



International Civil Aviation Organization

**FIFTEENTH MEETING OF THE
COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND
METEOROLOGY SUB-GROUP (CNS/MET SG/15) OF APANPIRG**

Bangkok, Thailand, 25 – 29 July 2011

Agenda Item 5: Navigation

4) other radio navigaiton issues

FUTURE ASIA/PACIFIC AIRSPACE CONCEPT OF OPERATIONS

(Presented by IATA)

SUMMARY

This paper presents a concept for Asia/Pacific (APAC) airspace in the future, in order to lead discussion to a defined Concept of Operations that airlines can work towards.

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-1 Flexible use of airspace

GPI-3 Harmonization of level systems

GPI-4 Alignment of upper airspace classifications

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

GPI-6 Air traffic flow management

GPI-7 Dynamic and flexible ATS route management

GPI-8 Collaborative airspace design and management

GPI-9 Situational awareness

GPI-10 Terminal area design and management

GPI-11 RNP and RNAV SIDs and STARs

GPI-12 Functional integration of ground systems with airborne systems

GPI-16 Decision support systems and alerting systems

GPI-17 Data link applications

GPI-21 Navigation systems

GPI-22 Communication infrastructure

GPI-23 Aeronautical radio spectrum

1. INTRODUCTION

1.1 This paper presents the Asia Pacific Airspace Concept of Operations.

1.2 The premise for the Concept is that many of the operational enhancements today are reliant on technical capabilities in particular in CNS. New aircraft today are delivered with many of these capabilities as standard fit, however, enablement of many of the benefits relies on the ground CNS/ATM capability.

1.3 The Concept of Operations builds on the IATA User Expectations that were adopted by APANPIRG/19.

1.4 Also, following concerns raised by States regarding the definition of Oceanic and continental type airspace, particularly with regard to PBN based implementation, IATA sought clarification from ICAO during ATM/AIS/SAR/20 in 2010.

1.5 ICAO confirmed that application of procedures/specifications and separations should be based on CNS/ATM capability and not simply geography.

1.6 With this in mind at SEACG/18, IATA was tasked by ICAO to develop a concept of Operations for the provision of CNS/ATM.

1.7 IATA presented WP 22 to ATM/AIS/SAR/SG/21 that proposed “The Future APAC Airspace Concept of Operations”

1.8 ICAO requested IATA present a similar paper to CNS/MET/SG/15

2. DISCUSSION

2.1 The Concept of Operations, which was intended as a planning tool for ANSP and airlines. The Concept was not intended to compel States, although this framework was expected to be followed unless there were compelling reasons to do otherwise. The Concept was likely to be iterative, although it was written in a generic fashion to minimize the need for updates.

2.2 At ATM/AIS/SAR/SG/21 Hong Kong, China asked about the apparent incongruity with the Asia/Pacific Regional PBN Plan, in terms of the suggested navigation specifications and what was already in the Regional PBN Plan. It was explained that the Concept of Operations was a longer-term objective than the Regional PBN Plan milestones, and in any case the PBN Plan would need updating to incorporate the new PBN specifications expected in 2012. It was further noted that the table of navigation standards for each MTF was just an example of application, and the table did not form part of the Concept of Operations itself.

2.3 The Sub-Group meeting agreed to the following Draft Conclusion:

Draft Conclusion SG 21/8 – Asia/Pacific Air Navigation Concept of Operations

That, the Asia/Pacific Air Navigation Concept of Operations be included on the APAC website as guidance for State air navigation service facility and airline equipage planning, and States be advised of the Concept of Operations accordingly.

2.5 Draft Asia/Pacific Air Navigation Concept of Operations

The following principles supporting an APAC Concept of Operations are intended to be the 'default' operations environment so that States can specify expected facilities and standards in accordance with a specified timeframe, so airlines could plan for the appropriate equipage.

