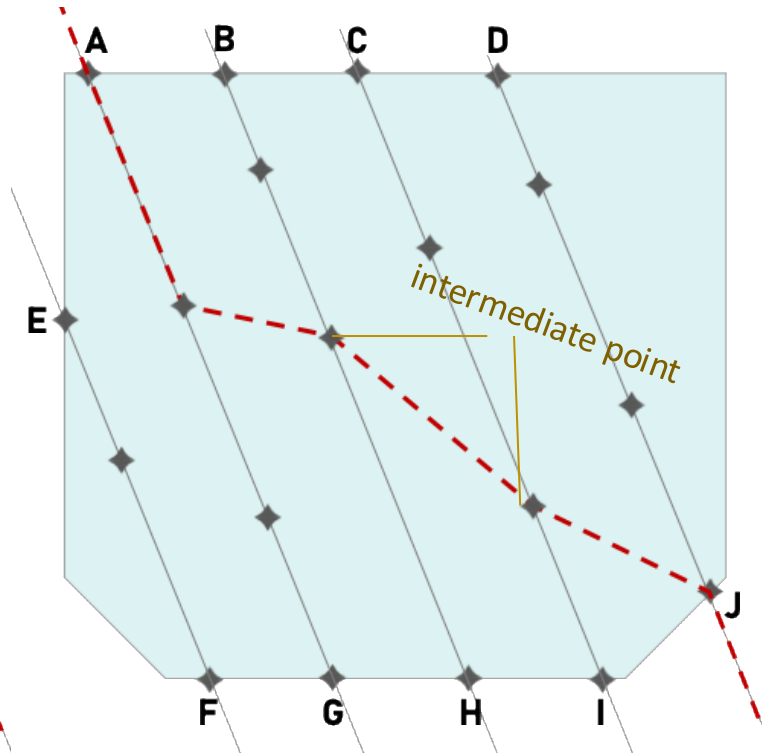
PREPARATION

TYPES OF FRTO

DIRECT ROUTE OPERATION (DRO)
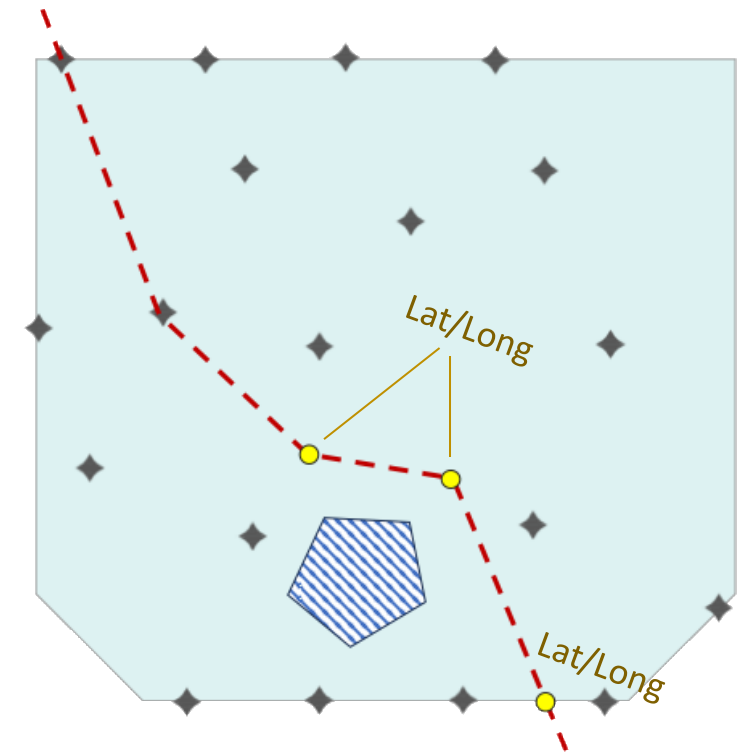
Direct ENTRY to EXIT

Direct via Intermediate Point

intermediate point

FREE ROUTE OPERATION (FRTO)

Free Route using LAT/LONG

Lat/Long

Lat/Long

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FRTO IMPLEMENTATION FRAMEWORK

