SANS
خدمات الملاحة الجوية السعودية
Saudi Air Navigation Services

GACA®
الهيئة العامة للطيران المدني
General Authority of Civil Aviation

MANAGING SKIES
SECURING LIVES

Implementation of
Free Route Airspace (FRA)
ICAO-MID

BEYOND

References:

ICAO Global Air Navigation Plan (GANP), Doc 9750-AN/963 Fifth Edition – 2016

ICAO Doc 4444

ICAO Annex 15

ICAO Doc 10066

EUROCONTOL, Free Route Airspace developments - for a route-free European (December 2016)

1. INTRODUCTOIN TO FREE ROUTE AIRSPACE

OBJECTIVES

- Modernization of the airspace, consistent with the ICAO ASBU module B1-FRTO (improved operation through optimized ATS routing), specified in the Global Air Navigation Plan (GANP)
- Flight Efficiency
- Reduce controller workload
- Increase capacity
- Reduce CO2 emission

2. Discussion

2.1 FRA CONCEPT DESIGN

Definition :

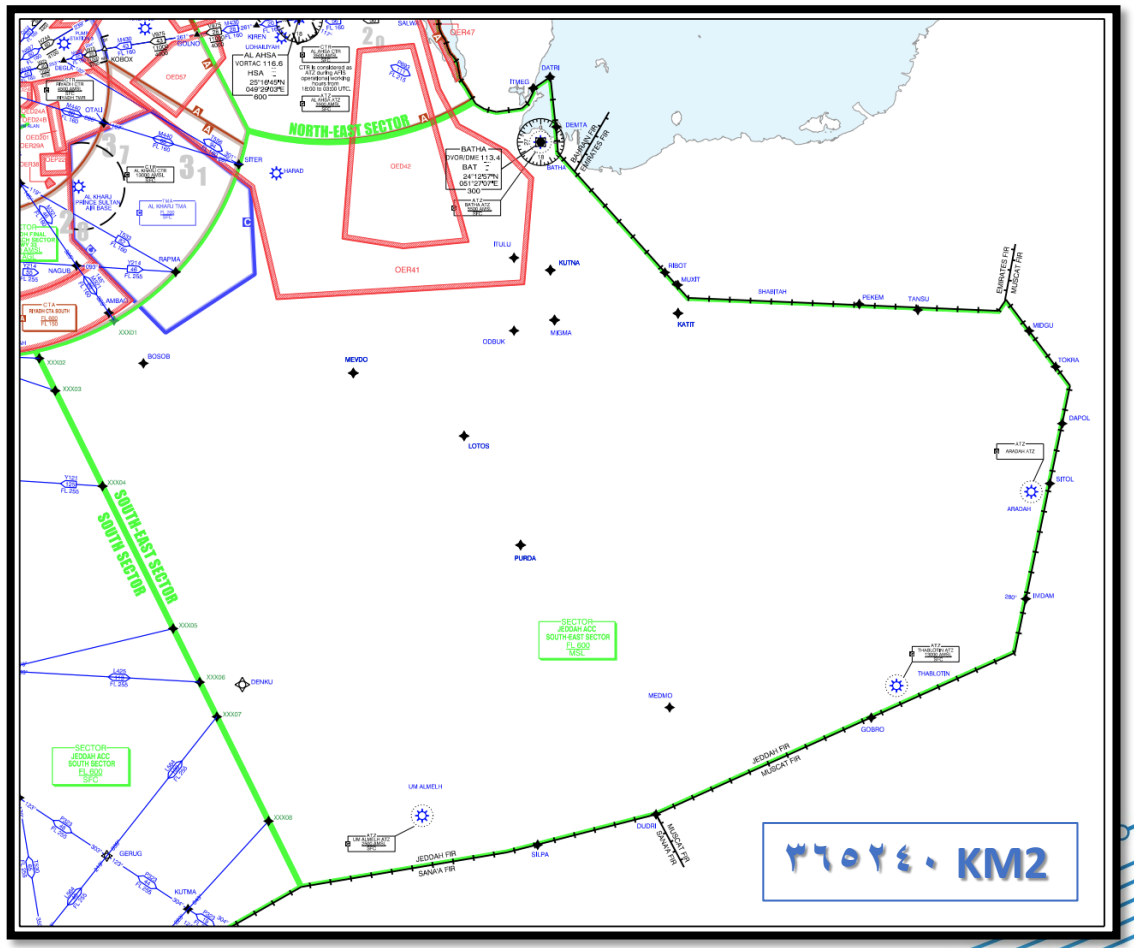
A specified airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) way points, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control.

