الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY

United Arab Emirates

Enhancing Traffic Flow Over the High Seas (Indian Ocean)

Special Air Traffic Management (ATM) Coordination Meeting and MID Region ATM Contingency Framework Workshop
(Muscat, Oman, 1 – 5 February 2026)

Contents

- Scope & Approach (Interface-based)
- Interface View of the Network (High Seas as a Connector)
- Traffic Flow Sample
- Airspace Users' Feedback
- Global Oceanic Best Practice

Scope & Approach

- Focus: High Seas and the MID Region interface with APAC (Indian Ocean flows)
- Method → Evidence + Operational Feedback + Best Practice Comparison
- No attribution, interfaces & system performance, not State-specific

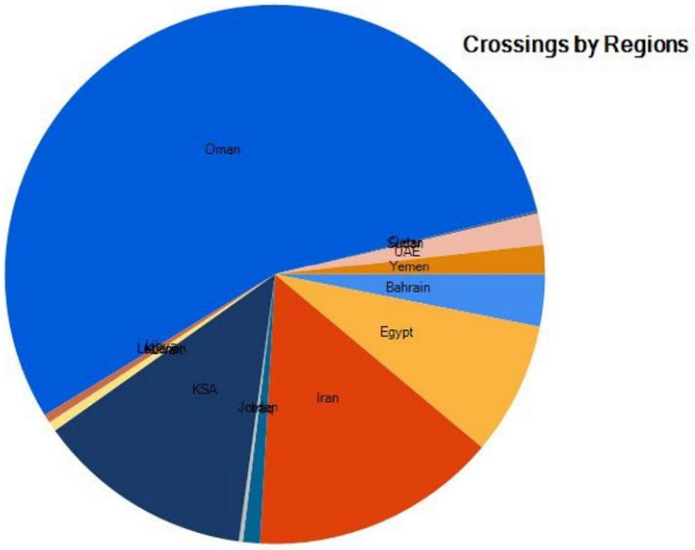
High Level view of the Network

- MID acts as a bridge between major international traffic flows
- High seas environment amplifies coordination and comms dependencies
- Small interface frictions can propagate across regions

Evidence from MIDRMA Safety Monitoring Report[1]

- One of the major findings from the report: **"e. Persistent coordination challenges at Muscat–Mumbai FIR boundary and Sana'a FIR interfaces require dedicated technical meetings."**
- Recommendation: **"c. Enhance Regional Coordination: Face-to-face technical meetings are recommended to resolve outstanding safety protocol issues."**

Top 20 Busiest Segments in the MID Region (RVSM only)			
Rank	**Segment**	**Frequency**	**FIR**
11	RASKI-MENSA	3507	Muscat
14	TONVO-RASKI	2693	Muscat
16	RASKI-PASOV	2351	Muscat
18	PARAR-MENSA	2180	Muscat
19	TONVO-PARAR	2164	Muscat

