International Civil Aviation Organization

Europe – Asia Trans-Regional Special Coordination Meeting

Beijing, China, 23 – 25 September 2013

Agenda Item 2: Asia/Pacific Seamless ATM Plan

SEAMLESS ATM PLANNING

(Presented by the Secretariat)

SUMMARY

This paper presents information on the Asia/Pacific Seamless ATM Plan, and its concomitant implementation guidance material.

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-6   Air traffic flow management
GPI-7   Dynamic and flexible ATS route management
GPI-8   Collaborative airspace design and management
GPI-10 Terminal area design and management
GPI-12 Functional integration of ground systems with airborne systems
GPI-13 Aerodrome design and management
GPI-16 Decision support systems and alerting systems
GPI-18 Aeronautical information
GPI-19 Meteorological Systems
GPI-22 Communication infrastructure

1. **INTRODUCTION**

1.1   The objective of the Asia/Pacific Seamless Air Traffic Management (ATM) Plan was to facilitate Asia/Pacific Seamless ATM operations, by developing and deploying ATM solutions capable of ensuring safety and efficiency of air transport throughout the Asia/Pacific region. The Plan provided a framework for a transition to a Seamless ATM environment by establishing an expectation of harmonised and interoperable systems, in order to meet future performance requirements.

1.2   In this regard, the Aviation System Block Upgrades (ASBU) had been incorporated into the Seamless ATM Plan, although there were a number of additional regional elements in the Plan that were not covered by ASBU. These included elements in the human performance and civil/military cooperation fields.

1.3　　　　The Twenty Fourth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/24, 24-26 June 2013) endorsed Version 1.0 of the Seamless ATM Plan. In this regard, APANPIRG adopted the following Conclusions and Decision:

Conclusion 24/54: Asia/Pacific Seamless ATM Plan

*That, the Asia/Pacific Seamless ATM Plan Version 1.0 attached as **Appendix B to the Report on Agenda Item 3.6** be endorsed, and made available on the ICAO Asia/Pacific Regional Office web site.*

Conclusion 24/55: State Seamless ATM Planning

That, given the urgency and priority of Seamless ATM planning for the Asia/Pacific as acknowledged by the 46th Conference of Directors General of Civil Aviation (DGCA, Osaka, Japan, 12-16 October 2009) and APANPIRG/22 (05-09 September 2011), States should be urged to:

a) *review Version 1.0 of the Asia/Pacific Seamless ATM Plan and utilise the Plan to develop planning for State implementation of applicable Seamless ATM elements;*

b) *ensure relevant decision-makers are briefed on the Seamless ATM Plan;*

c) *submit the first Regional Seamless ATM Reporting Form to the ICAO Regional Office by 01 March 2014; and*

d) *where possible, participate and contribute to Seamless ATM system collaborative training and research initiatives.*

Decision 24/56: Seamless ATM Seminars/Workshops

That, ICAO be urged to facilitate Asia/Pacific Seamless ATM Planning and Implementation Seminars/ Workshops for Asia/Pacific and trans-regional States.

1.4　　　　APANPIRG/24 discussed the critical strategies necessary to ensure that States were able to conduct planning to successfully implement applicable Seamless ATM Plan elements:

3.6.45　　　The Secretariat presented a basic guide to the implementation of the Seamless ATM PARS and PASL elements.　The meeting noted that the PARS and PASL Phase commencement dates were aspirational targets, and should not be treated like a hard date such as the implementation of Reduced Vertical Separation Minimum (RVSM) or FPL 2012.　In these cases, there was a potential major regional problem if all States did not implement at the same time by the specific agreed date, which was clearly not the case for the start of PARS/PASL Phase I or II.

3.6.46　　　In that regard, APSAPG noted that although it would be ideal if all States achieved capability on day one of Phase I, this was probably not realistic.　The Phase dates were chosen as being an achievable target for the majority of States.　However the dates were not designed to accommodate the least capable State, otherwise the region as a whole would fall behind the necessary urgent ATM improvements required by the Director's General of Civil Aviation and APANPIRG.