Scope:

- Meet the Safety Objectives;
- Be compatible with existing operations;
- Be sustainable through further development;
- Be capable of expansion/connectivity to/with adjacent airspace

3. IMPLEMENTATION OF FRA
3.1 General

- Effective from 18th April 2024,the South-East of Jeddah FIR, FL300 and above, is designated FRA
- The FRA procedures are published in the KSA AIP, ENR 2.2.4 and ENR 6-23.
- The ATS route network remains applicable FL290 and below.
- Implementation of FRA was based on the existing CNS/ATM infrastructure
  - NAV : RNAV 5
  - COM: VHF
  - SUR : Radar
- No change to ATC separation

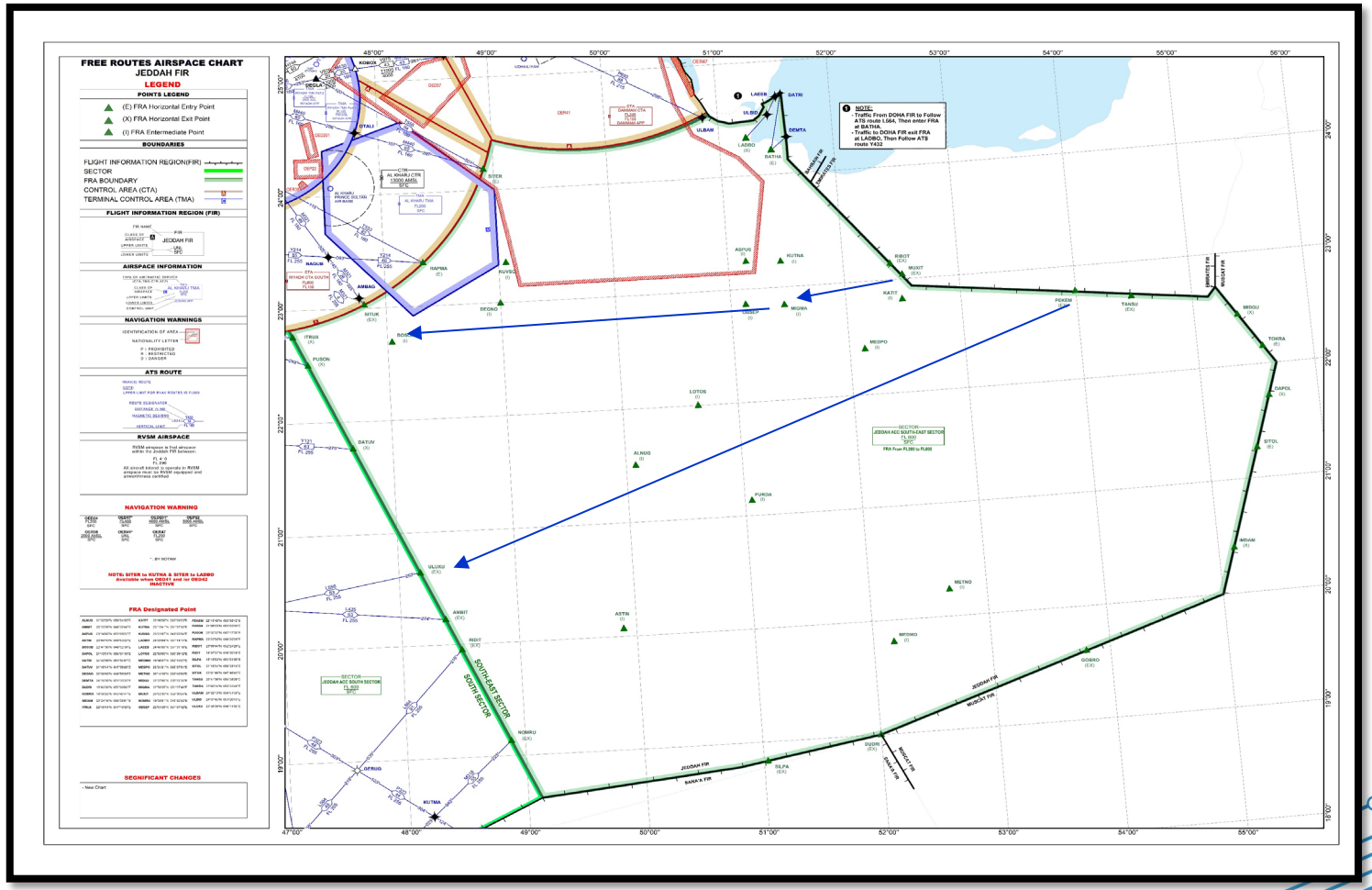


3. IMPLEMENTATION OF FRA
3.1 General

Aircraft may fly from ENTRY point DCT to EXIT point

OR

Aircraft may fly from ENTRY point, via an INTERMEDIATE point, DCT to EXIT point



3. IMPLEMENTATION OF FRA
3.1 eAIP Publications

2.2.4 Free Route Airspace General Procedures

2.2.4.1 Free Route Airspace (FRA) Concept Definition

FRA is a specified volume of airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) waypoints, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control.

FRA enables airspace users to fly as close as possible to what they consider the optimal trajectory without the constraints of a fixed route network structure.

2.2.4.2 Area of application

FRA procedures are applicable in the Jeddah ACC South-East Sector (ENR 2.1) of Jeddah FIR between FL300 and FL600. Please note that outside of the FRA, published ATS routes remain applicable.

2.2.4.3 Flight Procedures

2.2.4.3.1 General requirements

Navigation: RNAV 5

Communication: DCPC (Voice)

Route adherence: Fly directly between waypoints. Any deviation from the track between waypoints must be done with ATC clearance.

2.2.4.3.2 Contingency

In the event of Communication, Navigation or Surveillance failure, the aircraft must seek an alternative ATC clearance or follow the published contingency procedures.

2.2.4.3.3 Enroute frequency change methodology

a) VHF air-ground communication in the South-East sector is covered by different stations (ENR 6).

b) To maintain continuous direct communication between the controller and polit, the pilot must change frequencies along the route (refer to Table 1 of this section).

Sample phraseology: SVA783 on 132.9, FL360 DCT to XXX01.

c) The pilot must also maintain listening watch on the next frequency as the secondary, and/or any adjacent frequency as indicated in table 1.

2.2.4.3.4 Routing in FRA

a) The following standard routings (refer to Table 1) apply for traffic in the FRA.

b) FPL must include routes via adjoining ATS route before the Entry waypoint and after the Exit waypoint.

c) Segments between waypoints must be indicated by using "DCT" (direct) notation.

d) Waypoints along the enroute may be used to indicate speed and level changes.

Table 1

Entry point	Routing	Exit	Control Frequencies	Remarks
PEKEM	DCT MEDPO DCT	SITUK	134.5* 132.9**	@MEDPO change to 132.9
	DCT MEDPO DCT	ITRUX		

