SAM/IG/1
WP/06
04/01/08
Revised
27/03/08

International Civil Aviation Organization
South American Regional Office

FIRST WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP (SAM/IG/1)
REGIONAL PROJECT RLA/06/901

Lima, Peru, 21 to 25 April 2008

Agenda Item 1: **Optimization of the ATS route structure in terminal and en-route airspace and implementation of performance-based navigation (PBN) in the SAM Region**.

ACTION PLAN FOR THE IMPLEMENTATION OF RNAV/RNP FOR TERMINAL AREA AND APPROACH OPERATIONS

(Presented by the Secretariat)

Summary

This paper contains a model action plan for the implementation of PBN for terminal area and approach operations.

References:

- Report of the GREPECAS/14 meeting
- Report of the AP/ATM/13 meeting

1 Background

1.1 The AP/ATM/13 meeting, upon discussing this matter, and in order to begin PBN implementation, formulated Conclusion AP/ATM/13/05 National PBN implementation plans, requesting States to develop their national PBN implementation plans, taking into account the dates foreseen in the CAR/SAM PBN roadmap.

2 Discussion

2.1 In order to provide the States with guidance on this matter, ICAO, together with the GREPECAS PBN Task Force, developed model national implementation plans for terminal area and approach operations.

2.2 The model action plans for terminal area and approach operations which appear in **Appendices A** and **B**, respectively, to this working paper, may be used as guidelines by the national PBN implementation groups in SAM States.

3 Suggested action

3.1 The meeting is invited to:

a) Take note of the information provided in this working paper;

b) Review and, if applicable, amend the model action plans for PBN implementation in terminal areas and approach operations shown in Appendices A and B; and

c) Complete the corresponding action plan for PBN implementation in the en-route phase, setting start-up and completion dates for each activity.

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APPENDIX A

PBN TMA and Approach Action Plan GPI 5, 7, 8, 10, 11, 12			
	Start	**End**	**Responsible party**
1 Airspace structure			
1.1 Identify SID/STARs/RNAV TMA that will be implemented in a short term			
1.2 Identify improvements to SID and/or STARS procedures, as per t he main traffic flows in TMA			
1.3 Analyse aircraft fleet navigation capacity operating in the TMA			
1.4 Develop an airspace structure for TMA, including SIDs/STARs and RNAV approach procedures			
2 Prepare Cost-Benefit analysis			
2.1 Prepare preliminary Cost-Benefit analysis			
2.2 Prepare final Cost-Benefit analysis			
3. Airspace Safety assessment			
3.1 Develop a TMA safety assessment model, if necessary			
3.2 Prepare a data collection programme for airspace safety assessment			
3.3 Prepare preliminary airspace safety assessment			
3.4 Prepare final airspace safety assessment			
4 Establish collaboration in decision-making (CDM) process			
4.1 Coordinate implementation needs with ATS users, aircraft operators and military authorities			

PBN TMA and Approach Action Plan GPI 5, 7, 8, 10, 11, 12			
	Start	**End**	**Responsible party**
4.2 Establish implementation dates			
4.3 Establish the format of documentation of the CAR/SAM RNAV/RNP website			
4.4 Report implementation progress to the corresponding ICAO Regional Office			
5. ATC automated systems			
5.1 Assess impact of PBN implementation in ATC automated systems			
5.2 Implement the necessary changes in ATC automated changes			
6 Aircraft and operator approval			
6.1 Be aware of the national implementation programme and of the required navigation specifications			
6.2 Analyse aircraft approval requirements, crews and operators requirements for en-route navigation specifications (terminal/approach areas) as established in PBN manual			
6.3 Publish process of operational approval			
6.4 Aircraft and operators approval (for each type of procedures and specification)			
6.5 Establish and keep up to date a registry of approved aircraft and operators			
6.6. Verify the operation within the continuous monitoring plan (aircraft and procedures)			
7. Standards and procedures			
7.1 Assess the regulations on the use of GNSS, and if such were the case, proceed to its publication			
7.2 Prepare and publish AIC reporting PBN implementation planning			

PBN TMA and Approach Action Plan GPI 5, 7, 8, 10, 11, 12			
	Start	**End**	**Responsible party**
7.3 Publish AIP Supplement containing applicable standards and procedures			
7.4 Review the operational model of ATS units involved			
7.5 Verification/Flight inspection for publication of SIDs and STARs, etc.			
7.6 Update letters of operational agreement between ATS units			
8 Training			
8.1 Develop programme and documentation for pilot training			
8.2 Develop programme and documentation for air traffic controllers and AIS operators			
8.3 Provide training programme (pilots, air traffic controllers, AIS operators, etc.)			
8.4 Hold seminars oriented to operators indicating the plans and operational and economical benefits expected			
9. Decision for implementation			
9.1 Evaluate operational documentation availability (ATS, OPS/AIR)			
9.2 Evaluate approved aircraft and operations (compliance of the % operations established - see 6.4)			
9.3 Implement regional improvements (RNAV, RNP, WGS-84, etc).			
9.4 Publish "trigger" NOTAM			

