



International Civil Aviation Organization

**SIXTEENTH MEETING OF THE
COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND
METEOROLOGY SUB-GROUP (CNS/MET SG/16) OF APANPIRG**

Bangkok, Thailand, 23 – 27 July 2012

Agenda Item 5: Navigation

PBN, APV AND NAVAIDS IN AUSTRALIA

(Presented Australia)

SUMMARY

This paper is a briefing on Australia's progress to deploying Performance Based Navigation (PBN) and AProach with Vertical guidance (APV) in response to ICAO Resolutions A36/23 and A37/11. The paper also outlines Australia's provision for contingency navigation.

This paper relates to –

Strategic Objectives:

A: Safety - *Enhance global civil aviation safety*

C: Environmental Protection and Sustainable Development of Air Transport - *Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiatives:

GPI-5 RNAV and RNP (Performance-based navigation)

GPI-7 Dynamic and flexible ATS route management

GPI-15 Match IMC and VMC operating capacity

GPI-21 Navigation systems

1. Introduction

1.1 ICAO Resolutions A36/23 and A37/11 set direction worldwide for the adoption of Performance Based Navigation (PBN) as the regulatory framework for area navigation of aircraft and AProach with Vertical guidance as the preferred minimum standard for instrument approach.

1.2 The deployment of PBN allows an aircraft to be flown along an arbitrary pre-planned path and is intended to remove the navigation constraints on aircraft operations enabling more efficient, environmentally friendly and safer aircraft operation. PBN enables more flexible airspace design facilitating implementation of runway connected Standard Terminal Arrival Routes (STARs), Continuous Descent Operations (CDO), Continuous Climb Operations (CCO), User Preferred Route (UPR) and ultimately User Preferred Trajectory (UPT). PBN also supports greatly increased

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navigation accuracy and integrity enabling operations into terrain challenged airports such as Juneau (Alaska), Queenstown (New Zealand), Linzhi (China). PBN can be effectively used to avoid “virtual terrain” (politically or noise sensitive areas) adjacent to airports.

1.3 APV provides continuous lateral and vertical guidance throughout approach to landing. This allows more accurate management of aircraft position and speed reducing the risk of controlled flight into Terrain (CFIT) during landing operations and risk of runway overrun.

2. PBN and APV Planning

2.1 The Australian Government aviation agencies, in conjunction with the aviation industry, have developed and published “The Australian PBN Implementation Plan”. A copy of the plan and a related PBN article can be downloaded from:

http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_100127

2.2 Australia has adopted the RNP family of PBN navigation specifications with GNSS (GPS) as the enabling technology. The RNP navigation specifications support greater navigation accuracy and integrity enabling greater efficiency and environmental benefits to be realized. To facilitate transition, the RNAV family of navigation specifications with GNSS (GPS) as the enabling technology will be deployed in parallel.

Oceanic	RNP-4	and RNP-10 (RNAV-10) for a protracted transition period
En Route	RNP-2	and RNAV-5 for a short transition period
Terminal	RNP-1	and RNAV-1 for a short transition period
Approach	RNP-APCH	previously known as RNAV(GNSS) and GPS Approach

2.3 Aircraft will be required to navigate to basic PBN RNP/RNAV standards by 4 February 2016.

3. Regulations and Mandate

3.1 To support the implementation of PBN/RNP, Australia has completed extensive industry consultation before finalizing the regulations for:

- Mandatory carriage of navigation equipment to support PBN; and
- Navigation Authorisations incorporating PBN Navigation Specifications.

3.2 The draft rules mandating the carriage of navigation system or equipment to allow navigation to PBN RNP/RNAV using GPS standards can be downloaded from:

http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_100829

3.3 The Proposed Civil Aviation Order (CAO) 20.91 Navigation Authorisations – Incorporating ICAO PBN Navigation Specifications can be downloaded from:

http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_100537

3.4 The draft rules require aircraft to be fitted with PBN navigation by 6 February 2014 (forward fit) or 4 February 2016 (retrofit).

4. Provision of Contingency Navigation

4.1 GNSS has been selected as the enabling technology to support deployment of PBN. As mitigation against a pilot encountering difficulty using GNSS, a selected set of approximately 215 terrestrial navigation aids is being retained to provide terminal and non-precision approach guidance at an adequate airport.

4.2 A list of the terrestrial navigation aids that are to be retained can be downloaded from:
http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_100829

5. Precision Approach

5.1 Major Australian capital city and regional airports provide precision approach guidance using ILS.

5.2 GLS is currently being deployed at Sydney; it is anticipated that it will be available for CAT-I service by end of 2012.

6. Action by the Meeting

- 6.1 The meeting is invited to:
- a) note the information contained in this paper; and
 - b) discuss any relevant matters as appropriate.

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