TANSU	DCT	ULUXU	134.5* 132.5**	@175NM after TANSU, change to 132.5
	DCT ASTIN DCT	NOMRU	133.35* 132.5**	@175NM after TANSU, change to 132.5
TOKRA	DCT MEDPO DCT BOSOB DCT	SITUK	134.5* 132.9**	@MEDPO change to 132.9
	DCT MEDPO DCT BOSOB DCT	ITRUX		
	DCT	DUDRI	134.5* 133.35** 132.5***	@80NM after TOKRA, change to 133.35 @85NM before DUDRI, change to 132.5
SITOL	DCT BOSOB DCT	SITUK	133.35* 132.9**	@200NM after SITOL, change to 132.9
	DCT	PUSON		
	DCT	DATUV	133.35* 132.9**	@200NM after SITOL, change to 132.9
GOBRO	DCT METNO DCT OBSEP DCT ASPUS DCT	LADBO	133.35* 132.9**	@110NM after METNO, change to 132.9 Exists FRA at LADBO, then follow ATS route T142.
	DCT PURDA DCT BOSOB DCT	SITUK	133.35* 132.5**	@100NM after GOBRO, change to 132.5 @60NM after PURDA, change to 132.9
	DCT PURDA DCT AL- NUG DCT	PUSON	132.9***	@100NM after GOBRO, change to 132.5 @ALNUG change to 132.9
	DCT	AMBIT	133.35* 132.5**	@150NM after GOBRO, change to 132.5
MUXIT	DCT MEDPO DCT	ULUXU	132.9* 132.5**	@120NM after MEDPO, change to 132.5
	DCT MEDPO DCT PURDA DCT ASTIN DCT	NOMRU	132.9* 132.5**	@70NM after MEDPO, change to 132.5
RIBOT	DCT MIGMA DCT	SITUK	132.9	NIL
	DCT MIGMA DCT	ITRUX		
SITER	DCT	LADBO	132.9	NIL Routing from SITER not available when OER41 & OER42 are active.
	DCT KUTNA DCT	RIBOT		
	DCT KUTNA DCT KATIT DCT	PEKEM	132.9* 134.5**	@KATIT change to 134.5
	DCT KUTNA DCT KATIT DCT	MIDGU		
RAPMA	DCT	LADBO	132.9	Exists FRA at LADBO, then follow ATS route T142
	DCT KUVSO DCT	RIBOT	132.9	NIL
	DCT KUVSO DCT KATIT DCT	PEKEM	132.9* 134.5**	@KATIT change to 134.5
	DCT KUVSO DCT KATIT DCT	MIDGU		
	DCT DEGNO DCT	DAPOL	132.9* 134.5**	@170NM after DEGNO, change to 134.5
	DCT DEGNO DCT LO- TOS DCT	IMDAM	132.9* 133.35**	@45NM after LOTOS, change to 133.35
	DCT DEGNO DCT LO- TOS DCT	GOBRO		
BATHA	DCT KUTNA DCT MIGMA DCT	GOBRO	132.9* 133.35**	Follow ATS route L564, then enters FRA at BATHA @40NM after MIGMA, change to 133.35
	DCT KUTNA DCT MIGMA DCT ALNUG DCT	RIDIT	132.9* 132.5**	@ALNUG change to 132.5

