



*International Civil Aviation Organization*

**Fourth Meeting of the ICAO Asia/Pacific Seamless ATM Planning Group  
(APSAPG/4)**

Hong Kong, China, 3 – 7 June 2013

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**Agenda Item 4: Asia/Pacific Seamless ATM Status and Strategies**

**SEAMLESS ATM ASSESSMENT SURVEY**

(Presented by Secretariat)

**SUMMARY**

This paper presents the results of the Seamless ATM Survey, which was conducted to provide information on the status of various factors, including Aviation System Block Upgrade (ASBU) elements, within the Asia/Pacific Region.

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-2 Reduced vertical separation minima
- 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-14 Runway operations
- GPI-16 Decision support systems and alerting systems
- GPI-17 Data link applications
- GPI-18 Aeronautical information
- GPI-21 Navigation systems
- GPI-22 Communication infrastructure

**1. INTRODUCTION**

1.1 The APSAPG is required by its Terms of Reference (TOR) to determine the current status of APAC administration’s Seamless ATM capability, including the identification of gaps affecting harmonization and interoperability

**2. DISCUSSION**

Survey Results

2.1 Based on a survey conducted, the results were collated into a Seamless ATM Assessment spreadsheet, in order to provide an overall measure of assessment and for comparison. The quantification of answers was achieved by using a simple word picture assessment process. In this connection, the information also provided valuable information on capability and planning that assisted the early drafting of the Asia/Pacific Seamless ATM Plan itself. The results are updated as and when information is received from states on the latest status. A copy of the latest iteration of the Seamless ATM Assessment Sheet is appended at **Attachment A**.

2.2 It is recognized that the information in the Assessment Sheet will need to be updated periodically as States continue to develop their capabilities. States are therefore urged to assist ICAO to keep the information current by providing regular updates.

**3. ACTION BY THE MEETING**

3.1 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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Seamless ATM Assessment Sheet

