PBN IMPLEMENTATION IN JORDAN

Prepared by

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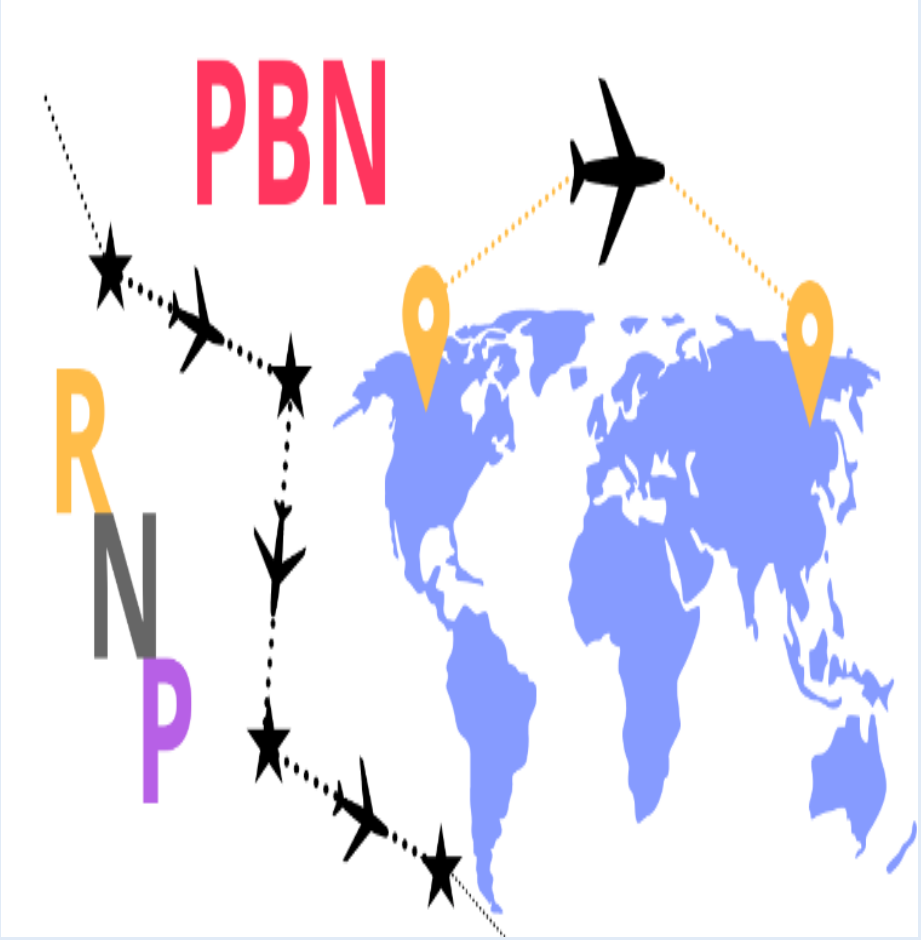
JORDAN

PBN SG/10 Meeting
(Amman, Jordan, 10 - 11 December 2025)

