



TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

Agenda Item 2: Aerodrome operations – improving airport performance

2.2: Performance-based navigation (PBN) – a practical way to improve airport performance with safety and efficiency

UAE AIRSPACE DEVELOPMENTS

(Presented by the United Arab Emirates)

SUMMARY

In 2011, the United Arab Emirates (UAE) developed its performance-based navigation (PBN) implementation plan. This sought to provide guidance on the on-going enhancement of aviation in order to ensure that developments of the UAE airspace match the requirements of ICAO and those of the international aviation community. This information paper provides a report in achieving near term implementation strategy tasks.

1. INTRODUCTION

1.1 The General Civil Aviation Authority (GCAA) of the UAE is pleased to announce that the short term targets of the United Arab Emirates (UAE) performance-based navigation (PBN) implementation plan have been met and exceeded.

1.2 ICAO set a target of 30% implementation by 2010, 70% by 2014 and 100% by 2016, for the implementation of both RNAV 1 SIDs/STARs and RNP approach /VNAV. In the UAE, the UAE set an internal target of 50% by 2012, 80% by 2014 and full implementation by 2016.

1.3 We are proud to announce that the 2012 target have already been exceeded with the introduction in July of RNP AR Approach procedures and RNAV 1 STARs at Abu Dhabi and the introduction of RNAV 1 SIDs and STARs at Dubai and Sharjah in August 2012.

2. DISCUSSION

2.1 The plan provides a high-level strategy for the evolution of navigation capabilities to be implemented in three timeframes: near-term (2012-2014), mid-term (2014-2016), and long-term (2017 and beyond). The strategy rests upon two key navigation concepts: area navigation (RNAV) and required navigation performance (RNP). It also encompasses instrument approaches, standard instrument departure (SID) and standard terminal arrival (STAR) operations, as well as en-route continental and remote operations. The section on long-term initiatives discusses integrated navigation, communication, surveillance and automation strategies. The key tasks involved in the transition to PBN are:

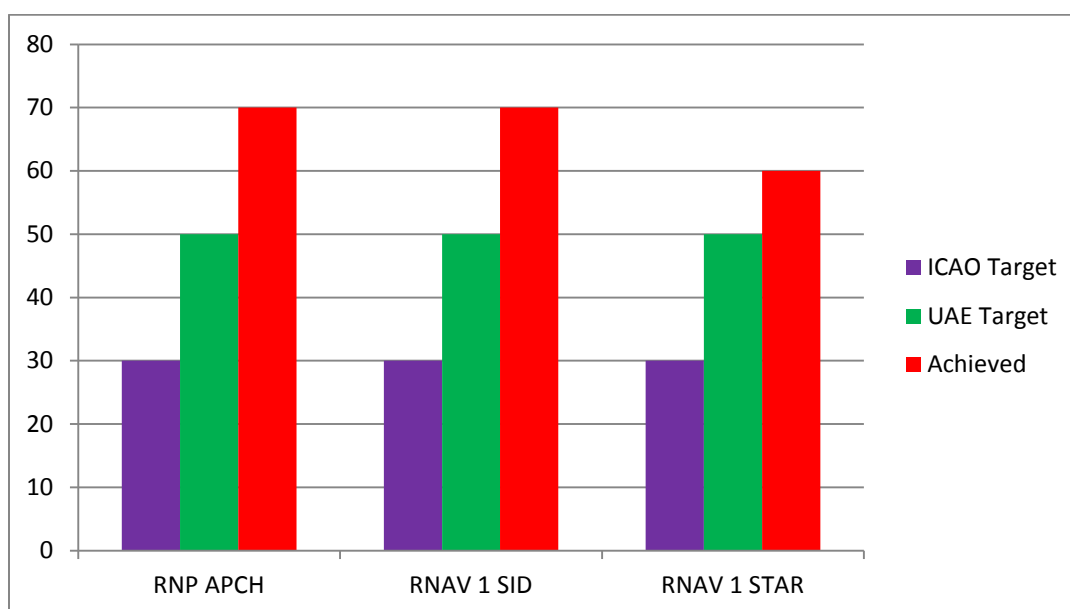
- a) establishing navigation service needs through the long-term that will guide infrastructure decisions and specify needs for navigation system infrastructure, and ensure funding for managing and transitioning these systems;