3.6.47　　　In considering the planning necessary before the PARS/PASL Phase dates, the meeting noted that it was important to ensure everyone in the planning process was aware that the necessary groundwork and capability building must take place as a priority, and that full operational capability by Phase date commencement was a secondary consideration.　ICAO expected that it was possible a number of States would be working towards implementation during the Phase, in an effort to implement as soon as possible.

3.6.48   APSAPG/4 discussed the need for each State to verify the applicability of PARS and PASL by analysis of safety, current and forecast traffic demand, efficiency, predictability, cost effectiveness and environment to meet expectations of stakeholders prior to implementation. The PARS/PASL elements would be either:

a)   not applicable; or

b)   already implemented; or

c)   not implemented yet.

3.6.49   The Secretariat had developed draft Seamless ATM Implementation Guidance, which provided a basic process with customised steps for each PARS/PASL element, and derived from this Matrix, a State Seamless ATM Plan Template. This material was designed to assist States but was not mandatory in nature, and would continue to be developed with input from States and International Organizations after APSAPG/4.

3.6.50   APANPIRG agreed that the implementation guidance material would provide useful assistance to States, but needed review and input from experts, therefore it would not be attached to the Seamless ATM Plan itself. The guidance material would be provided on the Regional Office's web site near the Seamless ATM Plan and updated as the material matured with State input.

3.6.51   A Regional Seamless ATM Reporting Form had also been drafted to assist States reporting their progress to the Regional Office. APSAPG provided input into the format of the reporting to assist the finalization of material by ICAO, noting that it was intended that States report by 01 March 2014 to indicate Seamless ATM planning progress to APANPIRG contributory bodies.

3.6.52   Australia were concerned that the reporting was not a duplication of the global Air Navigation Reporting Form (ANRF) process. APANPIRG noted that the regional implementation reporting was not intended to replace the ANRF, and had a quite different function as it was focused on change management aspects of specific Seamless ATM elements (many of which were not in the ASBU).

2.   DISCUSSION

Implementation

2.1   Version 1.0 of the Asia/Pacific Seamless ATM Plan is available on the web site at: http://www.icao.int/APAC/Documents/edocs/Asia%20Pacific%20Seamless%20ATM%20Plan%20V1.0.pdf

2.2   On the ICAO Asia/Pacific Regional Office web site there is also information on Seamless ATM implementation guidance, as well as a progress reporting form.

2.3   A presentation on implementation matters is appended to this paper as **Attachment A**.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to:

a) note the information contained in this paper; and

b) discuss how to support the Seamless ATM effort trans-regionally between the European and Asian Regions.

………………………….

Implementing Seamless ATM

Len Wicks
Regional Officer ATM, ICAO Asia/Pacific Office

Europe – Asia Trans-regional Special Coordination Meeting

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Introduction

- Presentation Outline

  - Introduction

  - Asia/Pacific Seamless ATM Plan

  - Implementation Guidance Material

  - Reporting

  - Conclusion

Introduction

- The main objective of this presentation is to provide an insight into Asia/Pacific Seamless Air Traffic Management (ATM) planning, which will affect other regions!

- What is the purpose of 'Seamless ATM'?

    - *The objective of Seamless ATM is the safe and interoperable provision of harmonized and consistent air traffic management service provided to a flight, appropriate to the airspace category and free of transitions due to a change in the air navigation service provider or Flight Information Region.*

        (Asia/Pacific Seamless ATM Planning Group, APSAPG)

Asia/Pacific Seamless ATM Plan

- Historically, States and ANSPs have developed their own infrastructure tailored only to suit their own national needs, and some Air Navigation Service Providers (ANSPs) did not operate within a business-like environment.

- There was no means of the Asia/Pacific undertaking a European or North American type of ATM modernisation programme like SESAR or NextGen.

- However, the Asia/Pacific aimed to make huge strides in safety and efficiency, simply by addressing the organisational and human performance issues that prevent optimal ATM, even with the current systems.

Asia/Pacific Seamless ATM Plan

- The 46th DGCA conference (Japan, 2009) committed to a Seamless ATM Asia/Pacific by issuing the *Kansai Statement*.

- APANPIRG formed the APSAPG to develop a Seamless ATM Plan.

- The facility-orientated ICAO Aviation System Block Upgrade (ASBUs) were only a part of the solution, which also needed to cover:

  - human performance; and

  - civil/military cooperation aspects.