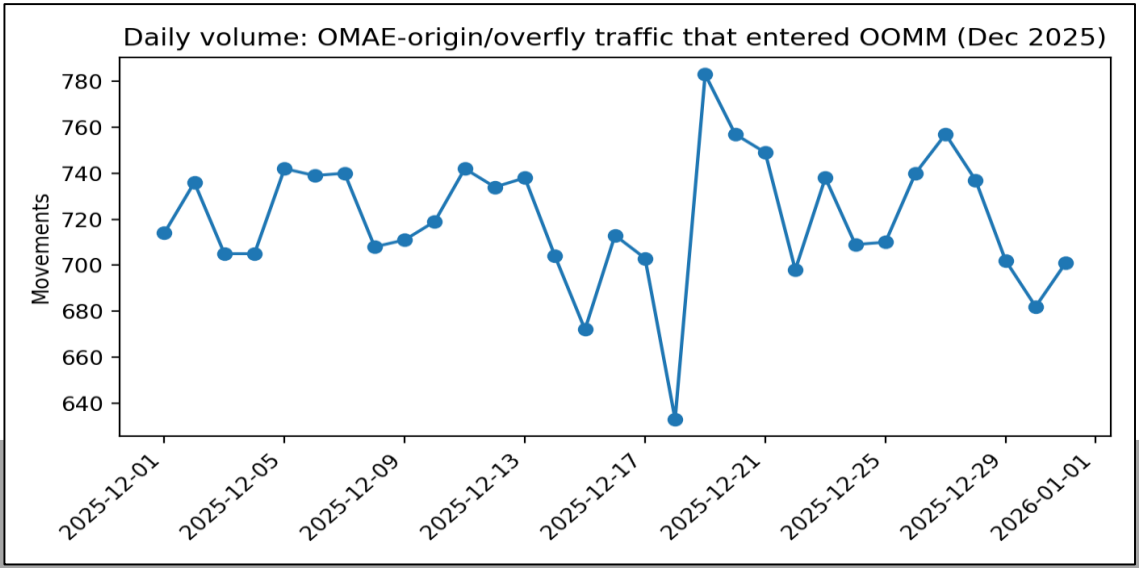


[1] https://www.icao.int/sites/default/files/MID/MeetingDocs/2026/MIDRMA%20Board21%20Meeting/2-%20Documentation/WP08.pdf

Traffic Flow Towards the East (December 2025)

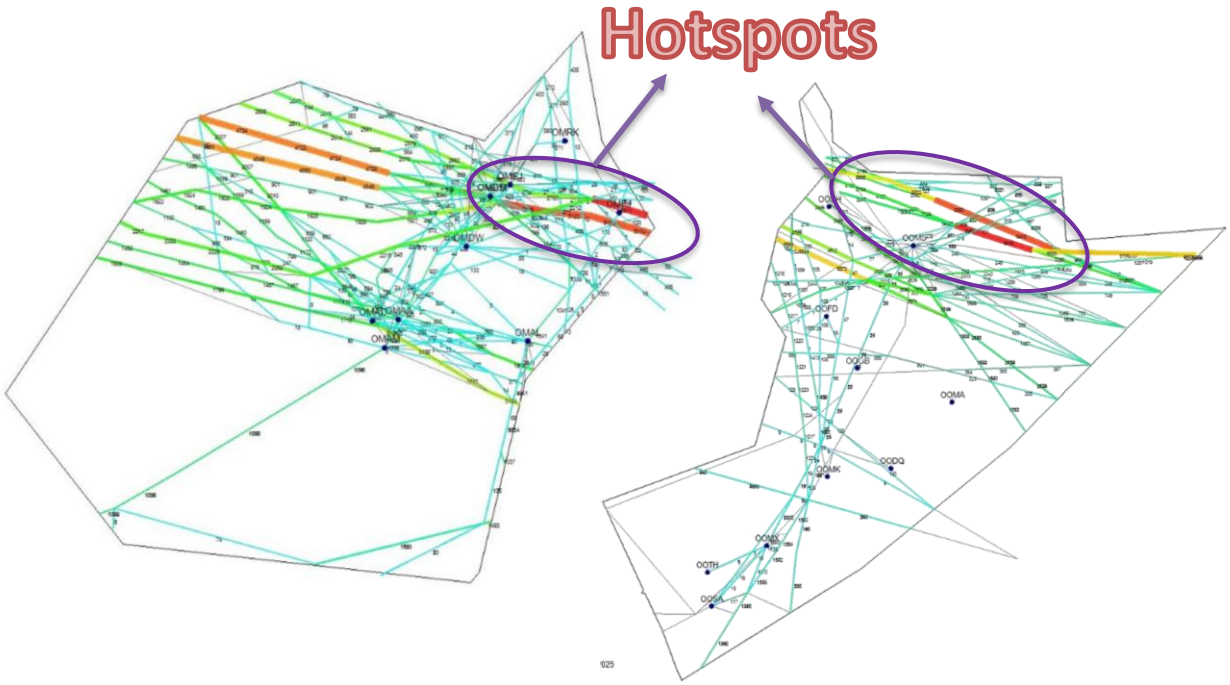
- Traffic is continuous throughout the month/year
- Daily movements show steady, repeated interface workload