- b) defining and adopt a national policy enabling additional benefits based on RNP and RNAV;
- c) identifying operational and integration issues between navigation and surveillance, air-ground communications, and automation tools that maximize the benefits of RNP;
- d) supporting mixed operations throughout the term of this Roadmap, in particular considering navigation system variations during the near term until appropriate standards are developed and implemented;
- e) supporting civil/military coordination and develop the policies needed to accommodate the unique missions and capabilities of military aircraft operating in civil airspace;
- f) harmonizing the evolution of capabilities for interoperability across airspace operations;
- g) increasing emphasis on human factors, especially on training and procedures as operations increase reliance on appropriate use of flight deck systems;
- h) facilitating environmental analysis efforts required to support the development of RNAV and RNP procedures; and
- i) maintaining consistent and harmonized global standards for RNAV and RNP operations.

Achieved targets 2012

- RNP APCH (with Baro-VNAV) in 70% of instrument runways in 2012 of which 20% are RNP-ARR;
- NAV-1 SID for 70% of international airports by 2012; and
- RNAV-1 STAR for 60% of international airports in 2012.

2012 PBN achievements against targets



Terminal areas (departures and arrivals)

2.2 RNAV reduces conflict between traffic flows by consolidating flight tracks. RNAV-1 RNP-1 SIDs and STARs improve safety, capacity, and flight efficiency and also lower communication errors.

2.3 UAE GCAA will continue to plan, develop and implement RNAV-1 SID and STAR at major airports and guide associated changes in airspace design. RNAV-1 will be implemented in airspace where there is sufficient surveillance coverage and RNP-1 where there is no such coverage.

2.4 Where operationally feasible, UAE GCAA in conjunction with adjacent ATS units will develop operational concepts and requirements for continuous descent arrivals (CDAs) and continuous climb departures (CCDs) based on FMS Vertical Guidance and for applying time of arrival control based on RNAV and RNP procedures. This would reduce workload for pilots and controllers as well as increase fuel efficiency.

2.5 PBN SID and STAR allow the following:

- a) reduction in controller-pilot communications;
- b) reduction of route lengths to meet environmental and fuel efficiency requirements;
- c) seamless transition from and to en-route entry/exit points; and
- d) facilitate and advance environmental analysis efforts required to support the development of RNAV and RNP procedures.

2.6 Full version of the UAE PBN implementation plan is available on the GCAA website www.gcaa.gov.ae.

Summary

Airspace	Navigation specifications	Navigation specifications where operationally required
En-route remote continental	RNAV-5	RNAV-1
En-route continental	RNAV-5	RNAV-1
TMA arrival/departure	RNAV-1 in a surveillance environment Basic RNP-1 in non-surveillance environment	
Approach	RNP APCH /VNAV or RNP AR APCH if required	

Implementation Targets

- RNP APCH (with Baro-VNAV) in 50% of instrument runways by 2012 and 80% by 2014 and priority given to airports with operational benefits;
- RNAV-1 SID/STAR for 50% of international airports by 2012 and 80% by 2014 and priority given to airports with RNP approach; and
- Review existing conventional and RNAV routes to transition to PBN RNAV-5 or where operationally required RNAV-1 by 2012.

Acknowledgement and Appreciation

2.7 The GCAA acknowledges and appreciates the work done by the UAE based Airlines, the air navigation service providers (ANSPs) involved and the certified procedure design Organizations associated with the various projects aimed at the development and introduction of the new procedures in a timely manner. It is through this collaborative process that we have been able to exceed even our own targets.

The National Airspace Advisory Committee (NASAC)

2.8 The NASAC provides an industry-wide representation forum for developing the industry position on airspace matters as the basis for strategic advice to the GCAA, regarding the development and implementation of the UAE ATM strategic plan. NASAC is composed of UAE ANSPs, airports, airlines, UAE Military and the regulator.

3. CONCLUSION

3.1 The Conference is invited to take note of the information contained in this paper.

— END —