- The Seamless ATM Plan was intended to determine the minimum requirements for seamless gate-to-gate ATM operations – an efficiency focus for passengers and aircraft.

Asia/Pacific Seamless ATM Plan

- Although the Asia/Pacific is currently the world's busiest air traffic region, the Middle East, Africa and South America were also experiencing a dramatic growth of traffic; thus ATM problems were not confined to the Asia/Pacific.

- It would appear that a form of Seamless ATM Planning also needs to be implemented in other busy regions to provide the capacity and improved services necessary to cope with growth.

- In addition, the Asia/Pacific neighbours the AFI, MID, EUR, NAM and SAM regions, so it was important that trans-regional aspects of seamless planning were considered.

Asia/Pacific Seamless ATM Plan

Europe – Asia/Pacific Trans-Regional Issues

- Limited number of entry/exit points on the Mongolian-Chinese Flight Information Region Boundaries (FIRBs).

- Restrictions on ATS route development (entry/exit waypoints) between China-Mongolia-DPRK .

- OLDI (On-Line Data Interchange) to AIDC (ATS Inter-facility Data Communications) lack of interoperability.

- Differences in horizontal separation (early 2013: Russia 16NM, Mongolia 80NM - ATS surveillance data-sharing possible?).

- Afghanistan-Pakistan airspace military restrictions and Flight Level Allocation Scheme (FLAS) affecting Central Asian routes.

Implementation Guidance Material

- Phase 1 Seamless Elements (12 November 2015, 1st Priority)

Seamless ATM Plan reference, paragraph	Aerodrome	Terminal	En-route	Specification title	ASBU traceability Block 0	APAC Priority
80 (7.27)		√	√	Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	B0-NOPS	1
140 (7.9)			√	Performance-based Navigation (PBN) Routes	B0-FRTO	1
180 (7.7)		√	√	ADS-B OUT	B0-ASUR	1
220 (7.35)		√	√	ATS Inter-facility Data-link Communications (AIDC)	B0-FICE	1
270 (7.32)	√	√	√	Multi-sensor integrated surveillance (ADS-B, MLAT, radar)	B0-ASUR	1
280 (7.33)		√	√	ADS-C, CPDLC	B0-TBO	1
360 (7.11)		√	√	Civil Military use of SUA (FUA)	B0-FRTO	1
90 (7.3)		√		Continuous Descent Operations (CDO)	B0-CDO	2*
100 (7.3)		√		Continuous Climb Operations (CCO)	B0-CCO	2*
110 (7.5)		√		Performance-based Navigation (PBN) Approach	B0-APTA	2*
*ICAO HQ affords a high priority to this item						

Note 1: Priority 1 = critical upgrade, Priority 2 = recommended upgrade, Priority 3 = may not be universally implemented.

Note 2: Priority 3 includes - B0-WAKE (Enhanced Wake Turbulence Separations), B0-SURF: (Improved Runway Safety), B0-OPFL: Climb/Descent Procedures using ADS-B In-trail Procedure (ITP). B0-WAKE is not included in the Seamless ATM Plan Phase 1 and 2 as there are no current standards.

Implementation Guidance Material

- Phase 1 Seamless Elements (12 November 2015, 2nd Priority)

Seamless ATM Plan reference, paragraph	Aerodrome	Terminal	En-route	Specification title	ASBU traceability Block 0	APAC Priority
50 (7.25)	√	√		Arrival Manager/Departure Management (AMAN/DMAN)	B0-RSEQ	2
70 (7.2)	√			Airport Collaborative Decision-Making (ACDM)	B0-ACDM	2
120 (7.4)		√		Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	B0-CCO/CDO	2
170 (7.7)		√	√	Airborne Safety Systems	B0-ACAS	2
250 (7.37)	√	√	√	ATM systems enabling optimal PBN/ATC operations	B0-APTA	2
290 (7.33)	√	√	√	UPR and DARP	B0-FRTO	2
300 (7.38)	√	√	√	Aeronautical Information Management	B0-DATM	2
310 (7.26, 39)	√	√	√	Meteorological Information	B0-AMET	2

Implementation Guidance Material

- ## Phase 1 Seamless Elements (12 November 2015, 3rd Priority)

