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ECAA
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ICAO

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From ATM Concepts to Operational Implementation

Implementing Flexible Use of Airspace (FUA) Through Integrated ASM, ATFM, and Route Availability Management

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The Strategic Vision: Transitioning to ATM

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Collaborative Planning

Moving from "First-Come, First-Served" to a shared, proactive planning environment involving all stakeholders.

Dynamic Routes Management

Transitioning from static route structures to flexible, optimized trajectories based on real-time data.

ICAO GANP Alignment

Ensuring regional operations are fully compliant with the Global Air Navigation Plan and ASBU modules.

Active Management

Shifting from passive monitoring to active management of airspace capacity and traffic flow.

The transition to ATM is a shift from passive service to active, data-driven management of the regional sky.

The Role of NASMC

- NASMC acts as the national Airspace Management (ASM) authority.
- Core mandate is coordinating multiple stakeholders:
  - Military Airspace Users
  - Civil Airspace Users
  - Air Navigation Service Provider (NANSC)
  - ATFM Stakeholders

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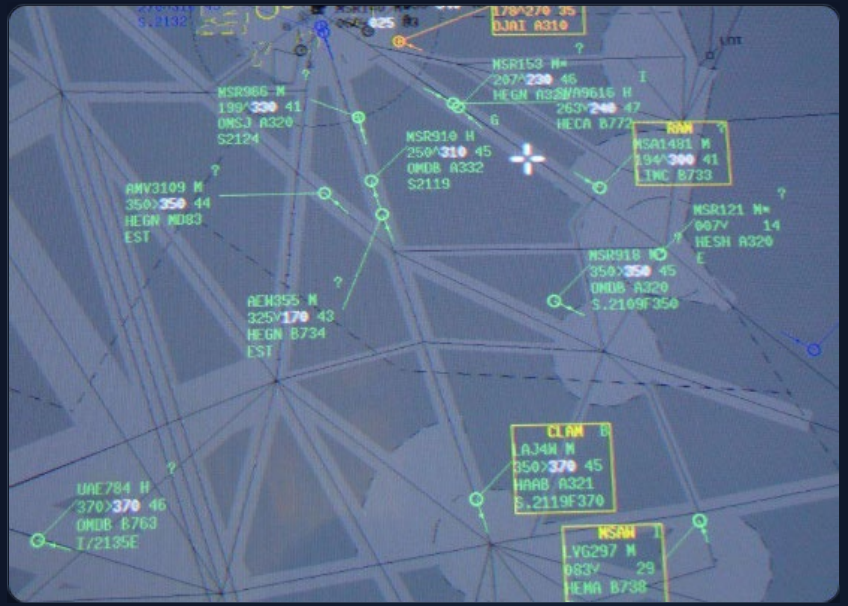
NASMC Tools Implementing FUA

Current Operational Capabilities

NASMC Tools Implementing FUA

To enable the Flexible Use of Airspace (FUA), NASMC deploys a suite of integrated operational enablers designed for real-time synchronization:

- NASMC ASM Platform: Core operational base.
- Airspace Use Plans (AUP): Strategic daily allocations.
- Updated Airspace Use Plans (UUP): Tactical intra-day adjustments.
- ATFM Support Integrations: Balancing capacity and demand.
- Conditional Routes Availability Message (CRAM): Dynamic route opening and closure announcements.



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The Remaining Challenge

Information Availability vs. Information Usability

The Challenge: Fragmented Information Sources

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- AIP
- NOTAM
- AUP / UUP
- Phone Coordination
- Email Updates
- Paper Charts

Manual Synthesis

High Workload
Time-consuming manual search and verification.

Human Error Risk
Potential to miss active restrictions or updates.

Route Rejection
Uncertainty in route acceptance by ANSPs.

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Route Availability Platform (RAD)

Bridging the Gap

RAD Database Structure

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Data Element	Operational Description	Impact on Routing
Entry / Exit Points	Specific navigational fixes bounding the restriction.	Defines exact geographic scope.
Route Segment	The specific ATS route identifier.	Targets the precise pathway affected.
Flight Level	Vertical boundaries (Upper and Lower FL).	Allows under/over-flying military areas.
Time Window	Start and End times in strict UTC.	Enables dynamic temporal availability.
Availability Status	Open, Closed, or Conditional.	Directly dictates flight plan validity.

