European and North Atlantic Office

EANPG PROGRAMME COORDINATING GROUP (COG) PERFORMANCE BASED NAVIGATION IMPLEMENTATION TASK FORCE (PBN TF)

FIFTH MEETING

(Paris, France, 23 to 24 May 2011)

SUMMARY OF DISCUSSIONS OF THE ICAO EUR PERFORMANCE BASED NAVIGATION TASK FORCE FOURTH MEETING

(Presented by the Secretariat, in support of Strategic Objectives A and C)

SUMMARY

This information paper presents the Summary of Discussions of the ICAO EUR PBN TF/4 Meeting which was held in Paris from 30 November to 1 December 2010.

1. Action by the Meeting

1.1 The PBN TF is invited to:

a) The PBN TF is invited to comment on the information given in the Summary of Discussions of the PBN TF/4 Meeting.

SUMMARY OF DISCUSSIONS

ICAO EUR PERFORMANCE BASED NAVIGATION TASK FORCE

(EUR PBN TF)

FOURTH MEETING

(Paris, 30 November – 1 December 2010)

2. Introduction

2.1 The Fourth Meeting of the ICAO EUR PBN TF was convened from 30 November to 1 December 2010 in the EUR/NAT Office of ICAO in Paris, France.

2.2 The Meeting was chaired by Mr. Thomas Buchanan (Switzerland) and Mr. Elkhan Nahmadov from the European and North Atlantic (EUR/NAT) Office of ICAO was the Secretary, assisted by Mr. Sven Halle and Ms. Catherine Daly from the same Office. Lists of participants and contacts are provided at **Appendix A** and **Appendix B**. A list of documentation submitted to the Meeting is provided at **Appendix C**.

2.3 In the opening session the PBN TF was informed that Pierre Sohier (Belgium) and Frank Lumnitzer (IFALPA) had sent their apologies informing that they would not be able to attend the meeting.

2.4 The following agenda was adopted:

Agenda Item 1:	**Review of the latest developments, incl global ICAO PBN programme, EANPG and COG updates and status of PBN implementation in other ICAO regions**
Agenda Item 2:	**Status of PBN implementation progress in the EUR region**
Agenda Item 3:	**Development of the EUR regional guidance material to foster APV implementation**
Agenda Item 4:	**Organization of an APV implementation workshop in 2011**
Agenda Item 5:	**Any Other Business**

3. Review of the latest developments

EANPG and COG updates

3.1 Under this agenda item the PBN TF was presented with the EANPG and COG discussions and conclusions related to PBN. In particular, the decision of COG/47 to re-establish the EUR PBN TF as a partial follow-up of the EUR APV workshop (25-26 May 2010) was noted. It was recalled that the workshop had resulted in several recommendations that the COG agreed as requiring the review by the EUR PBN TF.

3.2 The outcome of the workshop was presented and reviewed by the PBN TF. It was agreed that the issues identified would be dealt with by the PBN TF in the course of the drafting of the regional APV implementation guidance material that the EANPG COG had tasked the PBN TF to develop. Some of the issues would be discussed at the EUR APV implementation workshop that is scheduled to take place in May 2011. It was noted that some of the issues were being addressed by various ICAO global panels or groups and that the PBN TF members would keep track of these discussions. In particular, the recommendation of the workshop in 2011 to review the need for APV II was noted. In this regard, it was recalled that references to APV II were in Annex 10 and it was agreed to recommend the ICAO NSP to consider their removal.

Global ICAO update

3.3 The PBN TF was provided with an update on PBN initiatives being worked on or coordinated by the ICAO PBN Programme Office in Montreal. The update concerned any policy decisions, implementation support such as Go-Teams, workshop courses, recent outcomes of Panels, Study groups and taskforces on work related to PBN and any new publications.