Seamless ATM Plan reference, paragraph	Aerodrome	Terminal	En-route	Specification title	ASBU traceability Block 0	APAC Priority
40 (7.1)	√			Safety and Efficiency of Surface Operations (A-SMGCS)	B0-SURF	3
10 (7.1)	√			Apron Management	Regional	-
20 (7.1)	√	√		ATM-Aerodrome Coordination	Regional	-
30 (7.1)	√			Aerodrome capacity	Regional	-
150 (7.8)			√	Performance-based Navigation (PBN) Airspace	Regional	-
190 (7.28)			√	Airspace classification	Regional	-
200 (7.10)			√	Flight Level Orientation Scheme (FLOS)	Regional	-
210 (7.36, 40)			√	Flight Level Allocation Schemes (FLAS)	Regional	-
230 (7.29)	√	√	√	Automated Transfer of Control in an ATSU	Regional	-
240 (7.34)		√	√	ATS Surveillance data sharing	Regional	-
260 (7.30)	√	√	√	ATC Horizontal separation	Regional	-
320 (7.41)	√	√	√	ATM Managers' human performance	Regional	-
330 (7.41)	√	√	√	ATC simulators performance	Regional	-
340 (7.41)	√	√	√	Safety assessment of human performance changes	Regional	-
350 (7.41)	√	√	√	ATM Operators' human performance	Regional	-
370 (7.42)		√	√	Strategic Civil Military coordination	Regional	-
380 (7.42)		√	√	Tactical Civil Military coordination	Regional	-
390 (7.42)	√	√	√	Civil Military system integration	Regional	-
400 (7.42)	√	√	√	Civil Military navaids joint provision	Regional	-
410 (7.42)	√	√	√	Civil Military common training	Regional	-
420 (7.42)	√	√	√	Civil Military common procedures	Regional	-

Implementation Guidance Material

- Phase 2 Seamless Elements (08 November 2018, 1st Priority)

Seamless ATM Plan reference, paragraph	Aerodrome	Terminal	En-route	Specification title	ASBU traceability Block 0	APAC Priority
80 (7.47)		√	√	Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	B0-NOPS	1
140 (7.22)			√	Performance-based Navigation (PBN) Routes	B0-FRTO	1
180 (7.23, 24)		√	√	ADS-B OUT	B0-ASUR	1
300 (7.51)	√	√	√	Aeronautical Information Management	B0-DATM	1
110 (7.14, 16)		√		Performance-based Navigation (PBN) Approach	B0-APTA	2*
120 (7.15)		√		Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	B0-CCO/CDO	2*
*ICAO HQ affords a high priority to this item						

Implementation Guidance Material

- Phase 2 Seamless Elements (08 November 2018, 2nd Priority)

Seamless ATM Plan reference, paragraph	Aerodrome	Terminal	En-route	Specification title	ASBU traceability Block 0	APAC Priority
50 (7.45)	√	√		Arrival Manager/Departure Management (AMAN/DMAN)	B0-RSEQ	2
160 (7.52, 54)		√	√	Safety Nets	B0-SNET	2
170 (7.21)		√	√	Airborne Safety Systems	B0-ACAS	2
250 (7.43, 53)	√	√	√	ATM systems enabling optimal PBN/ATC operations	B0-APTA	2
30 (7.13)	√			Aerodrome capacity	Regional	-
60 (7.44, 50)		√	√	ATC Sector Capacity	Regional	-
130 (7.19)		√		Performance-based Navigation (PBN) Visual and Arrival Procedures	Regional	-
230 (7.46)	√	√	√	Automated Transfer of Control in an ATSU	Regional	-
240 (7.48)		√	√	ATS Surveillance data sharing	Regional	-
320 (7.55)	√	√	√	ATM Managers' Performance	Regional	-

Implementation Guidance Material

- The Regional Office has developed a set of guidance material that is informal in nature– that is, it has not been formally endorsed by APANPIRG… but in any case it may be of value to States given the need to start the implementation planning.

- The Seamless ATM Plan and informal Guidance Material is available on the Regional Office web site, under 'APAC eDocuments' at http://www.icao.int/APAC/Pages/edocs.aspx.