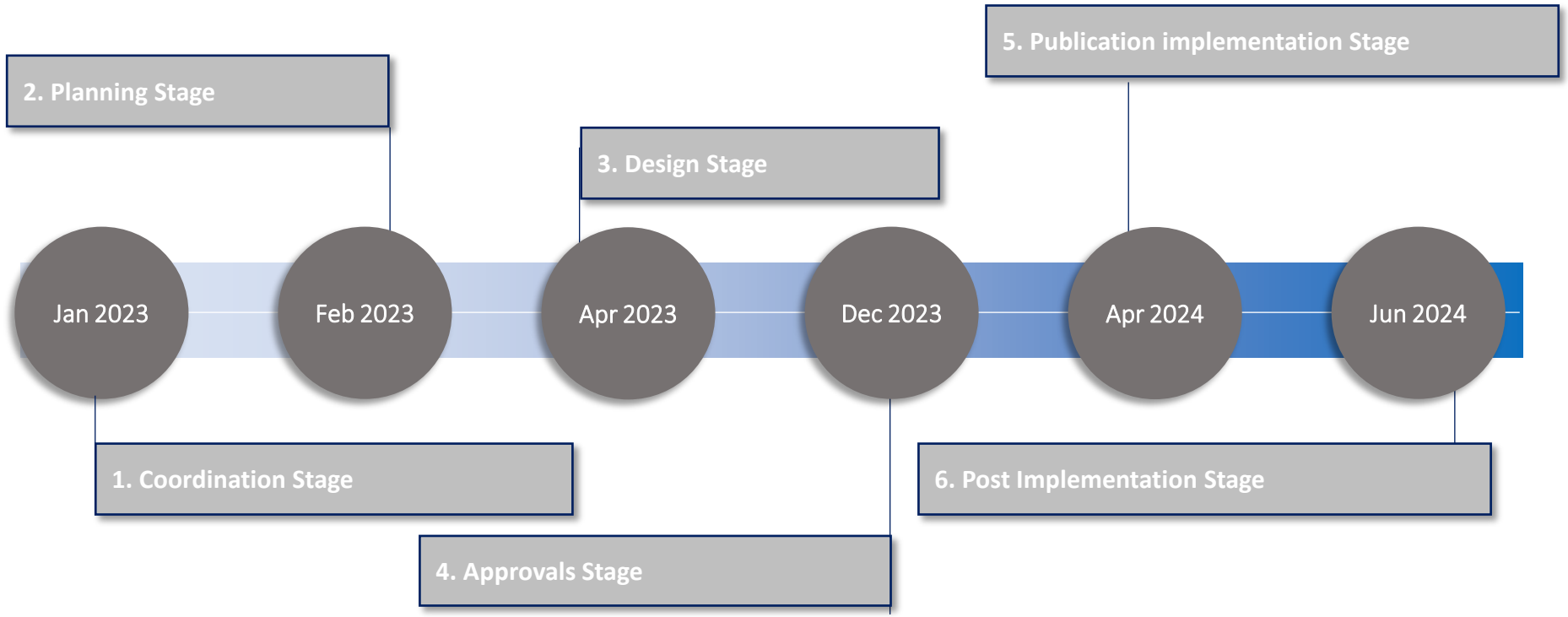
ULUXU	DCT	MUXIT	132.5* 132.9**	@100NM after ULUXU, change to 132.9
	DCT PURDA DCT	TANSU	132.5* 133.35**	@PURDA change to 133.35
AMBIT	DCT ASTIN DCT	GOBRO	132.5* 133.35**	@60NM after ASTIN, change to 133.35
RIDIT	DCT ALNUG DCT OBSEP DCT ASPUS DCT	LADBO	132.5* 132.9**	@ALNUG change to 132.9
NOMRU	DCT ASTIN DCT PUR- DA DCT	MUXIT	132.5* 134.5**	@PURUDA change to 134.5
	DCT ASTIN DCT	TANSU	132.5* 134.5**	@90NM after ASTIN, change to 134.5
SILPA	DCT MEDMO DCT METNO DCT	MIDGU	132.5* 133.35** 134.5***	@METNO change to 133.35 @100NM after METNO, change to 134.5
	DCT ASTIN DCT BOSOB DCT	SITUK	132.5* 132.9**	@80NM after ASTIN, change to 132.9
	DCT ASTIN DCT BOSOB DCT	ITRUX		
SITUK	DCT BOSOB DCT ASTIN DCT	SILPA	132.9* 132.5**	@80NM before ASTIN, change to 132.5
DUDRI	DCT MEDMO DCT METNO DCT	MIDGU	132.5* 133.35** 134.5***	@METNO change to 133.35 @100NM after METNO, change to 134.5

Note: The pilot must contact on the initial frequency (*) followed by the second (**) and third (***) frequencies, as applicable.

2.2.4.4 Descend in the FRA

If an aircraft needs to descend below FL300 before reaching the Exit waypoint, the pilot must obtain an alternative ATC clearance to exit the FRA and join a published ATS route.

3.2 IMPLEMENTATION PROCESSES



3.2 IMPLEMENTATION PROCESSES

Project Overview:

- Duration: Over a year and a half
- Scope: Comprehensive transformation of airspace operation
- Involvement: Internal and external stakeholders, including SANS, GACA, and national carriers

Key Stages:

- Planning and Design:
  - Team of ATCOs, flight procedure designers, and airspace planners
  - Simulated design concept for compatibility with existing operations
- Safety Assessment:
  - Comprehensive assessment conducted by SANS' Safety Team
  - GACA Approval: Implementation approved following review of necessary documents
  - ATCO Training: Classroom and simulator training prior to implementation

3.3 POST-IMPLEMENTATION

- The feedback from ATCOs was very encouraging. The change was accepted by ATCOs without any change to the procedures.
- However, initially concern was that several airlines were not adhering to FRA procedures, as reported by ATC.
- Pilots reported unaware of the change, although the publication were according to the AIRAC Cycle.
- The issue was eventually resolved, after coordinating with the operators to make sure airspace users are fully aware of the FRA procedures.