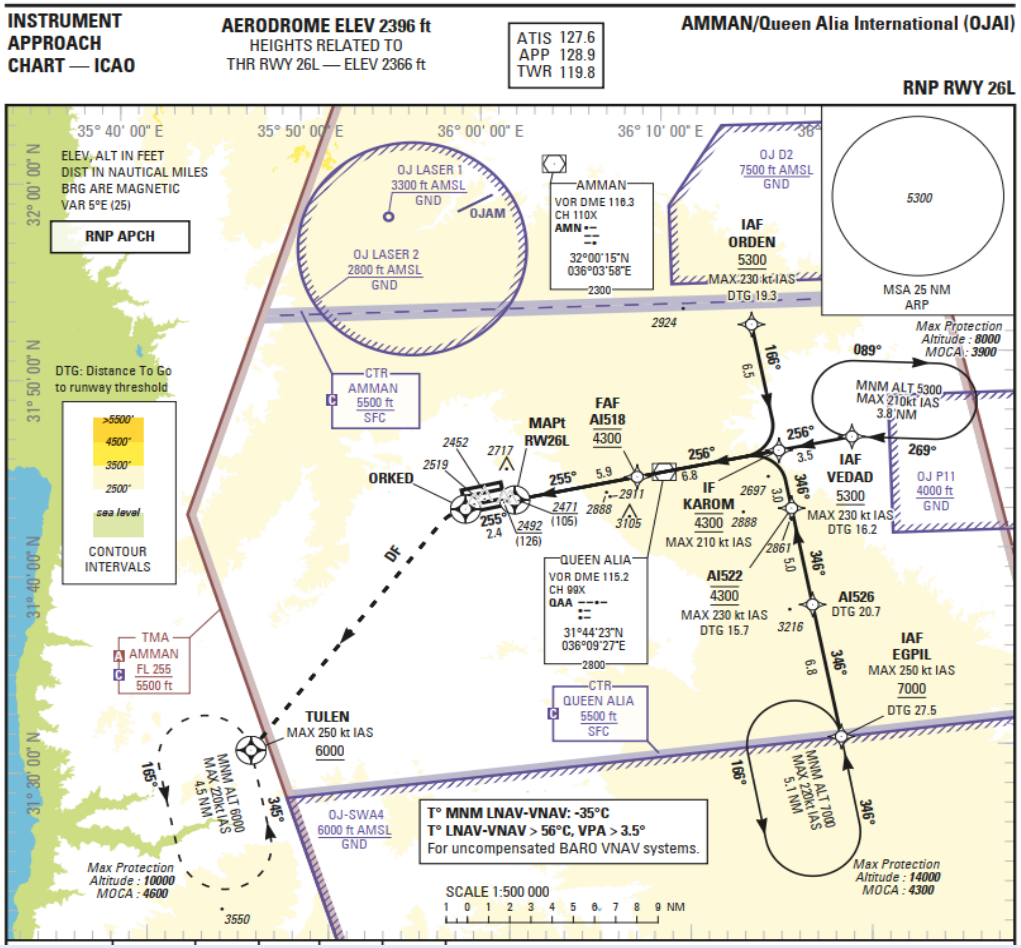
PBN IMPLEMENTATION OVERVIEW

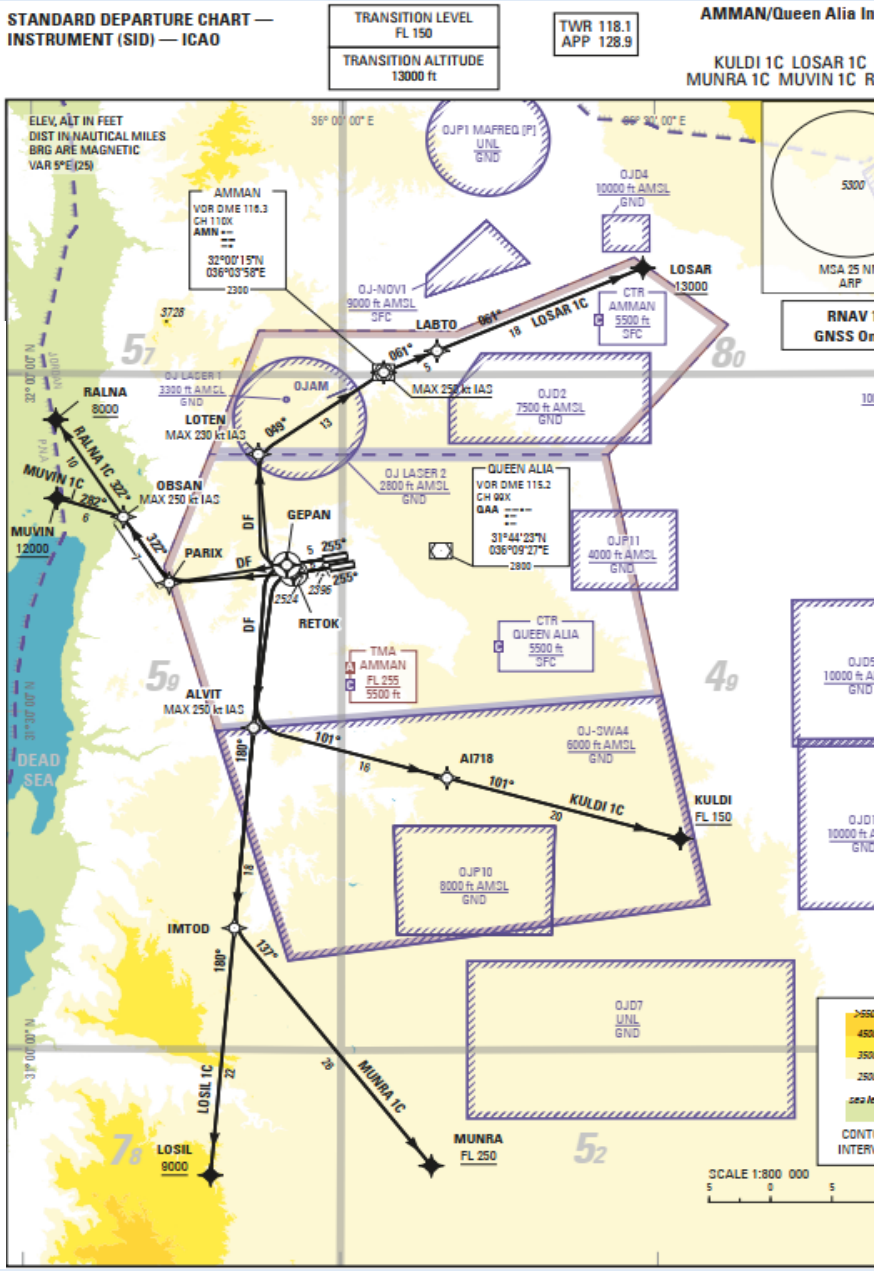
- New PBN Instrument Flight Procedures (IFPs) implemented across Jordan.
- Updated ATS routes enhancing capacity, efficiency, and safety.
- PBN infrastructure upgrades including DME/DME implementation.
- Major step in Jordan’s airspace modernization program.



UPDATED & MODERNIZED IFPS

- All runway ends at OJAI, OJAQ, and OJAM supported by:
- RNP Approaches
- ILS transitions
- Conventional procedures for redundancy.
- Supports CDO/CCO operations.

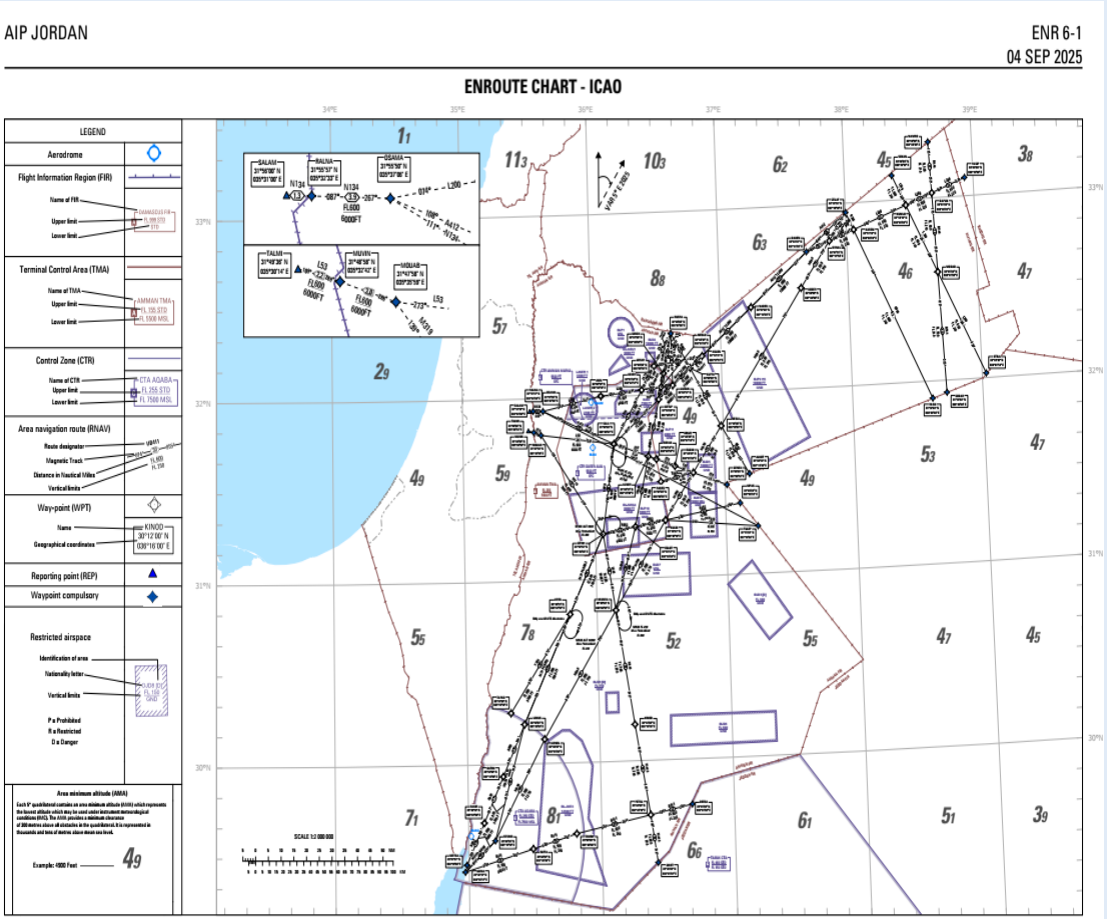




En-route chart modification

The Enroute chart has been modified to accommodate the new modifications as follows:

- **New routes have created to connect the SIDs and STARs with the upper routes in efficient way that will separate the inbound from the outbound as much as possible (example LOSAR, LUDAN)**
- **Routes designation has been changed to align with ICAO standards (no more UB411 , UM 690 etc)**
- **All routes have been reviewed taken into consideration magnetic variation route bearings and distances**



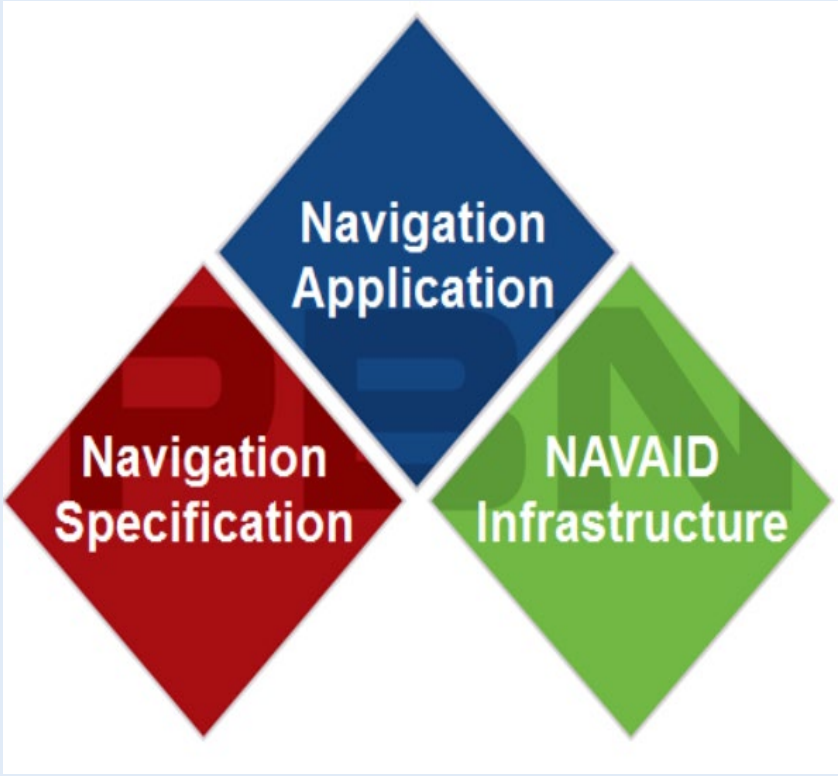
DME/DME Infrastructure Project

The required DME/DME-based navigation will be used for:

1. Providing redundancy and continuity of navigation infrastructure in case of GNSS jamming.

2. Increasing the integrity of navigation services.

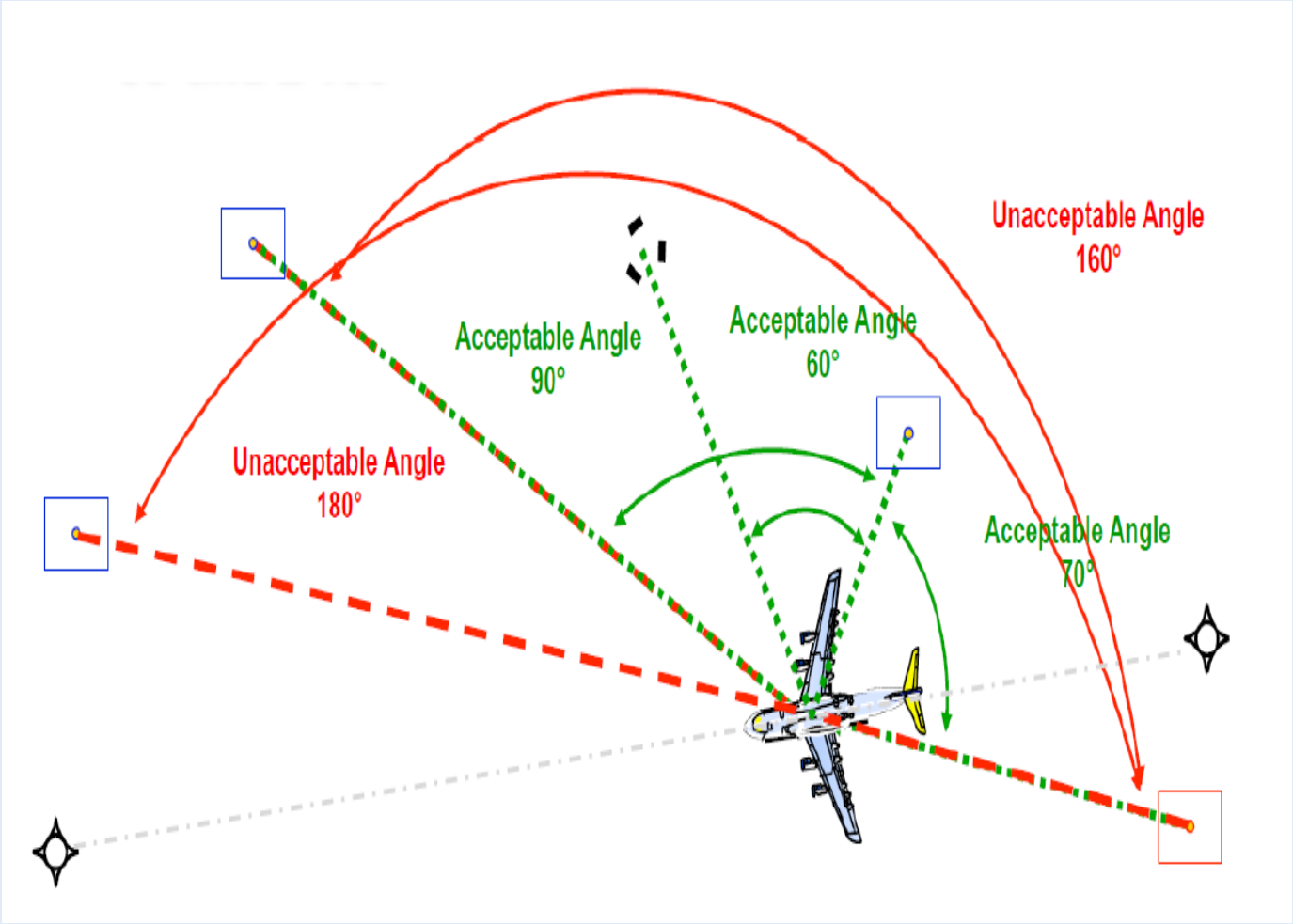
3. Ensuring that the infrastructure meets the required levels of accuracy and efficiency for terminal and en-route navigation.