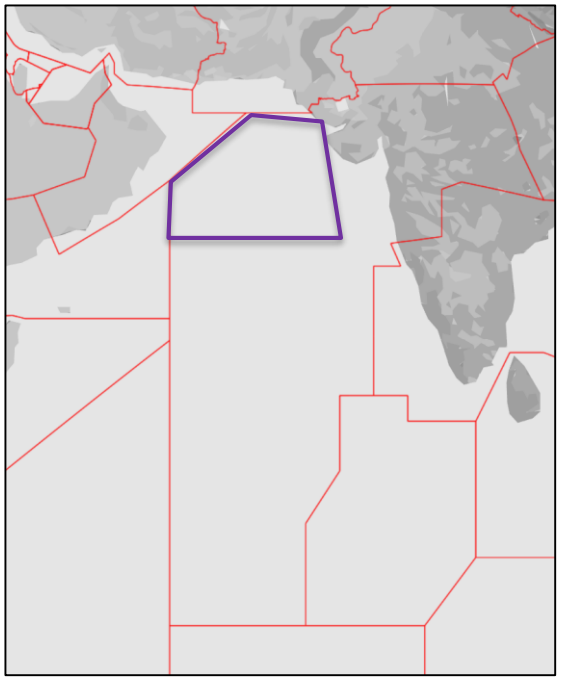
Data Analysis	
Total Movements passed through OMAE	22,321
Landed within OOMM	1,876 (8.4%)
Overflights/exiting OOMM	20,445 (91.6%)



Convergence Points

- Where interface management becomes real!

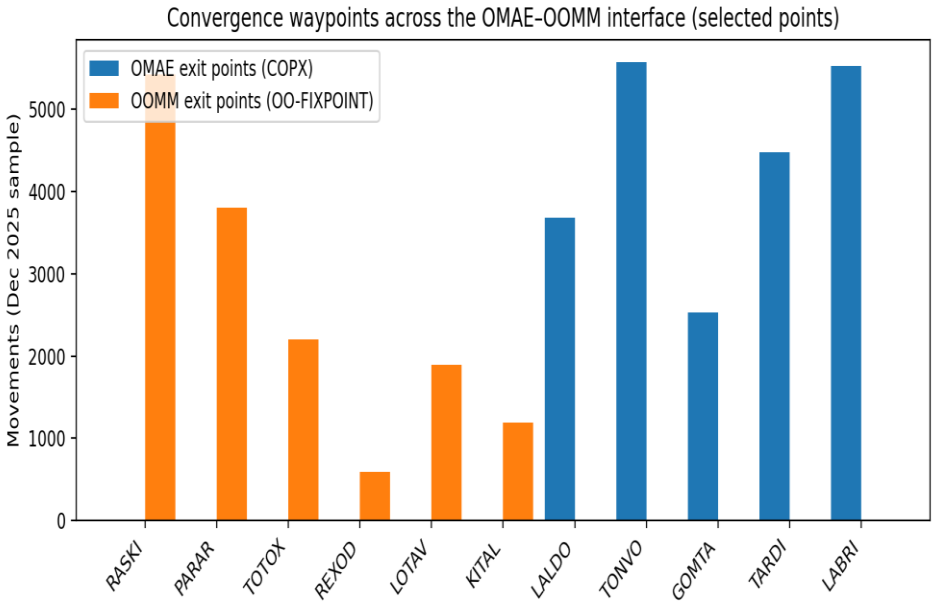


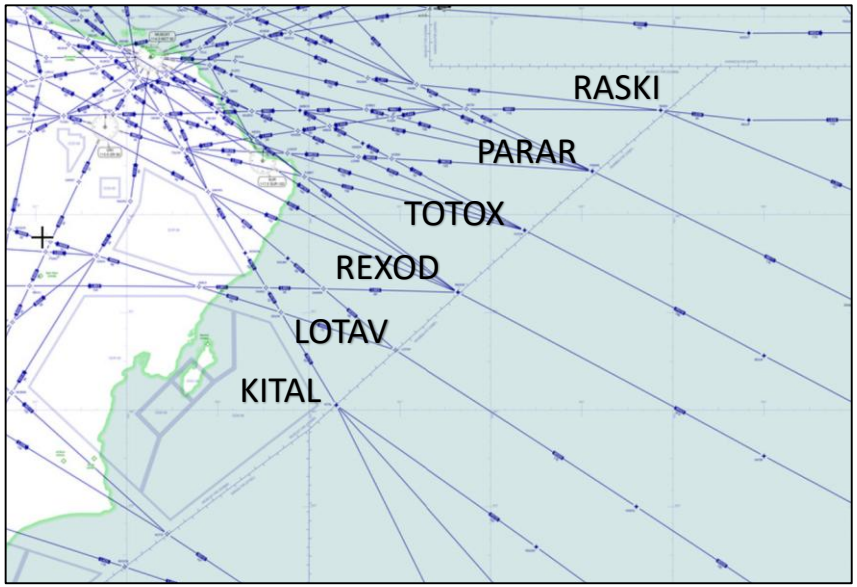


Convergence Points

- Selected waypoints:
  - OOMM FIR → RASKI, PARAR, TOTOX, REXOD, LOTAV, KITAL
  - OMAE FIR → LALDO, TONVO, GOMTA, TARDI, LABRI
- These points concentrates flows & become natural “stress points” especially under wx, and disruptions
- Use case: structured routing, balance sharing, pre-agreement