Regulation Framework
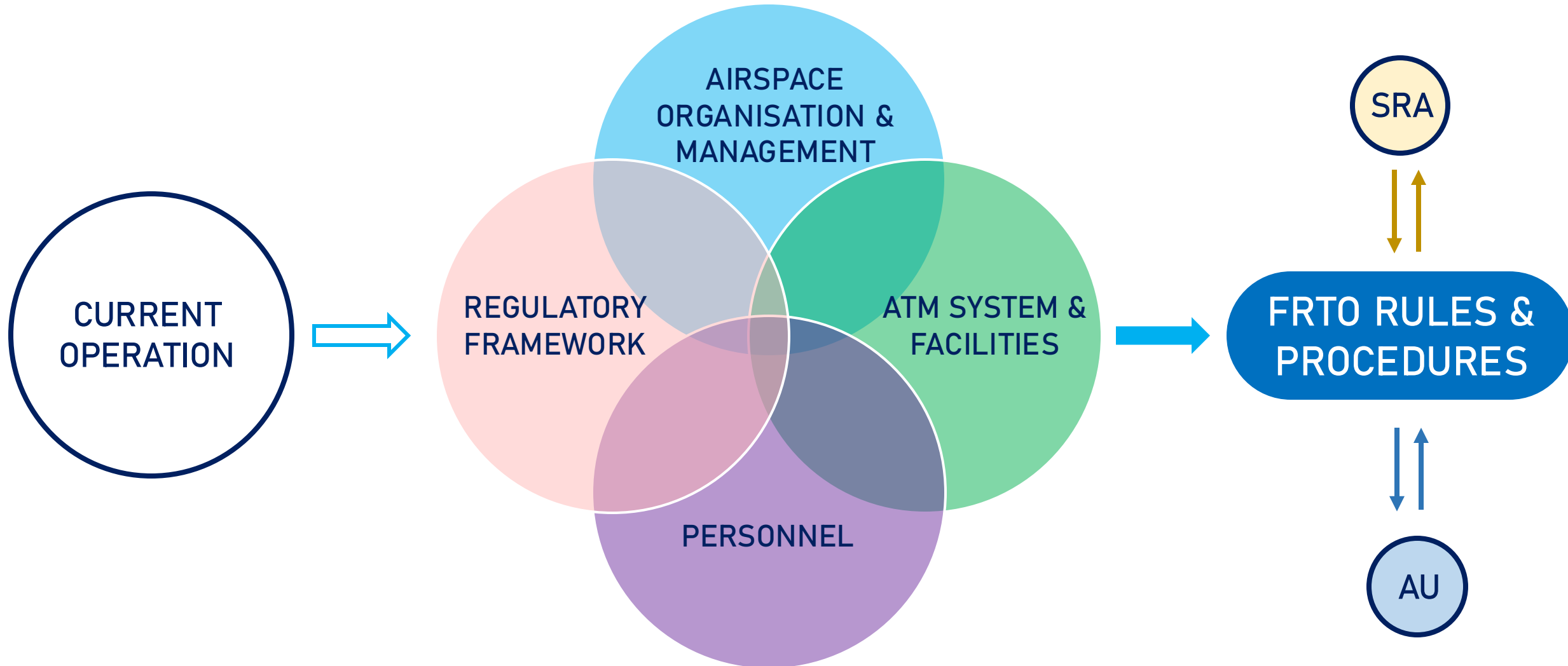
REGULATION FRAMEWORK