Simulation & Regional Cooperation

- Simulations conducted with ICAO MID and Oman.
- Special focus on Aqaba coverage optimization.
- Multiple online meetings to refine planning.

DME/DME Infrastructure Project

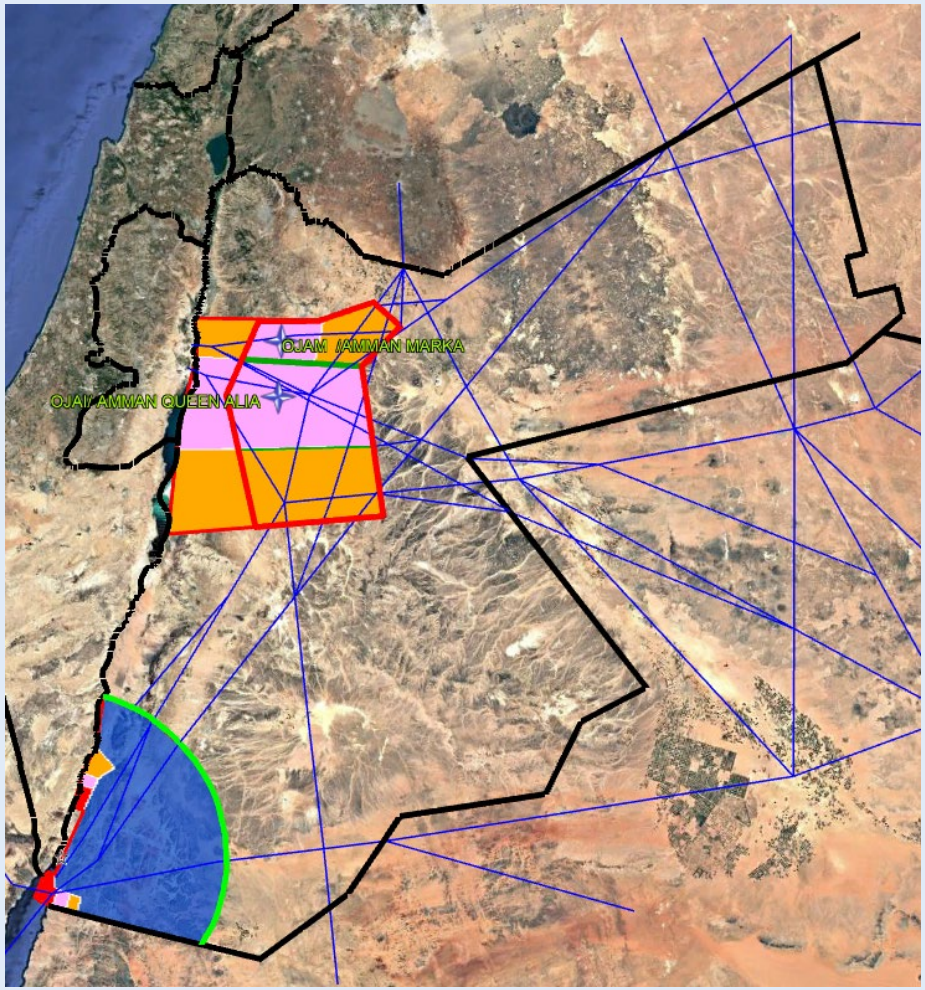


THE PROJECT PHASES

The phases of the project were divided into two phases:

Phase one : Amman and Aqaba TMAs (RNAV1) navigation specifications

Phase two : En-route (RNAV5) navigation specifications



THE REQUIREMENTS FOR DME DME IMPLEMENTATION

- Optimum DME distribution
- Minimum number of DME stations
- Critical DMEs
- Required coverage level
- Flight inspection and
- Publication modification

Optimum DME distribution

- With the cooperation of OMAN and ICAO MID multi-session were conducted to find out the best and optimum DME sites
- Some sites were proposed but finally removed from our calculations due to accessibility issues

Minimum number of DME stations

the minimum number of DMEs needed to comply with RNAV 1 navigation specifications are THREE

Table III-1-3-4. XTT, ATT and area semi-width for DME RNAV (RNAV 1) in en-route, arrival, initial/intermediate approach and departure phases of flight (NM)
Table based on availability of more than two DME update stations

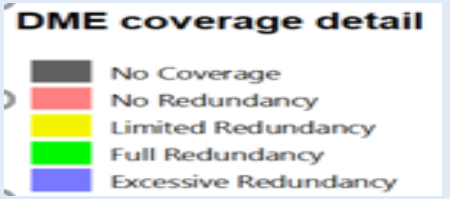
Altitude (ft)	*En-route/STAR/SID (>30 NM ARP)*			*STAR/IF/IAF (<30 NM ARP)*			*SID (<15 NM DER)*			*FAF*		
	XTT	*ATT*	*½ A/W*	*XTT*	*ATT*	*½ A/W*	*XTT*	*ATT*	*½ A/W*	*XTT*	*ATT*	*½ A/W*
15 000	For all altitudes			0.78	0.61	2.18	0.78	0.61	1.68			
14 000	0.78	0.61	3.18	0.77	0.59	2.16	0.77	0.59	1.66			
				0.76	0.57	2.14	0.76	0.57	1.64			
				0.75	0.56	2.12	0.75	0.56	1.62			
				0.74	0.54	2.10	0.74	0.54	1.60			
				0.72	0.52	2.08	0.72	0.52	1.58	0.58	0.52	1.37
				0.71	0.50	2.06	0.71	0.50	1.56	0.56	0.50	1.34
				0.70	0.48	2.04	0.70	0.48	1.54	0.54	0.48	1.32
				0.68	0.46	2.02	0.68	0.46	1.52	0.53	0.46	1.29
				0.67	0.44	2.00	0.67	0.44	1.50	0.51	0.44	1.26
				0.65	0.42	1.98	0.65	0.42	1.48	0.49	0.42	1.23
				0.64	0.40	1.96	0.64	0.40	1.46	0.47	0.40	1.20
				0.62	0.37	1.94	0.62	0.37	1.44	0.45	0.37	1.18