Pain Points at the Interface

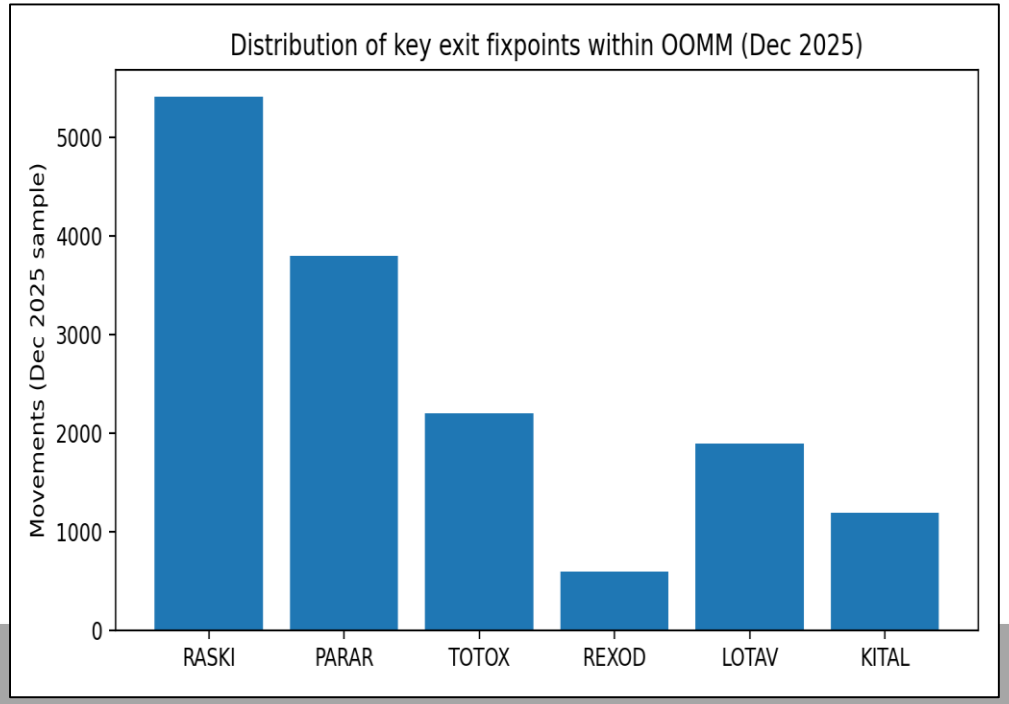




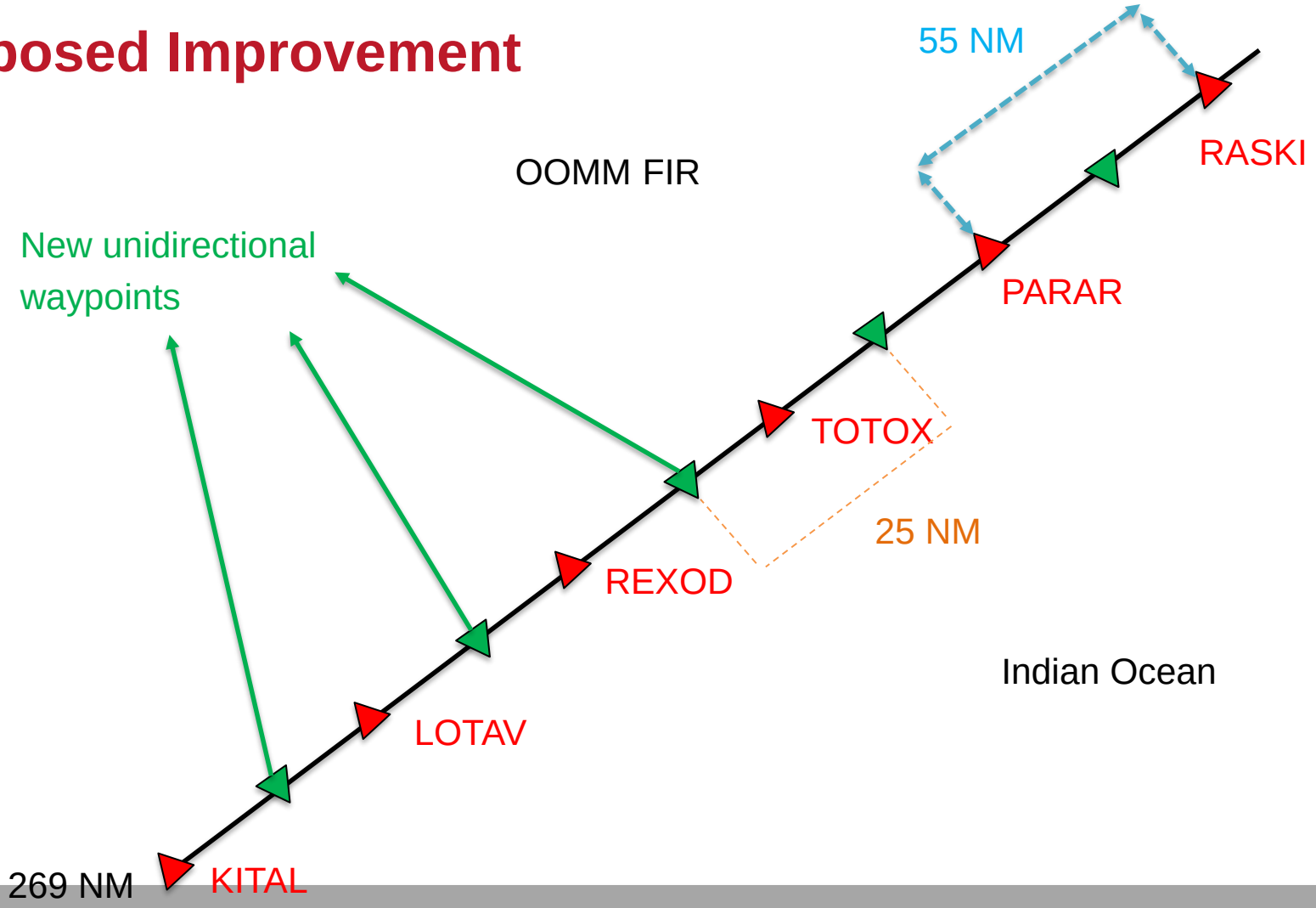
Interface Point	RASKI	PARAR	TOTOX	REXOD	LOTAV	KITAL
Count	5420	3799	2204	597	1891	1194
Percentage	24%	17%	10%	3%	8%	5%

The Oceanic Distribution

- Dec 2025 shows RASKI PARAR TOTOX LOTAV KITAL dominance
- Implications → Structured enhancements along these points can deliver outsized benefits
- Focus → improvements on predictability, workload reduction, safer wx management



Proposed Improvement



Airspace Users' Feedback

Flow Restrictions

- FL allocations
- In-trail spacing
- Constraint at FIR boundaries
- Tactical flow adjustments

Weather Deviations

- Pilot own deviation
- Limited lateral/vertical avoidance
- Deviation requests overlapping structured flow
- Multiple bi-directional flows