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
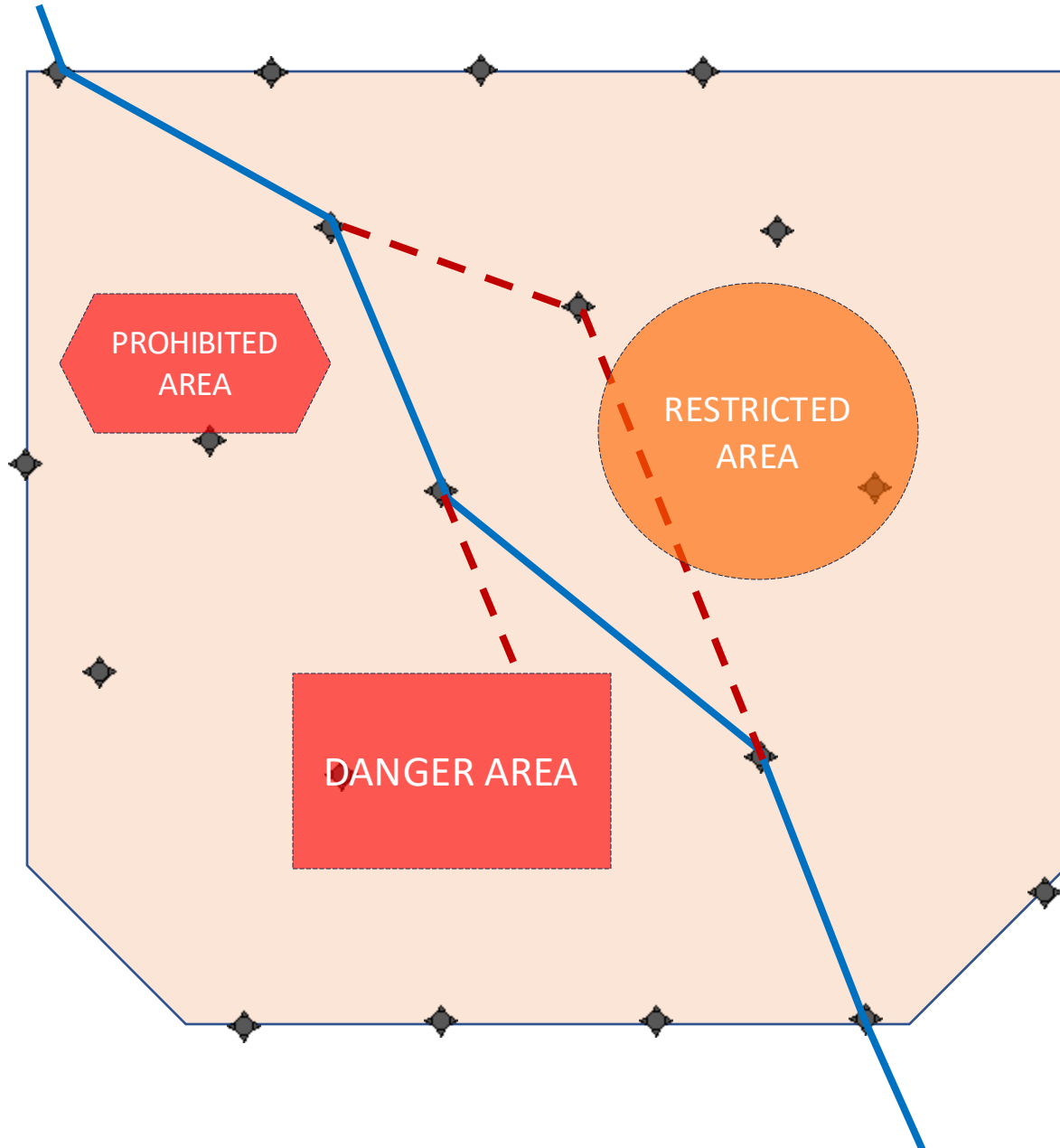- PBN Separation on MOS 170

LOCA
- FRTO's flight plan information between FPLC to ATC.
- Clauses to transfer at any point in the boundary as agreed by each other.

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# Airspace Organization & Management

