

MODE S CONSPICUITY CODE – AMENDMENT TO eANP Vol II

Working Paper 18

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Presented by Co-Chair of SURICG

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Problem Nowadays

1. In APAC region, allocation of Mode 3/A (or SSR) codes is based on the **SSR CODES ALLOCATION PLAN in Vol II of the APAC Electronic Air Navigation Plan (eANP)**.
2. It provides each FIR with a range of codes for International or Domestic use. The objective is to minimize possibility of two or more flights being assigned the same Mode 3/A code.
3. However, it is a well-known fact that the availability of Mode 3/A codes is limited. Only 4096 Mode 3/A codes are available.
4. With increasing number of flights, limited number of discrete Mode 3/A codes will mean more likelihood of the same code being assigned to multiple aircraft in the airspace, increasing risk of mis-identification of flight and incorrect coupling of the flight plan.

Mode S Technology

Available for Resolving the Problem

1. Mode S radar, and associated ATM systems, provides an opportunity to move away from using discrete Mode 3/A codes for aircraft identification.
2. We can make use of aircraft identification provided by the aircraft through Mode S interrogation to identify the aircraft and to support coupling of radar tracks to flight plans.
3. The Surveillance Strategy for Asia/Pacific Region, adopted by APANPIRG/27 includes:
“Make full use of aircraft Mode S capabilities where suitable surveillance systems are available to reduce reliance on 4-digit octal code”

Mode S Implementation in APAC Seamless ATM Plan

1. The Asia/Pacific Seamless ATM Plan V2.0 states:

7.40 All Category S upper controlled airspace, and Category T airspace supporting high density city pairs and wholly served by Mode S SSR and/or ADS-B surveillance should implement the use of a standard non-discrete Mode A code for Mode S transponder equipped aircraft to reduce the reliance on assignment of discrete Mode A SSR codes reduce the incidences of code bin exhaustion and duplication of code assignment.

2. It is noted that no “standard non-discrete Mode A code” has yet been nominated for Asia/Pacific region.

What is a Mode S Conspicuity Code?

1. Mode S Conspicuity Code is:

A standard and non-discrete Mode 3/A code to tell the ATM systems NOT to make use of Mode 3/A code to identify the aircraft and couple the radar tracks with flight plan.

Instead, the ATM systems should make of the Mode S interrogated information, such as aircraft identification or ICAO 24-bit aircraft address, to identify the aircraft and couple the flight plans.

Situation of Mode S Implementation in Asia/Pacific Region

1. Mode S radars are deployed across the region. However, it is expected that many states will continue to rely on Mode A/C radars for a number of years to come.
2. Any meaningful use of a Mode S conspicuity code by a state, or coordinated across multiple states, requires a full Mode S radar environment, aircraft being Mode S capable, and compatible ATM system capabilities.
3. Use of a non-discrete conspicuity code for aircraft identification is not generally compatible with a Mode A/C surveillance environment.
4. Mode S equipage mandate is not essential for use of Mode S conspicuity code, but is preferred as States are gradually move to Mode S implementation.

Situation of Mode S Implementation in Asia/Pacific Region

1. The proposal to nominate a Mode S conspicuity code for this region will not obligate states to abandon the Mode A/C usage of its radars and implement the use of this code to replace discrete Mode 3/A codes.
2. At this stage, it is intended to reserve such code for future use, and encourage the use of it, as Mode S radars and compatible ATM system capabilities gradually increase.

Choice of Mode S Conspicuity Code

1. In theory, any Mode 3/A code, as long as agreed by the region, is feasible.
2. SEACG/23 meeting in March 2016 was informed of the India's trial implementation of Mode S for aircraft operating between specified city pairs. The conspicuity code used in the India's trial was "1000".
3. The European has identified use of the Mode S Conspicuity Code "1000" for such purpose.
4. It is proposed the Asia Pacific region will adopt the same Mode S Conspicuity Code "1000".
5. Selection of the same code in Asia Pacific will be a further step towards a seamless ATM environment for aircraft operating between Europe and Asia Pacific.

Changes Required to Materialize Code “1000” as Mode S Conspicuity Code

1. The code “1000” is currently used in the following FIRs according to the APAC eANP:
 - a) Bangkok (Domestic)
 - b) Brisbane (International)
 - c) Fukuoka (Domestic)
 - d) Shanghi (Domestic)
 - e) Shenyang (Domestic)
 - f) Taipei (Domestic)
 - g) Urumqi (Domestic)
2. It is proposed that code “1000” be removed from these specific FIR allocations.

Changes Required to Materialize Code “1000” as Mode S Conspicuity Code

Amend header of the table allocating SSR codes as follows:

- Add “1000”
- Amend “1000 – 1077” as “1001 – 1077”

**TABLE ATM II-APAC-2 SSR CODES ALLOCATION PLAN OF THE
ASIA AND PACIFIC REGIONS**

FIR	0001- 0077	0100- 0177	0200- 0277	0300- 0377	0400- 0477	0500- 0577	0600- 0677	0700- 0777	1000 1077	1001- 1077	1100- 1177	1200- 1277	1300- 1377	1400- 1477	1500- 1577	1600- 1677	1700- 1777
BANGKOK								I		D	D	D	D	D			
BEIJING	I						D										
BRISBANE				14	14					I	I	I					
CHENNAI			D				I										
COLOMBO																	
DHAKA																	
DELHI			D			I											
FUKUOKA					D					D	D	D	D	D	D		D
GUANGZHOU							D										
HANOI																	I
HO CHI MINH																	
HONG KONG, CHINA																	
INCHEON			D	D												D	
JAKARTA																	D
KABUL																	

Changes Required to Materialize Code “1000” as Mode S Conspicuity Code

1. Add the following new para. 3.6 to the Table ATM II APAC-2, SSR Codes Allocation Plan:

“3.6 Mode A Code A1000 is reserved for use as a conspicuity code for Mode S equipped aircraft, operating in airspace under Mode S radar surveillance, where Aircraft Identification (Flight ID) is used to enable coupling of ATS surveillance system information with the flight plan, and unambiguous ATC identification of aircraft.”

Draft Conclusion

The following draft Conclusion, **reviewed and supported by SURICG and CNS Sub-group**, is proposed for the consideration of the meeting:

Draft Conclusion/Decision ATM/SG/6-X: Proposed Air Navigation Plan Volume II Amendment	
What: That, an amendment as proposed in WP/XX to the Asia and Pacific Regions (APAC) Air Navigation Plan Volume II to identify Mode A code A1000 as the Mode S conspicuity code for the APAC Regions.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Reserve this SSR code for future use as the non-discrete Mode S conspicuity code.	Follow-up: ☐ Required from States
When: 3-Aug-18	Status: Draft to be adopted by Subgroup
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	



Thank You