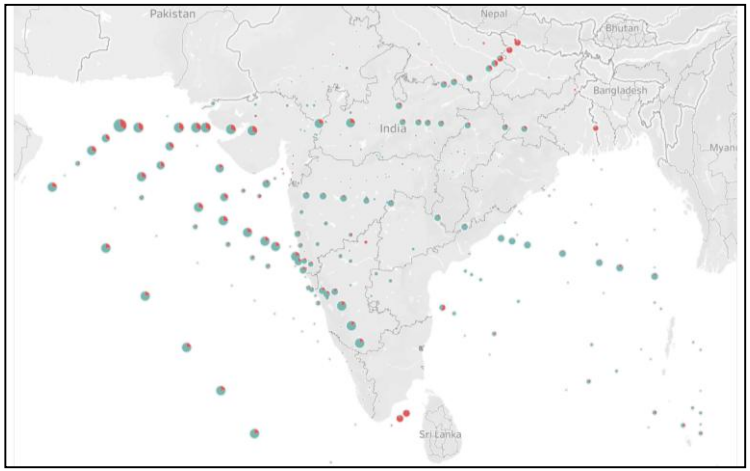
Comms

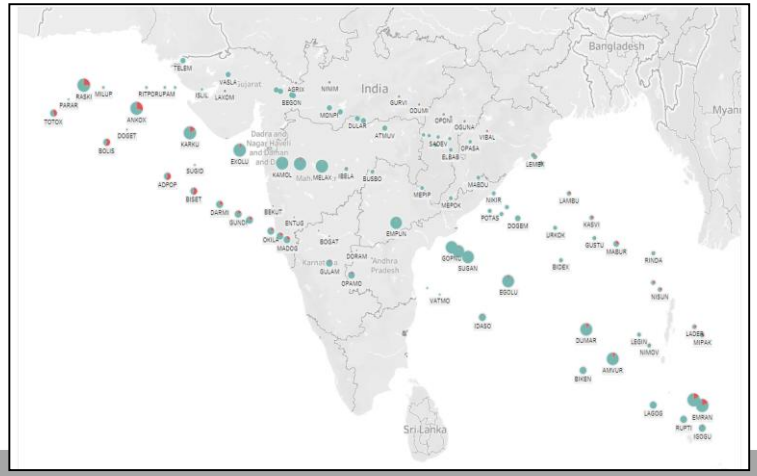
- Mixed comms environment HF/VHF/CPDLC
- CPLDC response
- Timely acknowledgement

Coordination

- Loss of separation
- TCAS RA
- Frequency congestion
- Upstream vs downstream alignment