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

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VERTICAL & HORIZONTAL LIMIT

FL600

UPR AREA

FL330

Procedural

Procedural
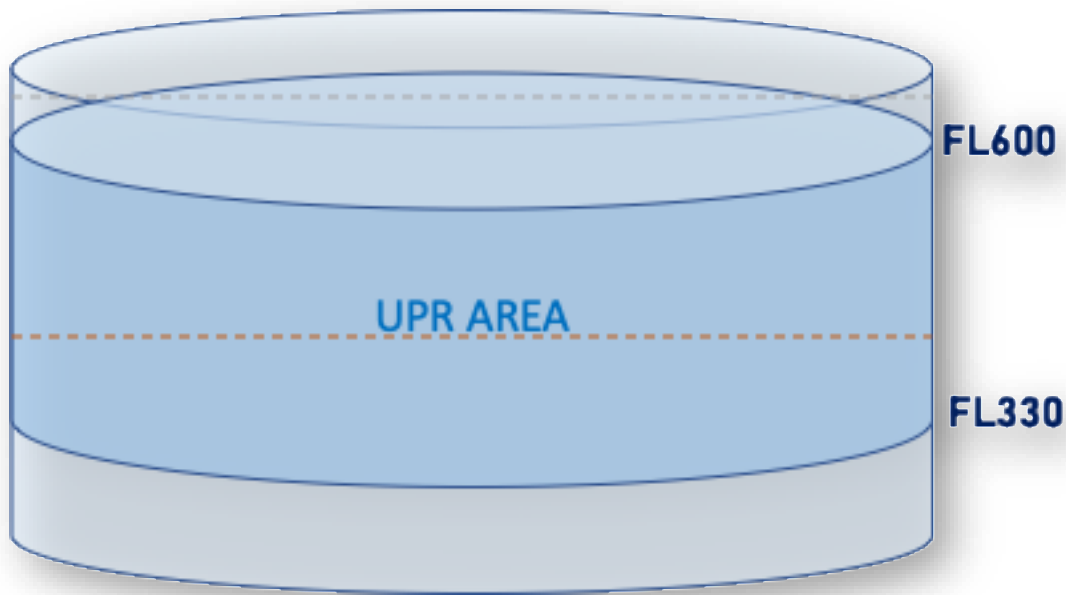
Indonesia FRTO implementation

- 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

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ATM System & Facilities

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
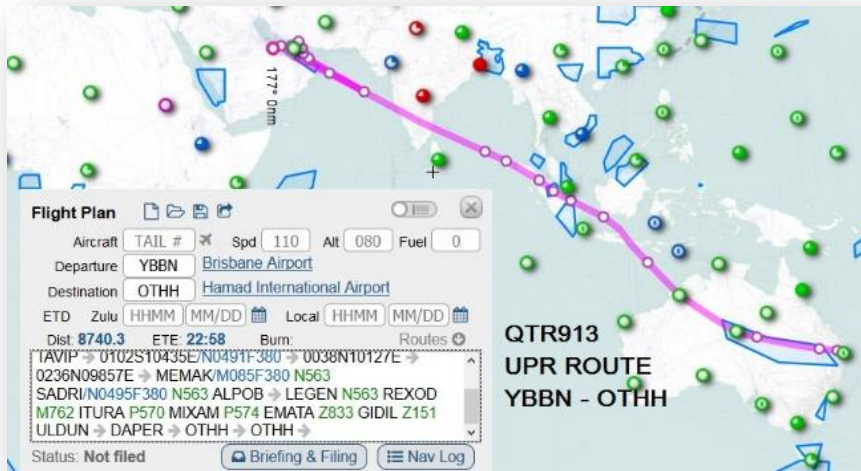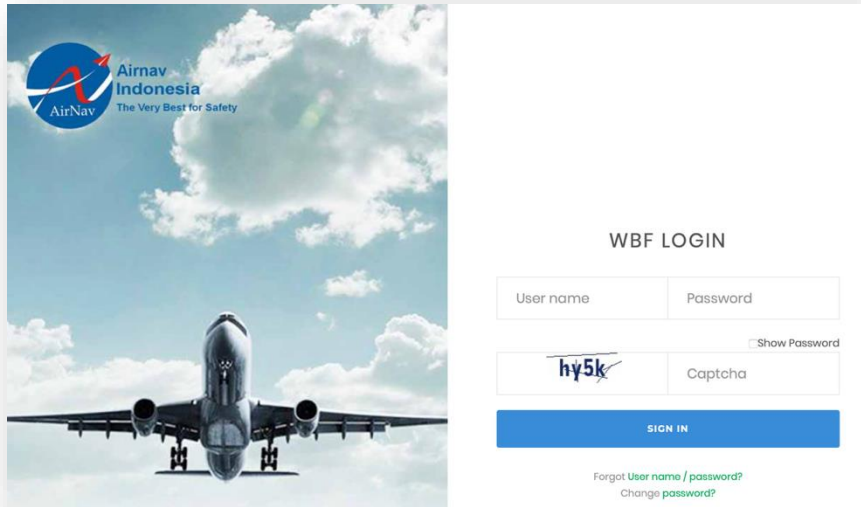
- WEB-BASED FLIGHT PLAN

ATM AUTOMATION SYSTEM

- JKT ACC: COMSOFT
- UPG ACC: THALES TOPSKY

AERONAUTICAL CHART

- NAVEARTH
- SKYVECTOR

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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.