3.4 It was noted that the 37th Assembly adopted a new Assembly resolution on PBN (A37-11) that replaced Assembly resolution A36-23. The main difference between the old and new Resolution was that Aerodromes that have no APV equipped aircraft operating on their runways were exempted from establishing APV procedures but could opt for LNAV, however it is necessary for Aerodromes to have at least LNAV procedures. The new Resolution r*esolves* that:

a) States complete a PBN implementation plan as a matter of urgency to achieve:

1) implementation of RNAV and RNP operations (where required) for en route and terminal areas according to established timelines and intermediate milestones;

2) implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS), including LNAV only minima for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016 with intermediate milestones as follows: 30 per cent by 2010, 70 per cent by 2014; and

3) implementation of straight-in LNAV only procedures, as an exception to 2) above, for instrument runways at aerodromes where there is no local altimeter setting available and where there are no aircraft suitably equipped for APV operations with a maximum certificated take-off mass of 5 700 kg or more.

3.5 The progress of the Go-Team was presented. The Go-Team is undertaking activities to assist States in PBN implementation with a target of addressing 1 to 2 States per ICAO Region. States that are selected need to have a political will for implementation and are relatively advanced in PBN implementation. Such States could then serve as regional pockets of knowledge and expertise in their region. So far, the Go-Team carried out one visit to Thailand at the end of August this year. After a pre-assessment of the PBN implementation gaps, a team formed by ICAO, IATA and industry partners carried out an on-site visit. It is envisaged that the recommendations will result in an enhanced implementation plan and a detailed project plan in 6 months which will cover a three-year implementation path. The next Go-Team visit is tentatively planned for mid January 2011 in the United Arab Emirates.

3.6 Four workshops were performed in 2010. These workshops were all supported by EUROCONTROL and FAA. Four more workshops were planned during 2011. The objective of these workshops is to familiarize participants with airspace design as it relates to the implementation of Performance Based Navigation. The workshops have proven to be very successful and provide States and airspace designers with a hands-on exercise in developing the airspace. To ensure availability in the future, ICAO is developing an airspace design workshop, based on the EUROCONTROL/FAA workshop. A train-the-trainer course is planned in February 2011. In this respect it was noted that 2 of the PBN Airspace design workshops would be held in the ICAO EUR Region in 2011. Dates and venues being subject for further confirmation, but the first workshop is provisionally scheduled in July 2011 in Ukraine and the second in November 2011 in Paris.

Operational Approval

3.7 In a cooperative effort with ICAO COSCAP-SEA and the Australian CASA, a PBN OPS approval handbook has been developed. Based on this document, ICAO is developing guidance for global application. The way forward is to expand the PBN manual with high level guidance on PBN ops approval and to develop a detailed guidance material that can also be used as technical reference material for further training courses. A consultant has been hired by ICAO and material is expected to be finalized by the end of the year. The following deliverables are expected:

a) An update of the PBN Manual (Doc 9613) to include additional text addressing Operational Approval Guidance. All changes should be kept at a high level consistent with the rest of the Manual.

b) Additional guidance material to the PBN Manual for consideration by the PBNSG. The guidance material may take multiple and different forms e.g., web-based, list of FAQs, Handbooks.

c) Training Courses for PBN ops approval:

i) Background to PBN as a foundation course covering aircraft, ops, airspace, ATS – as common across the various disciplines (e.g., see web based training packages);

ii) Detailed courses for individuals and organizations with general qualifications in the associated discipline, plus prerequisite knowledge of PBN having completed a foundation level course.

d) ICAO will set up CDO courses to be available in the 2nd Half of 2011.

PBN implementation in other ICAO Regions

3.8 The PBN TF noted that the CAR/SAM States developed a regional PBN Airspace Concept that will be implemented in three phases as follows:

Stage	Operational improvement
Stage I (2010 - 2011)	<u>Review of ATS route network in the CAR Region</u> • Gathering data on aircraft PBN capacity • Review CNS infrastructure • Realignment and implementation of new RNAV routes in the upper airspace based on RNAV 5 • Implementation of RNAV routes in the lower airspace based on RNAV 1, RNAV 2 and RNP 1, as required • Implementation of approach procedures PBN APV (BARO-VNAV) in accordance with Assembly Resolution A36-23
Stage II (2011 - 2012)	<u>Review and interface of the ATS routes network in the CAR/SAM Regions</u> • Realignment and implementation of new RNAV routes in the interface of the upper airspace between the CAR and SAM Regions, based on RNAV 5 or RNAV 2, as applicable • Implementation of CDO in international airports, as required
Stage III (2012 - 2014)	• Elimination of conventional ATS routes in the upper and lower airspace, as required • Implementation of random routes, by airspace altitude stratum • Review of the upper airspace configuration • Review of the lower airspace configuration • Implementation of flexible use of airspace (FUA) • Implementation of dynamic ATS route management