Dynamic Route Availability

- Route status in the RAD fluctuates dynamically based on real-world triggers:
  - Real-time military area activity and live activations
  - Fluctuating sector capacity limits and staffing
  - Publication of new AUPs or tactical UUPs
  - Implementation of urgent weather/ATFM regulations

Why RAD Alone is Not Enough

Static RAD Database (Excel / Internal DB)

Designed for Experts, Not Users

RAD data is often structured for airspace designers, making it difficult for dispatchers to interpret quickly during flight planning.

Manual Interpretation Required

Dispatchers must manually cross-reference static rules with dynamic NOTAMs and AUPs, increasing the risk of errors.

Limited Operational Impact

Information that is not easily accessible or actionable remains "dead data" with minimal influence on daily network efficiency.

A RAD database without a user-facing interface is a source of truth that remains operationally silent.

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Dispatcher Application

The Airspace User Interface

The Dispatcher Application

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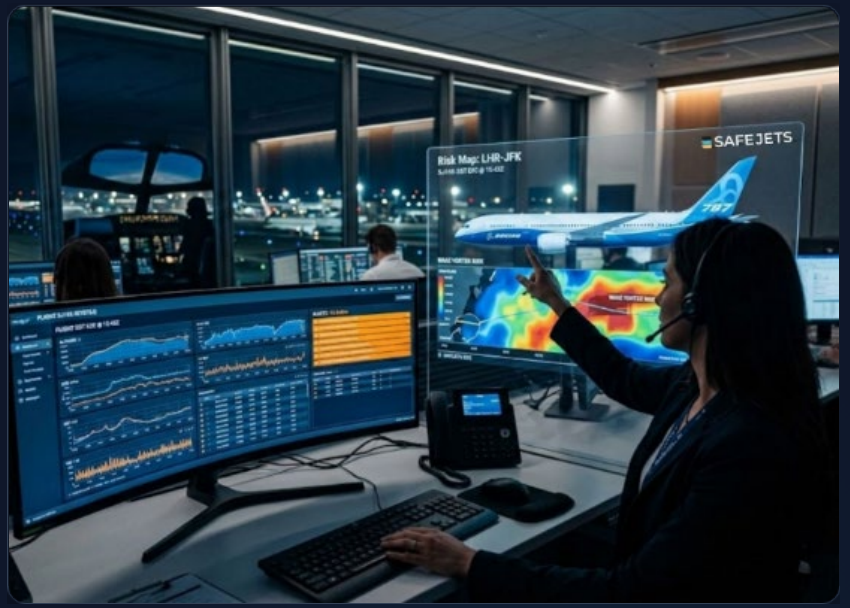
Operational Decision Support

A RAD database without a user-facing interface remains operationally silent. The Dispatcher App bridges this final gap.

- Actionable Intelligence: Transforms static route restrictions into executable flight planning decisions.
- Automated Route Search: Eliminates manual synthesis of NOTAMs and static databases.
- Direct Recommendations: Suggests optimal, valid routes rather than just publishing restrictions.
- Real-time Awareness: Integrates dynamic ASM data for immediate capacity awareness.



From Static RAD to Operational Decision Support

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Function	Traditional RAD	Dispatcher App
Route Publication	✓	✓
Restriction Publication	✓	✓
Automated Route Search	– Limited	✓ Automated
Route Recommendation	✗ No	✓ Yes
Dynamic ASM Integration	– Limited	✓ Real-time
Capacity Awareness	✗ No	✓ Yes

The Dispatcher App transforms static route restrictions into actionable flight planning decisions.