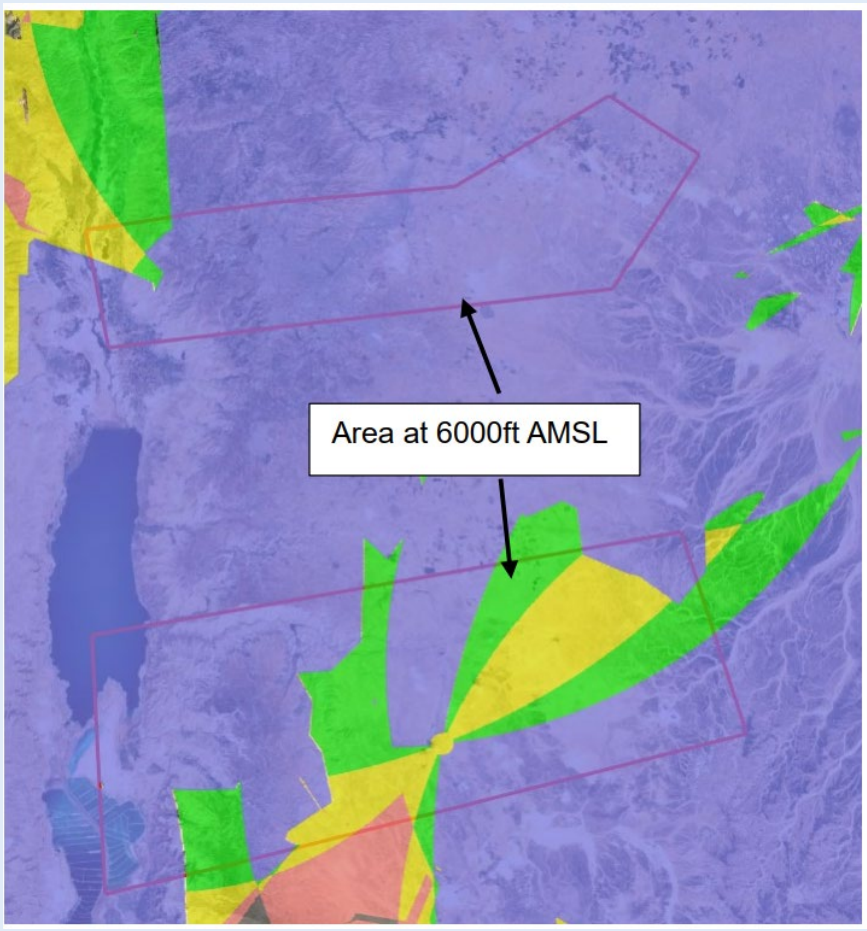
Table III-1-2-18. XTT, ATT and area semi-width for RNAV 1 and RNAV 2 (Cat A to E) in en-route, arrival, initial/intermediate approach and departure phases of flight (NM)

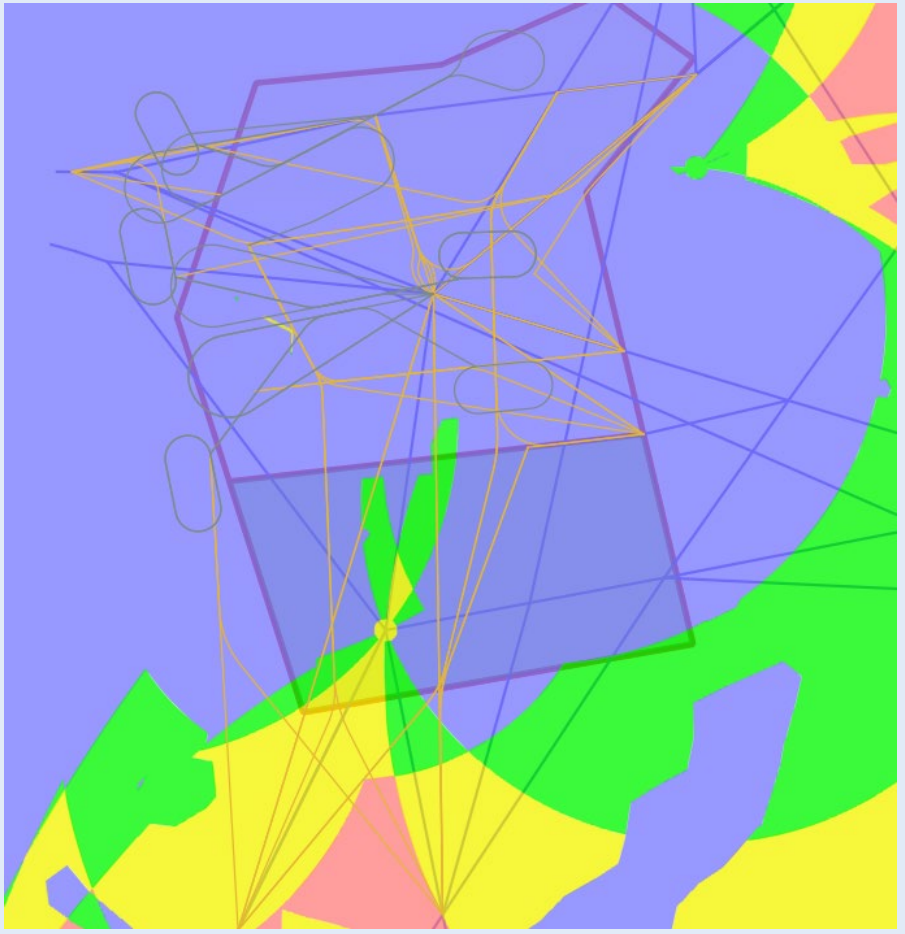
En-route/STAR/SID (>30 NM ARP)			*STAR/IF/IAF/SID (<30 NM ARP)*			*SID (<15 NM ARP)*		
XTT	*ATT*	*½ A/W*	*XTT*	*ATT*	*½ A/W*	*XTT*	*ATT*	*½ A/W*
2.00	1.60	5.00	1.00	0.80	2.50	1.00	0.80	2.00

THE REQUIRED COVERAGE

The coverage study was established based on the required level at certain phases of flight