3.9 Similarly, the PBN TF noted the progress of PBN implementation in the ASIAPAC Region and the associated APANPIRG Conclusions. In particular the development of the Operational Approval Handbook that provides additional guidance on PBN Operational Approval requirements for ASIAPAC States was noted.

3.10 The PBN TF was presented with a summary of Performance-Based Navigation (PBN) implementation plans in the United States (U.S.) National Airspace System (NAS). The presentation also addressed the role of Satellite Based Augmentation System (SBAS) as a sensor input to PBN and notes recently updated and newly published U.S. guidance material for PBN.

3.11 In particular it was noted that the FAA had recently published updated guidance material for PBN implementation:

- FAA Order 8260.54A (Dec 2007) *United States Standard for RNAV Procedures* provides procedure design guidance for RNAV approaches (equivalent ICAO RNP APCH).
- FAA Advisory Circular 90-105 (Jan 2009) *Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System* provides airworthiness and operational approval guidance for the conduct of baro-VNAV RNP approaches with LNAV/VNAV minima, Basic-RNP 1 SIDs and STARs.

3.12 It was noted that the FAA made all its guidance documents available at http://rgl.faa.gov

3.13 It was noted that the FAA plans recognize the need to quickly evolve procedural design and deployment to produce greater benefits. In FY 2011 and beyond, FAA will build on the successful introduction of PBN operations in the NAS through a continuous improvement process to optimize PBN procedures. Close collaboration between the FAA and aviation community, through forums such as RTCA and the PARC, as well as close coordination between the FAA's air traffic and flight standards organizations will ensure success.

3.14 The meeting noted however that the institutional situation in the USA (i.e. one single major provider of Air Navigation Services – FAA) is very different from what happens in the European Union (i.e. several ANS Providers, certifiable also for single "unbundled" services and each of them taking its own business decisions).

4. Status of PBN implementation in the EUR region

Status of PBN in the EUR Region

4.1 The PBN TF noted that with the aim of assessing the readiness of States in the ICAO EUR Region to comply with the provisions of Assembly Resolution 36-23, EANPG/51 (1-3 December 2009) endorsed Conclusion 51/17 urging States to provide information on the status of their national PBN implementation planning. A questionnaire was circulated to ICAO EUR States on 15 January 2010 (EUR/NAT 10-28.TEC). The PBN TF was presented with a summary of States' responses to the foregoing letter combined with information provided via the Eurocontrol LSSIP programme and with the assistance of the Eurocontrol RNAV Approaches Task Force (RATF).

4.2 It was noted that EANPG/52 had agreed to circulate this information to States with a request to confirm or update it. It was noted that information available from the next round of LSSIP 2011 update will be also provided to the PBN TF to compile a total picture of PBN implementation in the ICAO EUR Region. It was agreed that the State letter requesting this information would differentiate between PBN in en-route and terminal airspace plans and APV implementation plans. This would allow the granting of a clearer view on the status of APV planning and implementation.

4.3 The PBN TF was provided with presentations on the status of national PBN planning and implementation in France, Switzerland and the United Kingdom. It was agreed that the exchange of this information was very useful to share experience and lessons learnt and encouraged States and service providers to regularly provide such updates at the PBN TF meetings and workshops.

4.4 It was also noted that States, service providers and airspace users were developing various PBN promotion/education (leaflets/brochures) material in support of the PBN implementation. It was agreed that sharing of this material would be beneficial to all and should be encouraged.