PBN TMA and Approach Action Plan GPI 5, 7, 8, 10, 11, 12			
	Start	**End**	**Responsible party**
10. System Performance Monitoring			
10.1 Develop post-implementation TMA operations monitoring programme			
10.2 Execute post-implementation TMA operations monitoring programme			
Pre operational implementation date			
Definitive implementation date			

APPENDIX B

PBN APP Action Plan GPI 1, 12, 16, 21, 23			
	Start Date	**End Date**	**Remarks**
1. Airspace structure			
1.1. Analyse aircraft fleet capacity operating in selected airport.			
1.2 Evaluate existing infrastructure to determine the needs for adequacy to PBN concepts Analysis of aircraft fleet navigation capacity operating in the TMA			
1.3 Develop APP procedures based in PBN concepts.			
1.4 Use the existing radar vectorial guidance patterns as a basis for the design of trajectories for arrivals and departures.			
1.5 coordinate new procedures with users.			
2. Prepare Cost-benefit analysis			
2.1 Prepare Preliminary Cost-Benefit analysis			
2.2 Prepare Final Cost-Benefit analysis			
3. Airspace safety assessment			
3.1 Develop safety assessment model for TMA, if necessary			
3.2 Prepare data collection programme for airspace safety assessment			
3.3 Prepare preliminary airspace safety assessment			
3.4 Prepare final airspace safety assessment			

PBN APP Action Plan GPI 1, 12, 16, 21, 23			
	Start Date	**End Date**	**Remarks**
3.5 Determine and carry out ATC simulations, as necessary			
4. Establish collaboration decision making (CDM) process			
4.1 Coordinate implementation need s with ATS users, aircraft operators and military authorities			
4.2 Establish implementation date			
4.3 Establish the documentation format of CAR/SAM RNAV/RNP Website			
4.4 Report implementation progress to the corresponding Regional Office			
5 ATC automated systems			
5.1 Evaluate PBN implementation impact in the ATC Automated Systems			
5.2 Implement the necessary changes in the ATC Automated Systems			
6 Aircraft and operator approval			
6.1 Acknowledge the national implementation programme and required navigation specifications			
6.2 Analyse aircraft approval, crews and operators for routes specifications (terminal areas/approach) as established within the PBN manual framework.			
6.3 Publish operational approval process.			
6.4 Approval of aircraft and operators (for each type of procedure and specification)			
6.5 Establish and keep updated a record of approved aircraft and operators record			

PBN APP Action Plan GPI 1, 12, 16, 21, 23			
	Start Date	**End Date**	**Remarks**
6.6 Verify operation within the continuous monitoring programme (aircraft and procedures)			
7 Standards and procedures			
7.1 Assess the regulations on the use of GNSS and if such were the case, proceed to its publication.			
7.2 Prepare and publish AIC reporting PBN implementation planning			
7.3 Publish AIP supplement containing applicable standards and procedures			
7.4 Review operational model of ATS units involved			
7.5 Verification/Flight inspection for publication of APP procedures.			
7.6 Update letters of operational agreement between ATS units			
8. Procedures design			
8.1 Development or approach RNP procedures			
8.2 Coordinate new procedures with users			
9 Training			
9.1 Develop a training programme and documentation for pilots			
9.2 Develop training programme and documentation for Air Traffic Controllers and AIS Operators			
9.3 Conduct training programmes (pilots, air traffic controllers, AIS operators)			

PBN APP Action Plan GPI 1, 12, 16, 21, 23			
	Start Date	**End Date**	**Remarks**
9.4 Hold seminars oriented to operators, indicating the plans and the operational and financial benefits expected			
10 Implementation decision			
10.1 Evaluate operational documentation availability (ATS, OPS/AIR)			
10.2 Evaluate approved aircraft and operations (compliance of the % operations established - see 6.4)			
10.3 Implement regional improvements (RNAV, RNP, WGS-84, etc).			
10.4 Publish "trigger" NOTAM			
11. System Performance Monitoring			
11.1 Develop post-implementation APP operations monitoring programme			
11.2 Execute post-implementation APP operations monitoring programme			
Pre operational implementation date			
Definitive implementation date			