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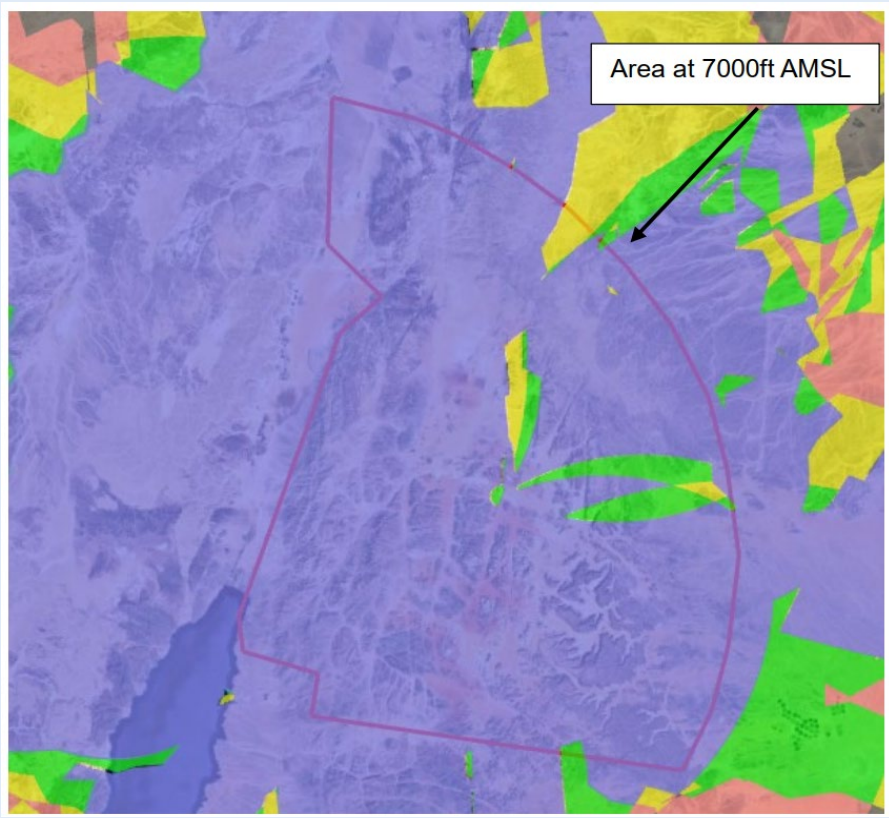
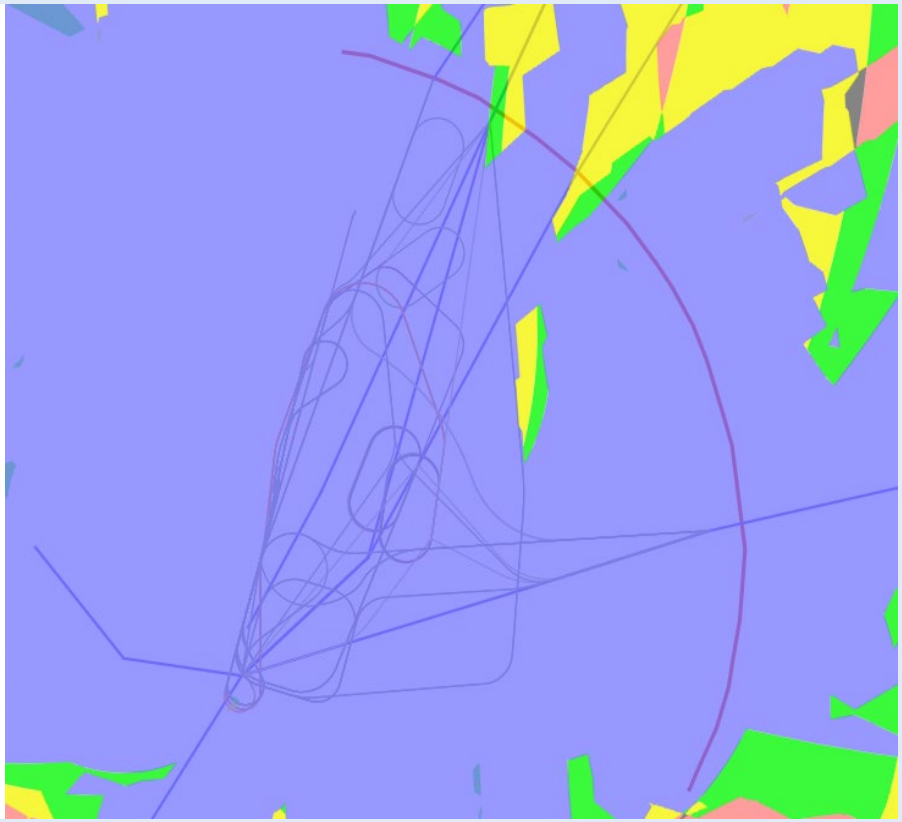
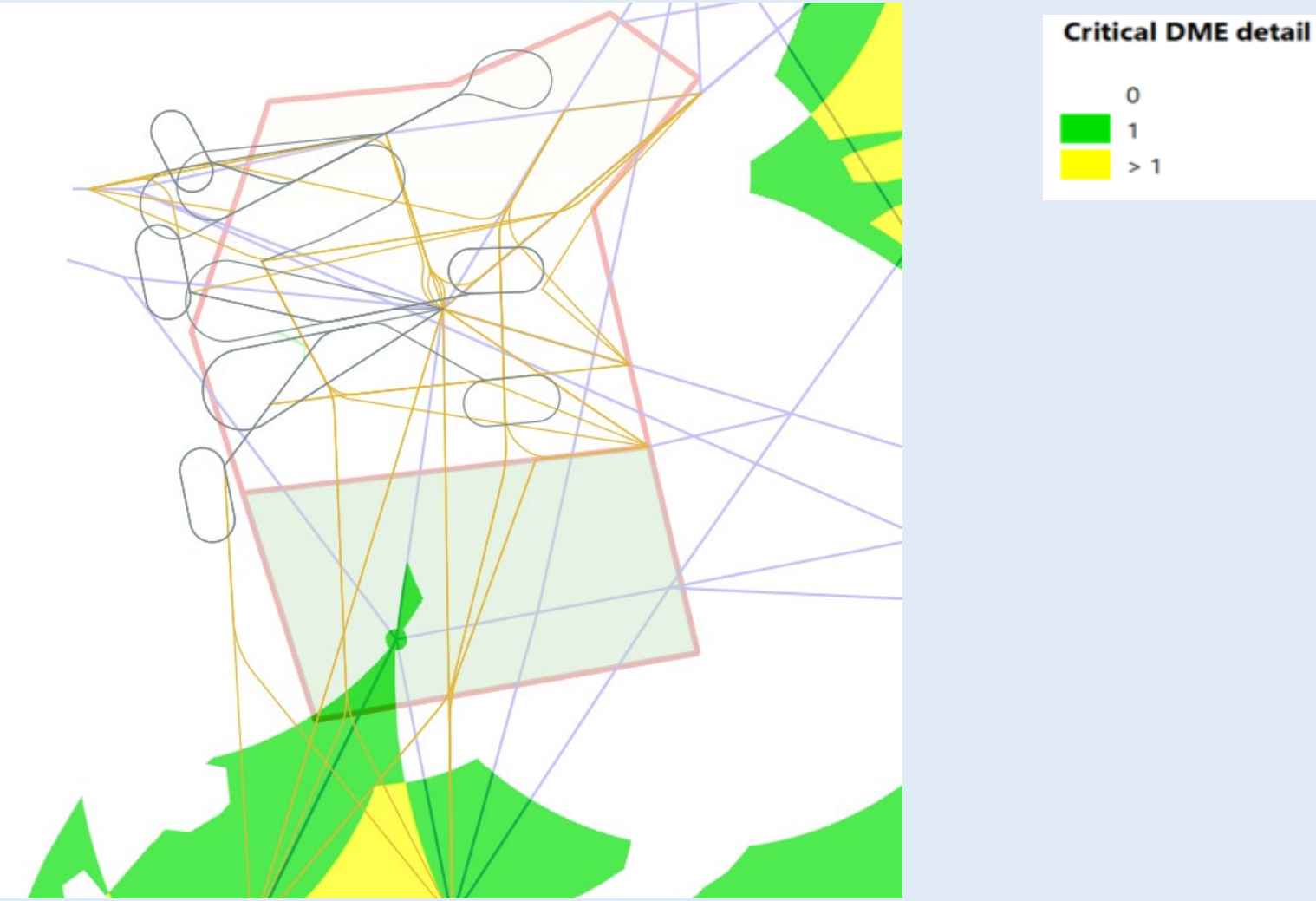