4. METHODOLOGY

- In FRA airspace, a user may freely plan a route from ENTRY point DCT (or via Intermediate point) to EXIT point.
- But this initial implementation is based on DCT routing via predetermined ENTRY and EXIT (or Intermediate) waypoints
- This methodology was considered to reduce complexity. It will also serve as a precursor for future expansion of FRA

Entry point	Routing	Exit	Control Frequencies	Remarks
PEKEM	DCT MEDPO DCT	SITUK	134.5* 132.9**	@MEDPO change to 132.9
	DCT MEDPO DCT	ITRUX		
TANSU	DCT	ULUXU	134.5* 132.5**	@175NM after TANSU, change to 132.5
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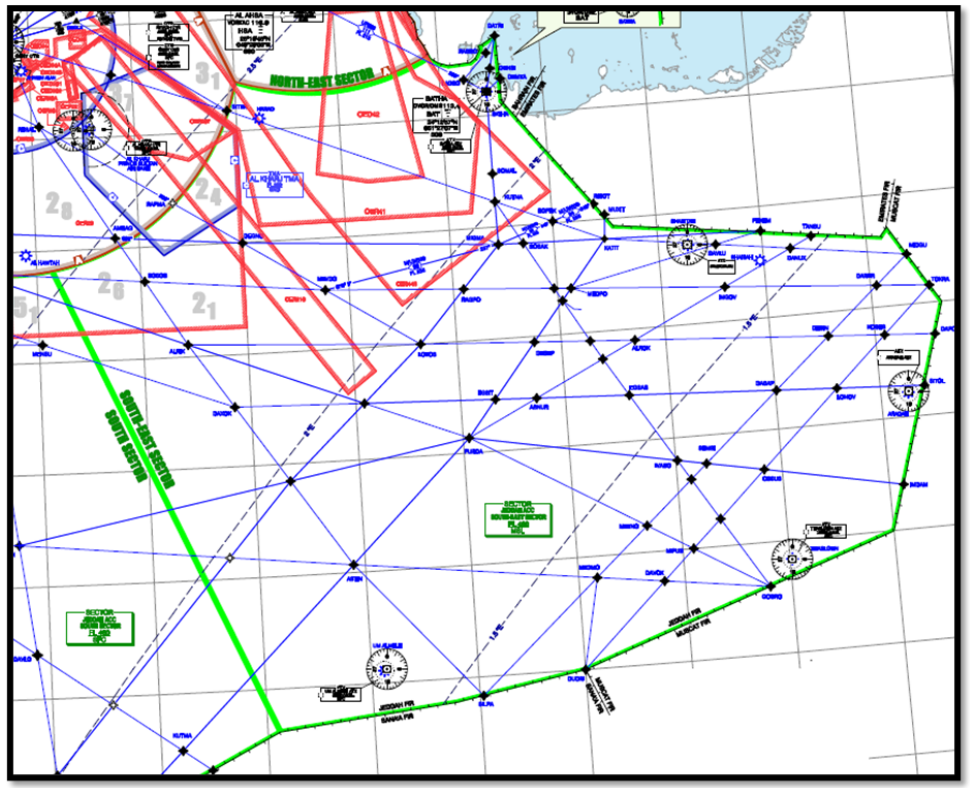
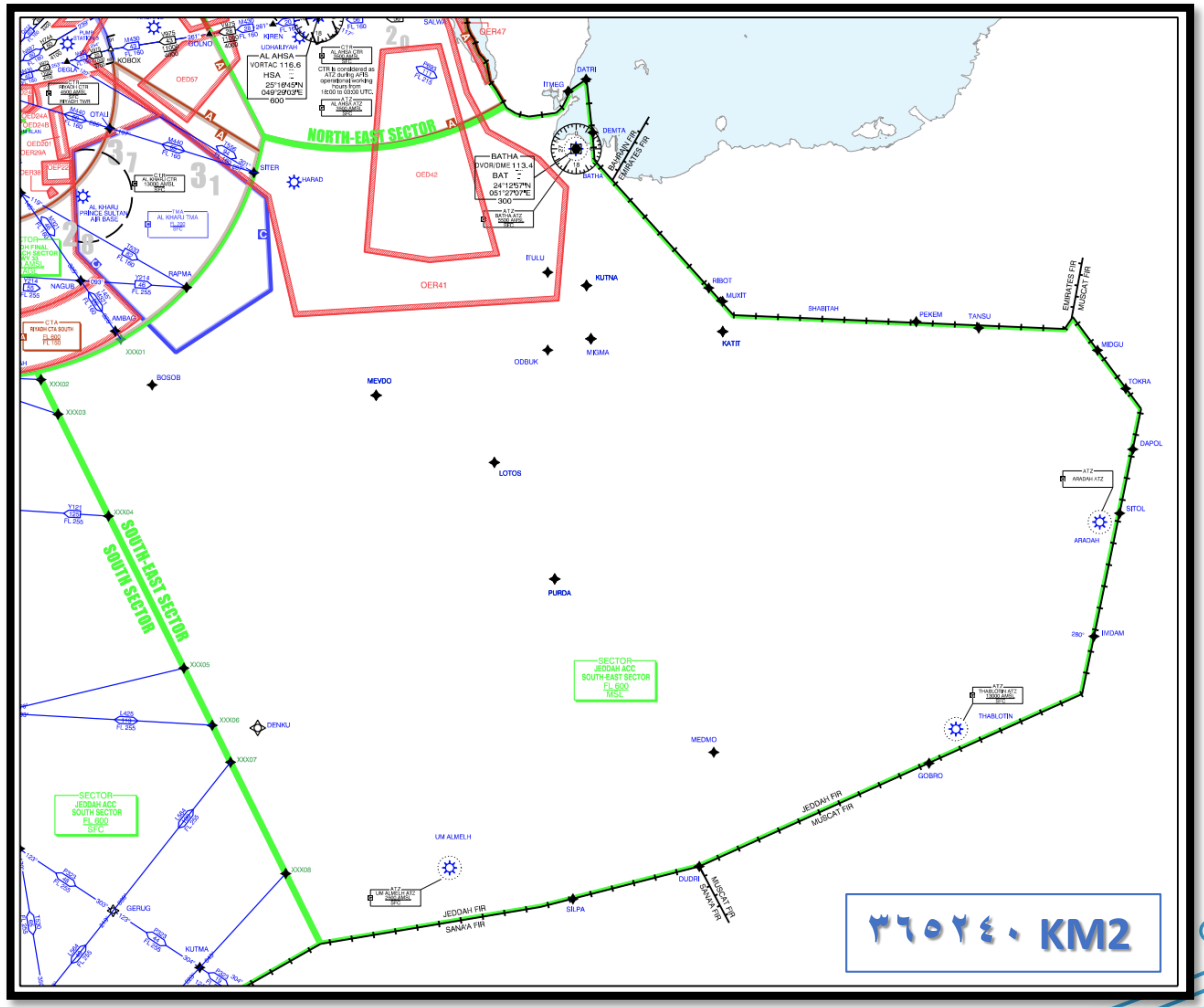
	DCT MEDPO DCT BOSOB DCT	ITRUX		
	DCT	DUDRI	134.5* 133.35** 132.5***	@80NM after TOKRA, change to 133.35 @85NM before DUDRI, change to 132.5
SITOL	DCT BOSOB DCT	SITUK	133.35* 132.9**	@200NM after SITOL, change to 132.9