Seamless ATM Implementation	ASBU Block 0 elements (18)																	State Totals	Gl. Plan CERT	APAC Concept of Ops			Regional Elements (7)			State Totals	
	B0-05	B0-10	B0-15	B0-20	B0-25	B0-30	B0-35	B0-40	B0-65	B0-70	B0-75	B0-80	B0-84	B0-85	B0-86	B0-101	B0-102			B0-105	FIR	NAV	SUR	APT	ACCESS		DAT
United States	2	2	2	2	2	1	2	2	2	0	1	2	2	2	1	2	2	2	31	2	0	2	2	2	2	1	11
New Zealand	1	2	1	1	2	1	1	2	2	1	2	1	2	0	1	2	2	2	26	2	2	2	2	2	2	0	12
Australia	1	2	0	1	2	0	2	2	2	1	2	2	2	2	1	2	2	2	28	1	2	1	2	2	2	2	12
Hong Kong, China	1	1	1	1	1	1	1	2	1	1	1	1	1	2	2	1	1	2	22	2	1	2	2	2	1	1	11
Singapore	2	2	1	1	0	1	1	2	2	1	2	1	2	2	0	2	2	2	26	2	2	1	2	2	2	2	13
Republic of Korea	2	2	0	1	2	1	1	2	2	1	2	0	2	0	2	2	2	2	26	2	2	1	2	2	0	0	9
Fiji	1	2	0	0	2	0	0	2	1	1	0	0	1	2	1	2	1	2	18	2	2	1	0	2	2	2	11
Japan	2	2	0	1	2	1	2	2	2	1	2	0	2	0	0	2	1	2	24	2	2	1	2	2	1	0	10
India	2	2	1	1	1	1	1	2	1	1	2	1	2	0	1	2	2	2	25	2	2	1	2	1	1	0	9
Thailand	0	1	1	0	0	0	1	2	0	1	2	1	2	2	2	2	1	2	20	1	2	1	2	1	2	0	9
China	1	0	2	1	2	0	0	2	2	2	2	1	0	0	2	2	2	2	23	2	1	1	2	0	2	0	8
Malaysia	0	2	1	0	1	0	1	2	0	1	2	0	2	0	0	2	2	2	18	2	0	1	2	0	0	0	5
Indonesia	1	0	0	0	1	0	1	2	0	1	0	0	2	0	0	2	2	0	12	1	2	1	2	0	0	2	8
Myanmar	1	1	0	1	0	1	1	1	0	1	0	0	0	0	0	2	2	0	11	2	2	0	2	1	1	0	8
Philippines	1	2	0	1	0	0	1	0	2	1	0	0	0	0	0	0	0	0	8	2	0	1	0	2	0	0	5
Afghanistan	0	0	0	0	0	1	1	0	0	1	0	0	2	2	0	1	0	0	8	1	0	1	1	1	0	0	4
Bangladesh	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2	0	1	1	1	1	1	0	5
Maldives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	2	0	7
French Polynesia	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Cambodia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DPR Korea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lao PDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mongolia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nauru	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nepal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pakistan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Papua New Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sri Lanka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Viet Nam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Element Total</b>	<b>18</b>	<b>23</b>	<b>10</b>	<b>12</b>	<b>20</b>	<b>9</b>	<b>17</b>	<b>29</b>	<b>19</b>	<b>17</b>	<b>20</b>	<b>10</b>	<b>24</b>	<b>14</b>	<b>13</b>	<b>29</b>	<b>24</b>	<b>24</b>		<b>28</b>	<b>25</b>	<b>20</b>	<b>30</b>	<b>23</b>	<b>21</b>	<b>10</b>	
<b>APAC %</b>	<b>31%</b>	<b>39%</b>	<b>17%</b>	<b>20%</b>	<b>34%</b>	<b>15%</b>	<b>29%</b>	<b>49%</b>	<b>32%</b>	<b>29%</b>	<b>34%</b>	<b>17%</b>	<b>41%</b>	<b>24%</b>	<b>22%</b>	<b>49%</b>	<b>41%</b>	<b>41%</b>		<b>48%</b>	<b>43%</b>	<b>34%</b>	<b>51%</b>	<b>39%</b>	<b>36%</b>	<b>17%</b>	