A Closer Look into FL Allocation





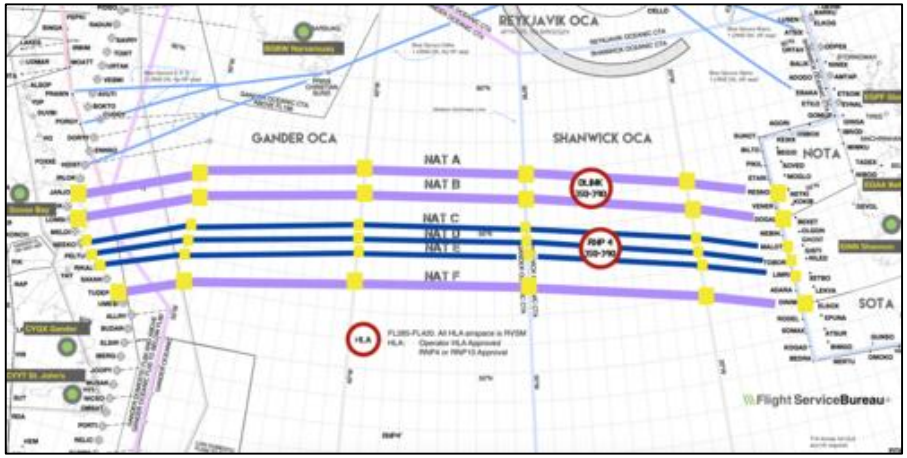
Planned FL or higher

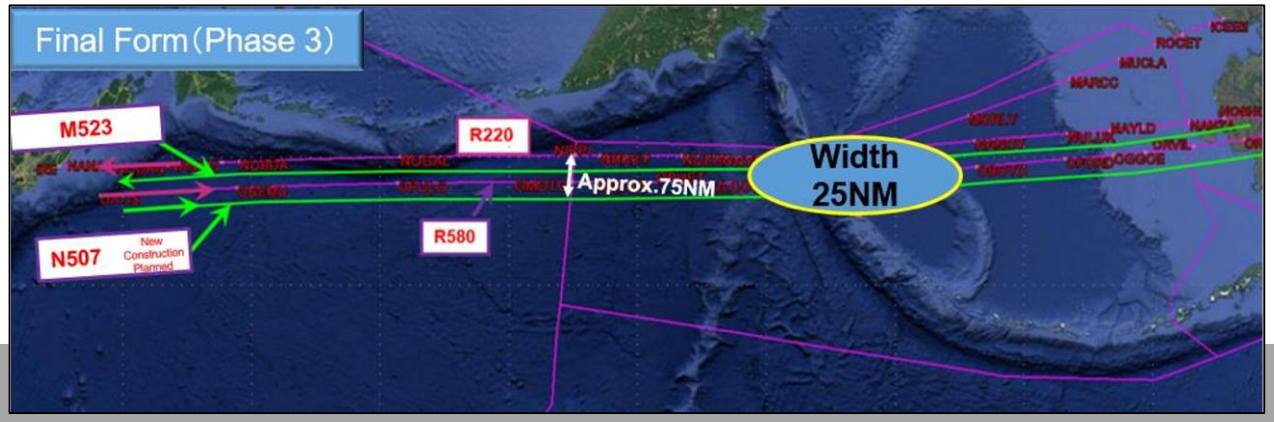
Below planned FL

Circle size indicates waypoints usage

Global Oceanic Best Practice

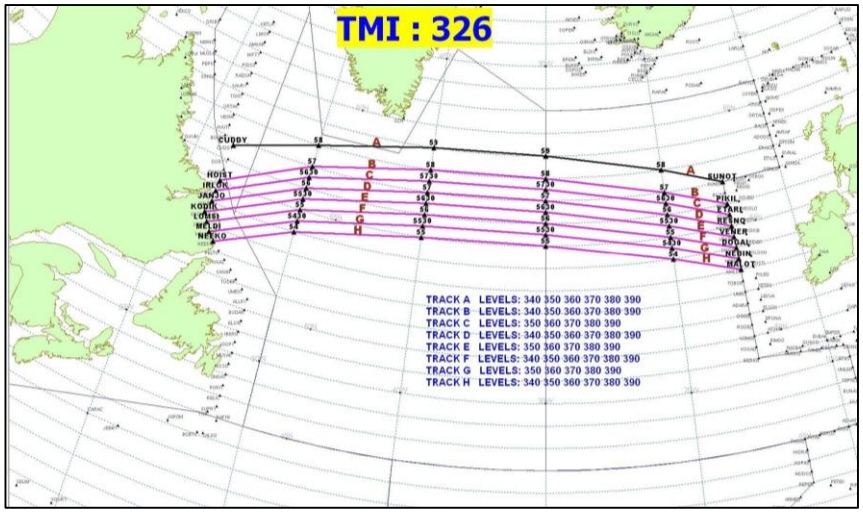
- What works over the Atlantic & Pacific, and what can we adapt for the Indian Ocean?



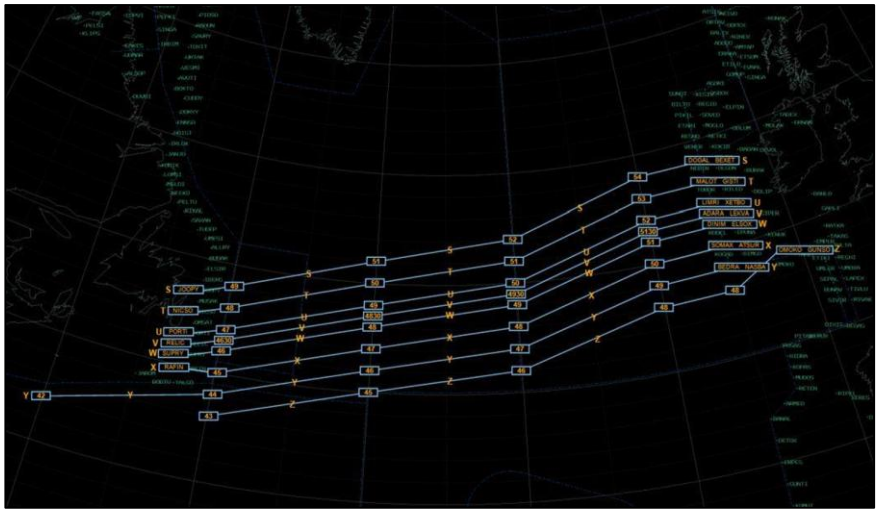


Atlantic Ocean[2]

- Structured daily planning, and publication of constraints
- Cross-ANSP mechanisms for flow management and reroute options
- Strong airline engagement and performance monitoring