ATC AUTOMATION SYSTEM
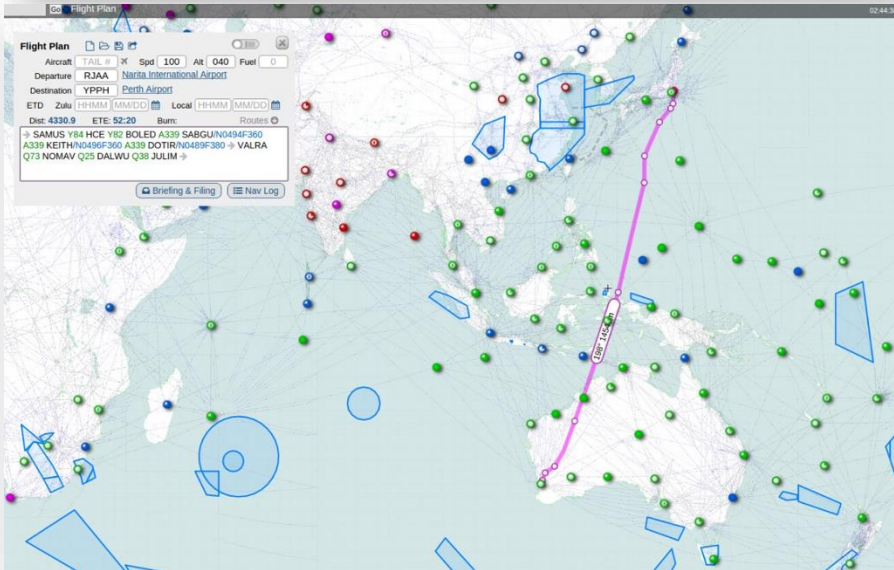
Ensure that the ATCAS supports flexible routing, including the following capabilities:

- 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 Function/Warning (FPCF/W)
  - 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
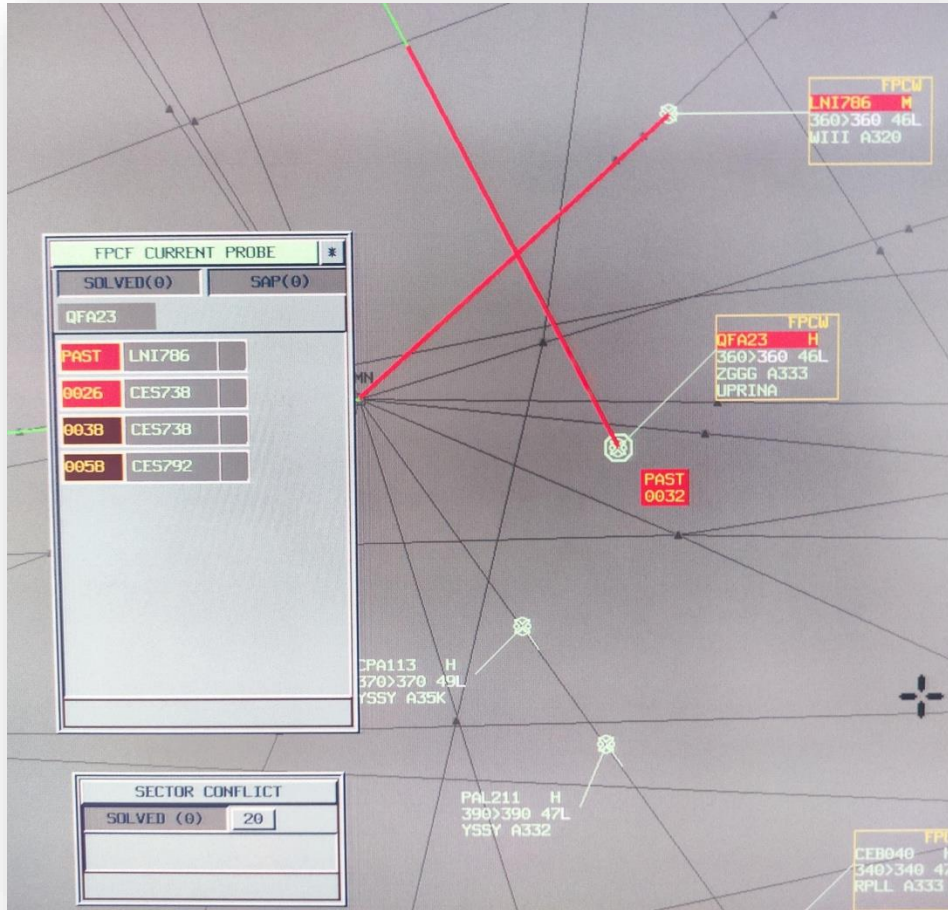
FPCF