Seamless ATM Implementation	Civ/Mil Elements (10)		% Military SUA	SUA Review	International SUA	Integrated ATM	Joint Aids Aerodromes	Shared Data	Common training	Common procedures	State CM Total	State Grand Total		
	Body	Liaison										Value	%	
United States	2	2	1	1	2	1	2	2	2	2	17	59	84%	United States
New Zealand	0	2	2	2	2	2	2	2	2	2	18	56	80%	New Zealand
Australia	2	1	2	2	0	1	2	2	2	2	16	56	80%	Australia
Hong Kong, China	2	2	2	2	2	2	2	2	2	2	20	53	76%	Hong Kong, China
Singapore	2	2	2	0	0	0	2	1	2	2	13	52	74%	Singapore
Republic of Korea	2	2	0	2	0	2	2	2	2	2	16	51	73%	Republic of Korea
Fiji	2	2	2	2	2	2	2	2	2	2	20	49	70%	Fiji
Japan	1	2	2	1	0	2	2	0	2	2	14	48	69%	Japan
India	0	2	0	2	2	0	2	2	0	2	12	46	66%	India
Thailand	2	2	0	2	2	1	2	2	0	0	13	42	60%	Thailand
China	2	1	0	0	2	1	2	1	0	2	11	42	60%	China
Malaysia	2	2	1	0	0	1	2	2	2	2	14	37	53%	Malaysia
Indonesia	0	2	2	0	2	0	0	1	1	1	9	29	41%	Indonesia
Myanmar	1	2	1	1	2	0	0	0	0	1	8	27	39%	Myanmar
Philippines	2	2	2	0	2	0	0	1	2	2	13	26	37%	Philippines
Afghanistan	2	2	0	0	2	1	2	2	0	2	13	25	36%	Afghanistan
Bangladesh	0	1	0	1	2	0	0	0	1	1	6	13	19%	Bangladesh
Maldives	0	0	0	0	0	0	0	0	0	0	0	7	10%	Maldives
French Polynesia	0	0	0	0	0	0	0	0	0	0	0	4	6%	French Polynesia
Cambodia	0	0	0	0	0	0	0	0	0	0	0	0	0%	Cambodia
DPR Korea	0	0	0	0	0	0	0	0	0	0	0	0	0%	DPR Korea
Lao PDR	0	0	0	0	0	0	0	0	0	0	0	0	0%	Lao PDR
Mongolia	0	0	0	0	0	0	0	0	0	0	0	0	0%	Mongolia
Nauru	0	0	0	0	0	0	0	0	0	0	0	0	0%	Nauru
Nepal	0	0	0	0	0	0	0	0	0	0	0	0	0%	Nepal
Pakistan	0	0	0	0	0	0	0	0	0	0	0	0	0%	Pakistan
Papua New Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0%	Papua New Guinea
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0	0%	Solomon Islands
Sri Lanka	0	0	0	0	0	0	0	0	0	0	0	0	0%	Sri Lanka
Viet Nam	0	0	0	0	0	0	0	0	0	0	0	0	0%	Viet Nam
<b>Element Total</b>	<b>24</b>	<b>31</b>	<b>19</b>	<b>18</b>	<b>24</b>	<b>16</b>	<b>26</b>	<b>24</b>	<b>22</b>	<b>29</b>				
<b>APAC %</b>	<b>41%</b>	<b>53%</b>	<b>32%</b>	<b>31%</b>	<b>41%</b>	<b>27%</b>	<b>44%</b>	<b>41%</b>	<b>37%</b>	<b>49%</b>				