Extraction from the FRA routing table in the AIP

5. BENEFITS

Saving: 30NM | Fuel: 308 | CO2: 985.6 | Time: 6.29





6. FUTURE EXPANSION OF FRA
6.1 General

- Free routes will be expanded to include whole Jeddah FIR, under the Saudi Future Airspace Concept (SFAC) project.
- The airspace users will have more freedom to plan routing from ENTRY to EXIT. The current restriction to use pre-determined ENTRY. INTERMEDIATE and EXIT waypoints will be removed.
- Cross-border FRA with adjacent FIRs will be our target goal under bilateral or regional agreements.

6. FUTURE EXPANSION OF FRA
6.2 Plan for FRA and Cross-border FRA between Saudi Arabia and Oman

- Oman is planning to implement the FRA.
- Implementation of cross-border FRA between Jeddah FIR and Muscat FIR is planned as a joint effort by the two countries.
- Muscat FIR and the Southeast sector of Jeddah FIR are adjacent, making it possible to implement cross-border FRA even before the procedures are expanded to whole Jeddah FIR
- Currently the traffic flow between Jeddah FIR and Muscat FIR take place via 6 transfer of control points (TCPs) along the common boundary. The cross-border FRA between Jeddah FIR and Muscat FIR will be implemented in line with the current traffic flow. The current TCPs will serve as FRA Entry/ Exit points.
- The success of this project will determine further expansion of FRA between the two FIRs. This may include making the current TCP as FRA Intermediate points; or allowing aircraft to plan a route from and Entry point in one FIR to an Exit point in another FIR, without an Intermediate point.

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