Day-time Westbound

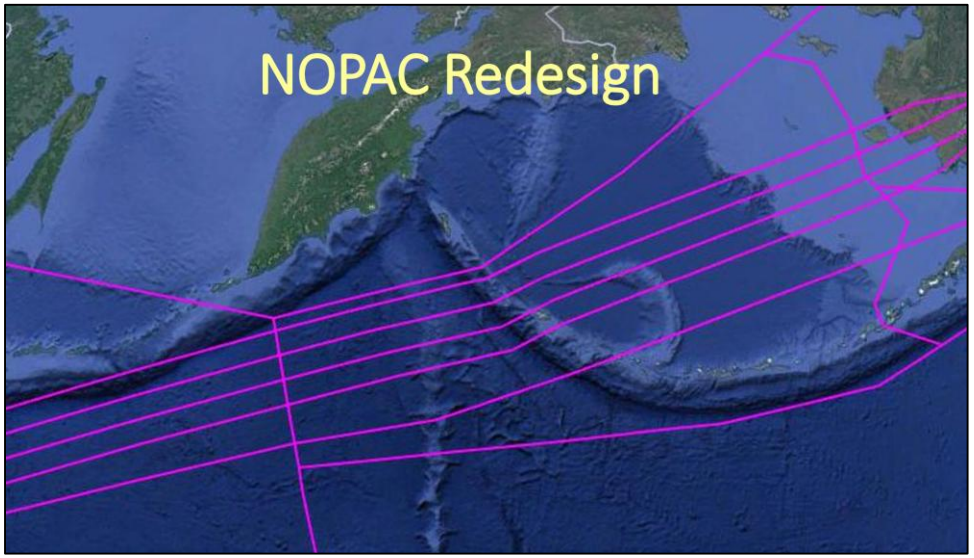


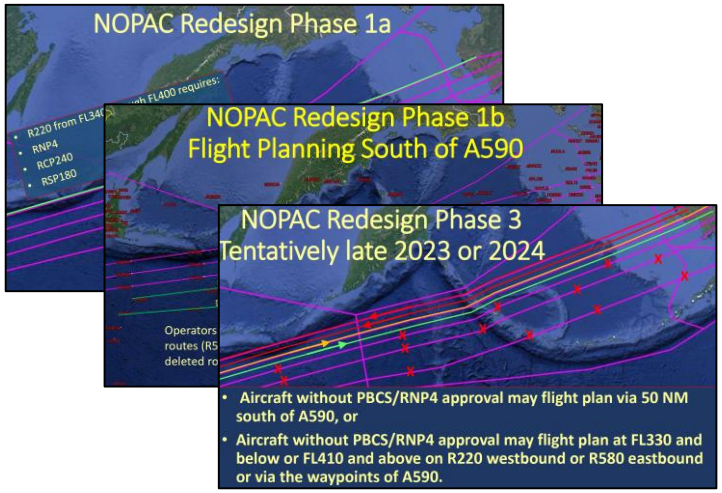
Night-time Eastbound

[2] https://www.icao.int/sites/default/files/EURNAT/Documents/EUR%20and%20Nat%20Docs/NAT%20Documents/NAT%20Documents/NAT%20Doc%20007/NAT-Doc-007-EN-Edition-V.2026-1-Amd-0.pdf

Pacific Ocean[3]

- North Pacific (NOPAC) redesign is structured multi-phased project
- Major flow between Alaska & Japan
- Brought capacity and efficiency gains through reduced separation standards
- Key lesson → Cooperative planning, multi-phased approach, data link connectivity requirements.





[3] https://www.faa.gov/media/96856

Alignment along MID APAC Interface

- Need for a comprehensive cross-regional airspace optimization strategy (road map)
- Main drivers:
  - Exponential traffic growth
  - Constraints at FIR boundaries
  - Inconsistencies in separation standards
- Call to action → Harmonize interface structures, enable data-driven ATFM, work towards practices such as TBO, DRO, FRA, and assign investments for Data Links & connectivity
- Joint cross-regional taskforces & active data sharing

Action by the Meeting

a) note the increasing traffic concentration and operational complexity at the interfaces between the MID and APAC Regions with focus on the Indian Ocean interface.

b) request a focused analysis of traffic flows and interface hotspots associated with high-seas operations, in coordination with concerned States, ANSPs, and RMAs

c) encourage the strengthening of cross-boundary coordination and information exchange at identified high-seas interfaces.

d) establishment of a joint MID–APAC task force, involving concerned States and ANSPs, to examine traffic flows, interface hotspots, and coordination aspects related to high-seas operations

e) the joint task force to report its outcomes and recommendations to the relevant PIRGs for further consideration and appropriate action.

Q&A

Thank You