Seamless ATM Plan

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Asia/Pacific Seamless ATM Plan	version 1, June 2013
Seamless ATM Implementation *Informal* Guidance	version 4.0, June 2013
State Seamless ATM Implementation Plan Template - (MS Word)	
Regional Seamless ATM Reporting Form - (MS Excel)	
Template for comments – Implementation Guidance - (MS Excel)	

Implementation Guidance Material

- In the early planning for effective implementation of Seamless ATM, there were three key areas of focus, that required a close engagement with:

  - <u>top decision-makers and regional bodies</u> to ensure that Seamless ATM Planning was supported politically, and resourced appropriately;

  - <u>military agencies</u> to establish enhanced civil/military cooperation; and

  - <u>ATS managers, staff and unions</u>, to ensure all parties understood the benefits of Seamless ATM to Air Navigations Service Providers (ANSPs) and those actually delivering the services.

Implementation Guidance Material

- Top decision-makers and regional bodies need to know the economic and environmental imperatives to prioritise Seamless ATM planning-

    - *IATA's economic analysis indicated that if Asia Pacific States do not implement the critical ASBU elements of the Seamless ATM Draft Plan, aviation's contribution to the Regional GDP would fall from today's **2.2%** to **0.81%** by 2030.*

    - US Economic Cost-Benefit Analysis
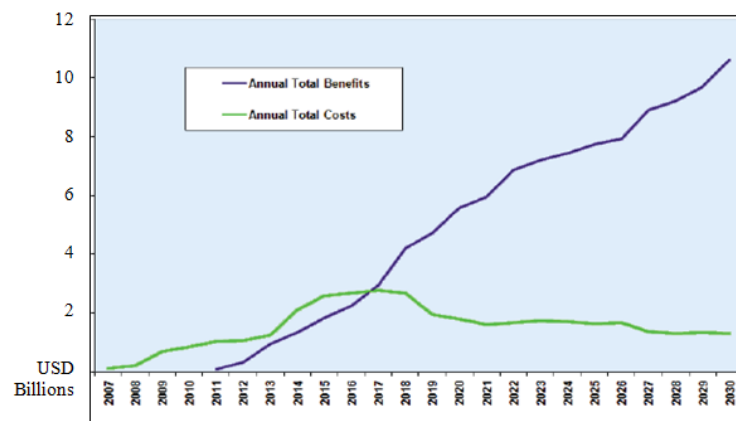
- Engagement by the military was necessary to convey the message that supporting the civil aviation air navigation structure protected the vital economies of the region, so was consistent with defence missions.

Implementation Guidance Material

- Seamless ATM is designed to improve ATC tools and ensure harmonised and interoperable systems with a clear focus on human performance; thus it would be beneficial to managers and staff in delivering services.

- The promotion of ATS surveillance-based separations instead of procedural standards should reduce ATC workload; however…

  ANSPs need to train controllers to use ATS surveillance in an optimal manner, such as the application of positive control techniques when the spacing between aircraft reduced towards minimum separation.

- An important factor will be the application of 'Just Culture' and an open ('no blame') reporting culture, so that human error was managed in a modern context.

Reporting

- A reporting process detailing Seamless ATM planning and implementation progress was vital for:

  - global and regional planning – this contributes to possible future amendments to the Seamless ATM Plan, regional initiatives, and even the Global Air Navigation Plan;

  - planning of neighbouring States and affected airlines; and

  - State goal-setting, performance measurement and internal consultation.

Conclusion

- ICAO seeks high level political support that in the medium and long term may mean a much closer integration of systems where possible, if the Seamless ATM Plan was to ultimately succeed.

- There would be little to gain from a bold and visionary plan if there was a lack of political support for collaboration in areas such as research and system design, enhancement of CNS systems, reduction of airspace and ATM complexity, and civil/military cooperation.

- States, ANSPs and aircraft operators (civil and military) all need to start Seamless ATM Planning now, in order to align objectives and milestones with other States in the region.

- Without effective regional Seamless ATM implementation, there will be a significant economic and environmental penalty, as well as safety implications.

Questions

THE FOURTH MEETING OF
THE ICAO ASIA/PACIFIC SEAMLESS ATM PLANNING GROUP
(APSAPG/4)
Hong Kong, China, 3 - 7 June 2013