Element Values*	0. Non-ASBU/Seamless ATM activity	1. Initial development supporting ASBU/Seamless	2. Mature system supporting ASBU/Seamless ATM
B0-05 CDO	Use of conventional stepped arrival procedures	STAR with flexible PBN procedures or ATS surveillance-based procedures	STAR arrivals to CDO or OPD
B0-10 FUA	SUA is not subject to FUA (such as activation by NOTAM)	Partial flexibility of controlled or special use airspace	FUA principles apply to controlled and special use airspace or not applicable
B0-15 AMAN-DMAN	No formal runway sequencing management	Basic runway sequencing procedures	Electronic, integrated AMAN/DMAN tools in use
B0-20 CCO	Use of conventional departure procedures	Flexible PBN or surveillance-based procedures in use to RNAV SID	CCO PBN procedures with RNAV SID
B0-25 AIDC	ATS messages conducted by voice and/or AFTN	AIDC testing	Full AIDC operational deployment
B0-30 AIS-AIM-	Partial Phase 1 AIM transition	Phase 1 and 2 AIM transition	Phase 1 and 2 and partial Phase 3 AIM transition
B0-35 ATFM	No formal ATFM activity	Basic ATFM, no automated decision support tools	Collaborative ATFM with automated support tools
B0-40 ADS-C, CPDLC	ADS-C, CPDLC not used in oceanic/remote airspace	Either ADS-C or CPDLC used for oceanic airspace	Not applicable, or ADS-C, CPDLC and HF/SATVOICE
B0-65 PBN	Approach procedures with no vertical guidance	Approach procedures with vertical guidance	PBN approach procedures with vertical guidance
B0-70 WAKE	Applied minima more conservative than PANS ATM	Application of pre-2012 wake separation minima	Application of new 2012 wake turbulence minima
B0-75 SMS	No electronic surface movements surveillance	Electronic surface movements surveillance	ASMGS and cockpit moving map in operation or not applicable
B0-80 CDM	No formal airport CDM	Basic airport CDM in use	Integrated airport CDM, automated data exchange
B0-84 ADS-B, MLAT	No ADS-B or MLAT ground-based surveillance where possible	ADS-B trial or provided as an add-on to MLAT	Where appropriate, ADS-B ATS surveillance is provided, or is not applicable
B0-85 ATSA	No ADS-B aircraft requirements	ADS-B Out aircraft mandate in law	ADS-B Out mandate, certain aircraft require ADS-B In
B0-86 ITP	No use of ITP in oceanic or remote airspace	ITP trial planned or in progress	Not applicable, or ITP approved for use
B0-101 ACAS	No specific aircraft safety net requirements	ACAS I required	ACAS II required for certain aircraft (TAWS)
B0-102 NET	No ATM safety nets in use	Partial implementation of ATM safety nets, mode S	Mode S, MSAW, STCA and where appropriate, CPAR
AD CERT	No State aerodrome certification rules	Aerodrome certification, not covering all four GPI elements	Aerodrome certification covering all four areas
AD WARN	No formal aerodrome status warnings	Basic non-digital aerodrome warnings	Full digital, integrated aerodrome warnings service
FIR	More than two FIRs and ACCs, no rationalisation	Rationalisation of FIR boundaries or ACCs planned	Cross-FIRB ATC services, amalgamation of FIRs/ACCs or not applicable
NAV	No PBN ATS route or airspace structure	Partial PBN airspace/route structure, RNAV specifications	PBN airspace/route structure
SUR	Limited or nil ATS surveillance where possible to deploy	Use of procedural systems monitored by ATS surveillance	Use of ATS surveillance based ATC minima
APT	No formal airport capacity analysis	Airport runway capacity analysis undertaken (AAR)	Comprehensive capacity analysis for aircraft and passenger movements to support ATFM
ACCESS	Procedural FLAS within ATS surveillance coverage	Limited FLAS used only for specified occasions	No procedural FLAS
DAT	No data sharing between Area Control Centres	FIRB and inter-ACC ATS surveillance data sharing	ATS surveillance and ATM systems data sharing or not applicable
CM BODY	No formal body to coordinate civil-military activities is in place	Civil-military meetings are held to discuss strategic issues	A formal civil-military body is in place to manage strategic CM matters or not applicable
LIAISON	No formal civil-military liaison takes place for tactical responses	Civil-military tactical liaison is in place for special events	Permanent civil-military liaison positions are in place in relevant ATC Centres or not applicable
% MILITARY SUA	30% or more of airspace is military special use airspace	15-29% of of airspace is military special use airspace	Less than 15% of airspace is military special use airspace or not applicable
SUA REVIEW	Special use airspace is not regularly reviewed for use, size, etc.	SUA is regularly reviewed but not by an independent body (not airspace users)	SUA is regularly reviewed by an independent body or not applicable
INTERNATIONAL SUA	Restricted and/or prohibited areas are designated in international waters	Military danger areas are designated in international waters	Military danger areas are designated in international waters, clear of ATS routes or not applicable
INTEGRATED ATM	No integration of civil and military ATM systems	Partial integration of civil and military ATM systems	Full integration of civil - military ATM systems (including common procurement) or not applicable
JOINT AIDS, ADS	Not civil-military joint provision of navigation aids or aerodromes	Joint provision of some navigation aids	Joint provision of some navigation aids and aerodromes or not applicable
SHARED DATA	No ATS surveillance data is shared between civil and military ATM units	Civil ATS surveillance data is shared with military ATM units	Military ATS data (filtered as required) is shared with civil ATM units or not applicable
COMMON TRAINING	Common training is not conducted between civil and military ATM units	Common training is conducted for special events	Common training is conducted for all civil-military matters or not applicable
COMMON PROCED'S	Civil and military ATM units have minimal common procedures	Civil and military ATM units have common procedures for special events	Civil and military units have common procedures for all relevant liaison or not applicable

\*Applied to international aerodromes, airspace and ATS routes