NASMC **CONTINGENCY OPERATIONS**

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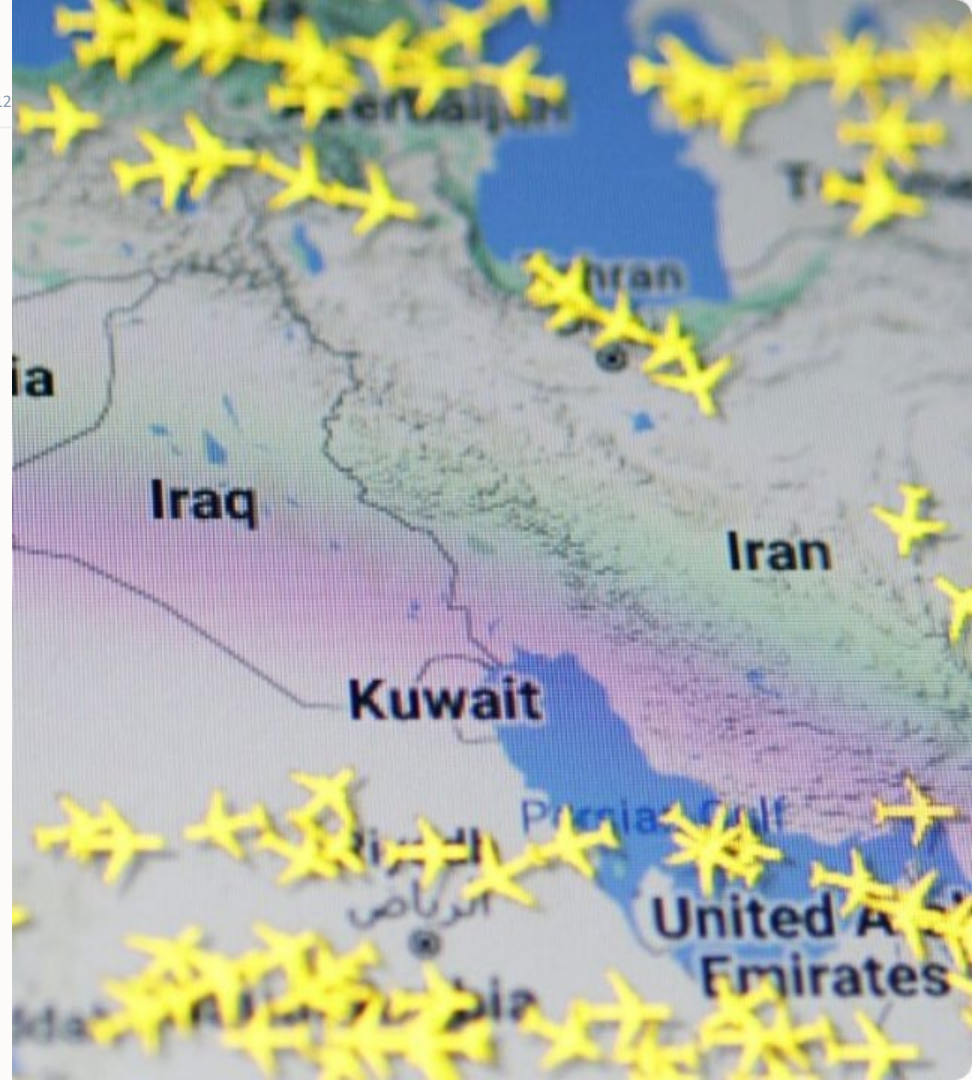
Dynamic Airspace Management

Using tactical RAD restrictions to maintain safety and capacity during geopolitical events in the Middle East

DYNAMIC RAD CONCEPT

By transforming route restrictions from static publications into agile tactical tools, the Egypt RAD Platform allows airspace managers to:

- Enable or Disable: Routes dynamically based on real-time safe status.
- Temporal Windows: Define precise activation timelines for specific airspace corridors.
- Reroute recommendation: Offer alternative routes directly into automated dispatch interfaces.



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MID REGION CONTINGENCY ENVIRONMENT

The Volatile Reality

The Middle East airspace is highly sensitive, facing rapid geopolitical adjustments, sudden route closures, and large-scale, unpredictable tactical diversions.

Managing traffic is no longer about predictable seasonal schedules; it requires handling extreme shifts in route demand.

Overcoming Static Structures

When neighboring Flight Information Regions (FIRs) alter routing availability, static Route Availability Documents (RAD) quickly become obsolete.

Airspace management must shift from static monthly publication periods to hours-level tactical execution.

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MAPPING CONCEPTS TO SERVICES

ICAO ATM Concept	NASMC Operational Platform	Egypt's Node Implementation Value
Flexible Use of Airspace (FUA)	ASM Platform	Civil-military coordination, dynamic TSA/TRA allocation.
ATFM & Collaborative Decision Making	**Daily Plan Publisher & Dispatcher**	**Shared constraints, forecast transparency, direct dispatcher interfaces.**
Information Management	AFTN Validation Service	Zero-syntax errors, guaranteed message processing efficiency.
TBO Foundation / FF-ICE	**RAD Platform & Route Engine**	**Tactically managed route restrictions for contingent flight plans.**

Conclusion

NASMC has implemented the core tools for FUA. The Route Availability Platform and Dispatcher App complete the vision by transforming raw ATM data into actionable decisions for airspace users.

Thank You