TOP   RAM
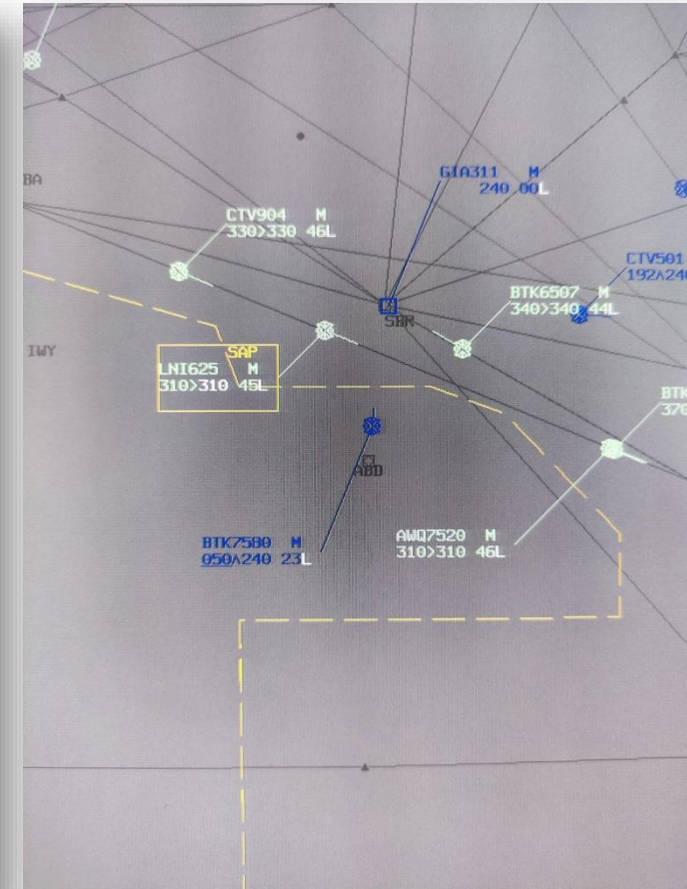
DAIW

Personnel

PERSONNEL

- Involved 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/FRTO (online)
  - PBN refreshment training
  - Local training for procedures
  - ATC Simulation
  - Performance check
- Establish communication with ATC association.
- ATC Feedback.

IMPLEMENTATION

FRTO IMPELEMENTATION TIMELINES

Timeline:

- **JUN 2020** — *UPR Trial Operation*
- **MAR 2023** — FRTO OAK cross-border
- **5 OCT 2023** — UPR/FRTO full Implementation
- **23 OCT 2023** — APAC LOI FRTO
- **MAR 2024** — DRO SIN cross-border trial ops
- **JUN 2024** — FRTO PNG-UPG cross-border
- **AUG 2024** — FRTO AUS cross-border trial

WITHIN JKT & UPG FIR

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

CROSS FIR BOUNDARY UPR

- On Trial based on LOU between ANSPs & Airlines

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USAGE & BENEFIT

USAGE & BENEFIT

YEAR	Number of Flights	Carbon Emission Reduction (CO_2)	Remarks
2020	68 flights	64 Tons	-
2021	-	-	Peak of Pandemic
2022	128 flights	120 tons	-
2023	1130 flights	1067 tons	*Including hajj flights*
2024*	1475 flights	1374 tons	*Including hajj flights*

* until July 2024

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TAKEAWAYS 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.

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