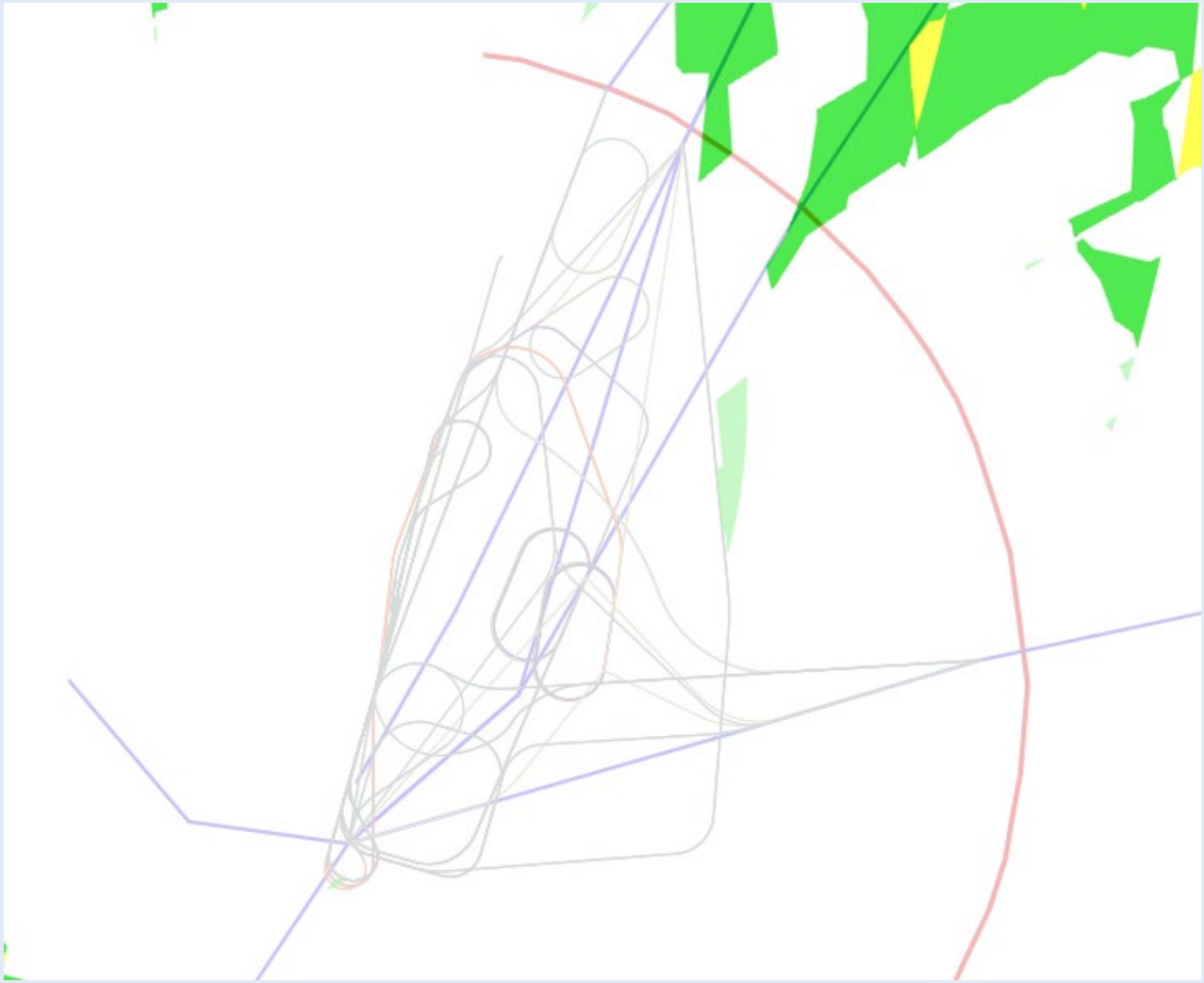


CRITICAL DMEs AMMAN TMA

The study also took into account the critical DMEs
The critical DMEs have to be mentioned