- The delivery of CNS/ATM services should be based primarily on the CNS/ATM capability. It is understood that a transition period for the enablement of capabilities and or enhancements may be necessary.
- **Flight Information Regions:** FIR boundaries should not limit the delivery of surveillance separation services (this requires Letters of Agreement and data sharing to facilitate seamless Transfer of Control). Where possible the number of FIRs should be minimized particularly along traffic flows. FIRs should not necessarily be based strictly on the boundaries of sovereign territories.
- **Special Use Airspace:** SUA should only be established¹ after due consideration of the impact on civil air traffic, and must be regularly reviewed by the appropriate State Airspace Authority to ensure that it is:
 - o being used for the purpose that it was established;
 - o being used regularly;
 - o as small as possible; and
 - o activated only when it is being utilised in accordance with the Flexible Use Airspace concept.
- **Communication:** areas where VHF (Very High Frequency) communications are not possible must be provided with a minimum communications services based on CPDLC (Controller Pilot Datalink Communications) capability, backed up by HF (High Frequency) or SATVOICE (Satellite Voice Communications).
- **Navigation:** air-routes above FL195 and within terminal controlled airspace (CTA and CTR) associated with major international aerodrome must be PBN based with an appropriate specification determined by the Airspace Authority (such as enroute RNP2, terminal RNP1/0.3) based on the GANP and the Regional Navigation Strategy.
- **Surveillance:** in areas where the provision of direct ATS surveillance is possible, ATC separation must be based on these surveillance systems (i.e. radar, multilateration and ADS-B). In areas where direct surveillance is not possible, ADS-C surveillance (and associated CPDLC capability) must be enabled providing reduced horizontal separations (i.e. RNP4 30/30 and planning for RNP2).
- Establishing equipage mandates requiring operators to equip with a specific technology is an acceptable concept provided the timeline for compliance is developed after due consultation and the benefits in equipage are clearly identified and agreed².

¹ Restricted areas must not be established over the high seas or over waters of undetermined sovereignty (reference: Annex 11 definition of restricted areas).

² Examples of this concept are the ADS-B mandate established by Australia, and those being established by Hong Kong China and Singapore.

- **Safety Nets:** powered aeroplanes operating above FL195 and within terminal controlled airspace (CTA and CTR) associated with major international aerodrome must have an operable mode S transponder, ACAS (airborne collision avoidance system), and the ATS surveillance systems must be fitted with STCA (Short Term Conflict Alert) and MSAW (Minimum Safe Altitude Warning) system), and the ATS surveillance systems must be fitted with STCA (Short Term Conflict Alert) and MSAW (Minimum Safe Altitude Warning).
- **Priority:** in each case where a minimum aircraft equipage is specified for this Concept, any aircraft that does not meet these requirements should receive a lower priority, except where prescribed (such as for State aircraft). States should require State aircraft to conform with the Concept of Operations wherever possible.
- **ATM Systems:** ATM system design should enable appropriate ATC capabilities including Conflict Prediction and Resolution (CPAR), AIDC (ATS Interfacility Datalink Communications), and A/D-MAN (Arrival/Departure Management).
- **ATFM:** flow management requirements to enhance capacity should be implemented for all major traffic flows and major aerodrome terminal operations, using bi-lateral and multi-lateral agreements, as well as CDM (Collaborative Decision-Making) procedures.

The APAC Concept of Operations should be applied against the Major Traffic Flows identified in the GANP (Global Air Navigation Plan). The following table is not part of the Concept of Operations itself but is an example of how concepts could be applied with the expectation that the navigation specification would deliver appropriate separation standards.

Areas (AR)	Homogeneous ATM areas/ Major Traffic Flows/Routes	Operational Concept
AR1	Asia/Australia and Africa	RNP4 based on ADS-C/CPDLC and planned RNP 2
AR2	Asia (Indonesia north to China, Japan and the Republic of Korea), Australia/New Zealand	RNAV5/RNAV2 based on direct surveillance/ VHF and planned RNAV1/RNP2
AR3	Asia and Europe via north of the Himalayas	RNAV5/RNAV2 based on direct surveillance/ VHF and planned RNAV1/RNP2
AR4	Asia and Europe via south of the Himalayas	Combination of: • RNP4 based on ADS-C/CPDLC and planned RNP 2 • RNAV5/RNAV2 based on direct surveillance/ VHF and planned RNAV1/RNP2
AR5	Asia and North America via the Russian Far East and the Polar Tracks via the Arctic Ocean and Siberia	RNP4 based on ADS-C/CPDLC and planned RNP 2

AR6	Asia and North America via the Central and North Pacific	RNP4 based on ADS-C/CPDLC and planned RNP 2
AR7	New Zealand/Australia and South America	RNP4 based on ADS-C/CPDLC and planned RNP 2
AR8	Australia/New Zealand, the South Pacific Islands and North America	RNP4 based on ADS-C/CPDLC and planned RNP 2
AR9	South-East Asia and China, Republic of Korea, and Japan	RNAV5/RNAV2 based on direct surveillance/ VHF and planned RNAV1/RNP2

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) Note the adoption of the Concept of Operations by ATM/AIS/SAR/SG/21 and draft conclusion; and

b) Consider similar action by CNS/MET/SG/15 to strengthen support for the Concept to APANPIRG 22
