MIDANPIRG PBN SG/3 Meeting
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United Arab Emirates

Presented by

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Presentation Outline

- **Brief of the UAE PBN Implementation Plan**

- **Status of Implementation**

- **Post assessment results of the PBN Implementation**

- **Lessons Learned**

- **Challenges**

- **Recommendations**

National PBN Implementation Plan

- UAE PBN Implementation plan version 01_2018.
  - Short Term   – 2014 - 2017
  - Medium Term   – 2018 – 2023
  - Long Term   – 2023 and beyond

- Short term is fully implemented (Slide 4 has further detail)
  - Mandated the carriage of GNSS equipment with effect from **07 December 2017**

- Medium term focusses on transitioning from RNAV-1 (GNSS) to Advanced RNP and the initial introduction of GBAS at selected airports.
  - Mandated ADS-B OUT with effect from **01 January 2020**

- Long Term focusses on the use of advanced flight deck automation that integrates CNS capabilities. RNP, RCP, and RSP standards will define these operations.

Status of Implementation

UAE ARP 3 is an Integration and Implementation Project which redesigned the UAE airspace both within the upper and lower network of the Emirates FIR. The network is predicated on PBN RNAV-1 Navigation Specification and requires operators to be equipped with GNSS.

The new network has been designed to be capable of supporting the forecasted 2020 traffic demand in UAE, representing in addition the base for the development of future airspace concepts, supporting the traffic demand of the following timeframes 2016-2020, 2022-2025 and 2035 covering 2040 demand.

The new network became effective on **December 7th 2017** with AIRAC publication 13/2017.

Delivers environmental efficiency and fuel savings exceeding $15 million to the airlines customers within the first year after implementation, translating to around 100,000 Mt of CO_2, supporting a significant contribution towards the UAE's Environmental Policy and responsibilities towards 'Greener' aviation"

Status of Implementation

- Introduction of 30 new Routes

- Allocation of 407 new 5LNC and Alphanumeric Waypoints

- Incorporation of over 200 Instrument Flight Procedures (IFPs)

- Airspace boundary changes for both Dubai and Abu Dhabi CTAs

- Introduction of new En-route and CTA Sectorisation and amendments to current.

- Requirement for over 250 Air Traffic Controllers to be trained on the UAE ARP 3.

- 1000+ changes related to 312 new/modified route segments

- Upload of 1741 route segments related to 115 new SIDs and 111 new STARs (OMAA, OMAD, OMAL, OMDB, OMDW, OMSJ, OMFJ, OMRK)

Status of Implementation

1. Supporting Regulations
   * CAR-FPD Issue 2, CAR OPS 1 – Domestic Operators and CAR PART 4 – Foreign Operators
2. Dedicated PANS-OPS Inspectorate
   * GCAA-ANA with 2 Inspectors
3. Airspace concept
   * Fully performance based with RNAV-1 (GNSS) Navigation Specification, transitioning to Advanced RNP in the medium term.
4. Procedure Design Entity
   * 3 Domestic and 8 Foreign based design organizations certified and audited on a regular basis.
5. Number of procedure designers
   * 6 Domestic and multiple foreign based.
6. Automated tools
   * Various – Including PHX and FPDAM

Status of Implementation

RWY Ends	ILS / CAT	LNAV	LNAV/ VNAV	LPV	RNP AR	RNAV SID	RNAV STAR
OMAA13L	III	X	X	N/A	Y	Y	Y
OMAA13R	I	X	X	N/A	Y	Y	Y
OMAA31L	III	X	X	N/A	Y	Y	Y
OMAA31R	III	X	X	N/A	Y	Y	Y
OMAD31	I	Y	X	N/A	X	Y	Y
OMAD13	X	Y	X	N/A	X	Y	Y

Status of Implementation

RWY Ends	ILS / CAT	LNAV	LNAV/ VNAV	LPV	RNP AR	RNAV SID	RNAV STAR
OMAL01	I	Y	Y	N/A	X	Y	Y
OMAL19	X	Y	Y	N/A	X	Y	Y
OMDB12L	III	Y	Y	N/A	X	Y	Y
OMDB12R	III	Y	Y	N/A	X	Y	Y
OMDB30L	III	Y	Y	N/A	X	Y	Y
OMDB30R	III	Y	Y	N/A	X	Y	Y

Status of Implementation

RWY Ends	ILS / CAT	LNAV	LNAV/ VNAV	LPV	RNP AR	RNAV SID	RNAV STAR
OMDW12	II	Y	Y	N/A	X	Y	Y
OMDW30	II	Y	Y	N/A	X	Y	Y
OMFJ11	X	X	X	N/A	X	Y	X
OMFJ29	I	Y	Y	N/A	X	Y	Y
OMRK16	X	Y	Y	N/A	X	Y	Y
OMRK34	I	Y	Y	N/A	X	Y	Y

Status of Implementation

RWY Ends	ILS / CAT	LNAV	LNAV/ VNAV	LPV	RNP AR	RNAV SID	RNAV STAR
OMSJ12	II	Y	Y	N/A	Y	Y	Y
OMSJ30	II	Y	Y	N/A	Y	Y	Y

Post assessment of PBN Implementation

GCAA reviews reports from ATC and Aircrew on a daily basis to ensure that there are no safety considerations.

In accordance with UAE CAAP 25, post-implementation reviews are conducted 10, 30 and 60 days after implementation in order to ensure safe operations and identify any hot spots.

A full review will be conducted in July 2018 in order to verify that all deliverables were met and to propose any refinements to the network.

Efficiency measurement to be done monthly and reported after one year to validate the fuel and emissions savings predicted

Lessons Learned

1. Accurate description of the project deliverables

2. Don't allow project creep

3. Dedicated project team – this is not a part time job

4. Include all stakeholders – ANSP's, airports, operators, regulator, MET, neighboring states, ICAO, IATA.

5. Allow sufficient time – minimum of 2 years depending on the scope

6. Contingency planning is critical

7. Dedicated transition plan with milestones

8. Training – ATC and Aircrew

9. Communicate….. All the time – Internal and external stakeholders

Challenges

- Time – there just is never enough

- Neighboring FIR restrictions

- Foreign Operator technical compliance (RNAV-1 with GNSS)

- Publication – AIM Quality is critical as PBN is purely data driven

- Training and refresher training

- Weather – during transition

- ATM Systems and compatibility

- Seamless transition to the new Airspace

Thoughts/Recommendations

- Dedicated project office to manage deliverables and time lines

- Early interaction with Neighbors to establish the limits of any changes

- Engage with Foreign Operators well in advance of planned transition in order to ensure compliance

- Continuous quality checks on all data – more is better

- Plan training schedules well in advance to ensure readiness of controllers and aircrew

- Engage with MET providers early in order to obtain accurate forecasts – specifically for the Transition Day.

- Dedicated team to ensure ATM system interoperability and enterprise architecture

- Regulations – must be in place to facilitate PBN implementation

Thank you