CRITICAL DMEs AQABA TMA



Critical DME detail

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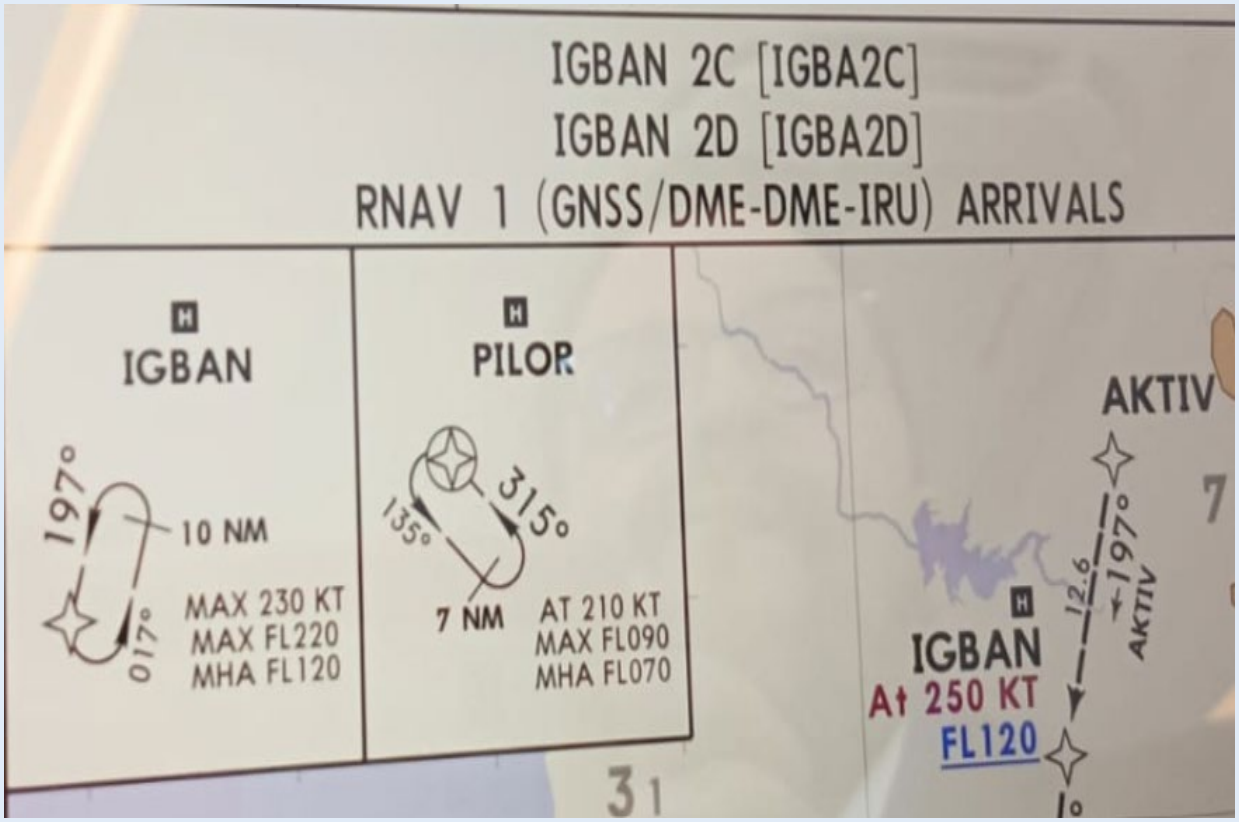
FLIGHT INSPECTION REQUIREMENTS

The flight inspection is required to make sure the reception of the DMEs at all phases of flight

AIP PUBLICATION

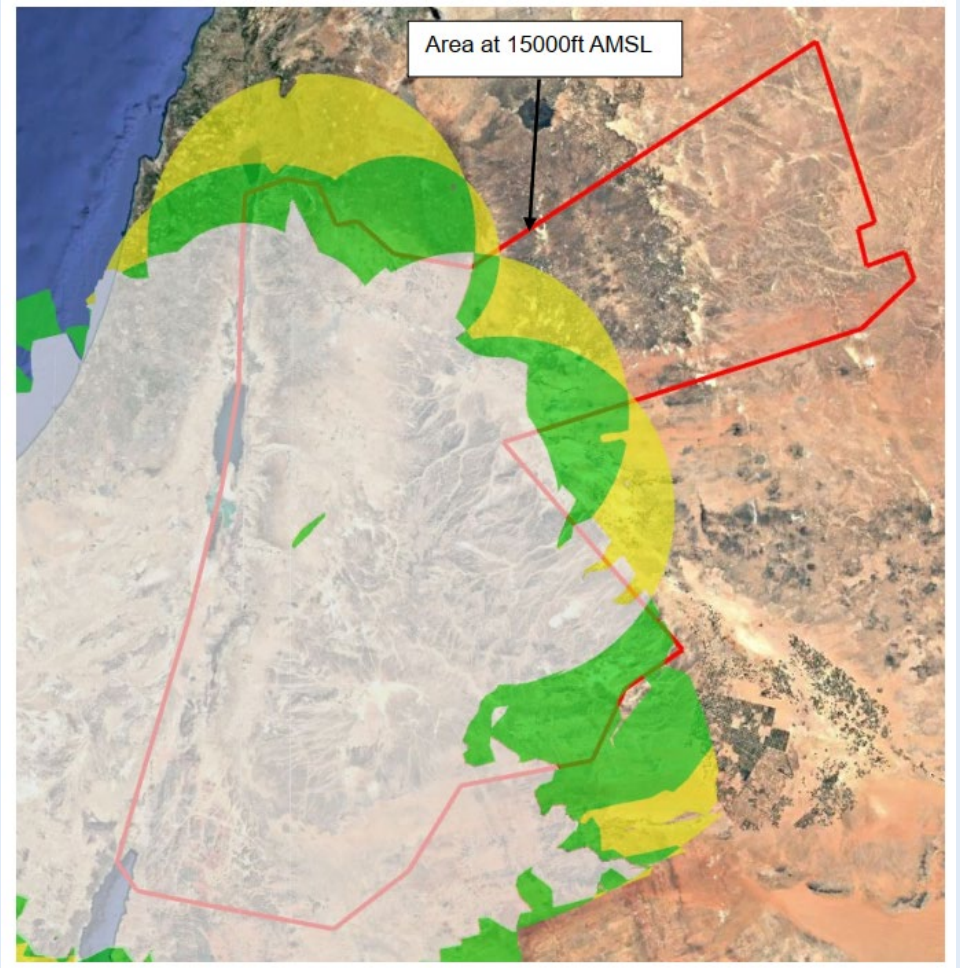
Charts modification

DME coordinates



Next Phase: FIR Wide Coverage

- Expansion planned to include full Jordan FIR.
- Future cooperation with adjacent FIRs.
- Strengthened regional navigation infrastructure.



Thank you