4.5 The PBN TF had specifically noted that the PBN implementation was a multidisciplinary programme requiring involvement and commitment of all parties. Therefore it had strongly supported the EANPG Conclusion urging States to establish multidisciplinary groups to advance PBN planning and implementation.

4.6 The PBN TF noted that any material presented had demonstrated that there was still a lack of knowledge and understanding of the overall PBN concept, which as a result hindered the progress of PBN implementation. Therefore, it was agreed that a continuous education and promotion campaign was required. It was agreed that the series of PBN related workshops planned in 2011 in the ICAO EUR Region would help to address this issue.

4.7 The PBN TF agreed that more detailed information from airspace users on their needs and timelines was essential to the success of PBN planning and implementation. In this respect, it was agreed that information on current and future equipage plans as collected by Eurocontrol and IATA was crucial in PBN planning and requested that this information be made available to the PBN TF.

Advanced RNP

4.8 The PBN TF was presented with the progress of work on advanced RNP in support of the emerging and future operational needs and possible EU IR provided by Eurocontrol.

4.9 In particular the PBN TF noted the case for the advanced RNP, its scope and benefits in supporting the emerging ATM concepts. It was noted that the Industry Consultation Body (ICB) recommended the EC that the development of a Performance Based Navigation (PBN) Implementing Rule (IR) for Required Navigation Performance (RNP) should be mandated in recognition of ICAO resolutions to the widely and timely implementation of PBN. The meeting however concurred that, while advanced RNP will progressively bring benefits in the medium term, in the short term PBN implementation can be progressed based on the present state of the art.

REDII programme

4.10 The PBN TF was provided with a presentation by IATA on Regional Development and Implementation Initiative (REDII) in support of PBN. It was noted that the objectives of the REDII were to provide working level assistance to States in the development and implementation of their PBN plans. Each REDII initiative would have a clear set of objectives, timeline and deliverables. Resources to support these initiatives would come from industry stakeholders, ICAO, IATA and Eurocontrol to pool resources and expertise in order to deliver assistance to an ICAO EUR State that is lacking PBN progress and would ask/accept assistance.

4.11 The deliverables could be the development of the RNP APCH Procedures at a number of airports in the State, and demonstration and education for the State's CAA and national collaborative PBN implementation teams on the process and steps required for PBN implementation.

4.12 The PBN TF was informed that the regional REDII and global Go-Team programmes were complementing each other and targeting States with different levels of maturity of PBN planning and implementation and that IATA ensures coordination/coherence between these 2 programmes.

4.13 It was agreed that ICAO and IATA in cooperation with EASA and Eurocontrol should organise a couple of pilot projects in the EUR to demonstrate the benefits and capabilities.

Performance framework for PBN implementation

4.14 The PBN TF was presented with the draft EUR regional performance objectives to lead regional implementation of PBN in a structured manner and aligned with the Global Air Navigation Plan. The following 3 regional performance objectives and associated tasks were proposed **(Appendix D refers):**

a) Enhance capacity and efficiency of en-route airspace;

b) Enhance capacity and efficiency of terminal airspace; and

c) Enhance safety, capacity and efficiency at aerodromes.

4.15 The PBN TF agreed to review and follow internal coordination and provide further comments on the proposed performance framework by 1 January 2011. It was expected that the final product would be provided to the EANPG in coordination with the EANPG Performance Task Force.

Review of the EUR SUPPs proposal for amendment with regards to the flight planning provisions

4.16 The PBN TF was presented with the status of the proposal for amendment to the ICAO EUR Regional Supplementary Procedures (SUPPS) (Doc 7030) related to PBN. It was recalled that this amendment proposal was drafted by the 3rd Meeting of the ICAO PBN TF (6 October 2009). This proposal for amendment was then reviewed and endorsed by the 51st Meeting of the ICAO European Air Navigation Planning Group (EANPG) (1-3 December 2009) (Conclusion EANPG51/15 refers). In follow up to the EANPG Conclusion, the ICAO Secretariat had initiated a formal process for approval of the amendment. This process involves a consultation with the ICAO HQ to ensure that the proposal does not conflict with any global provisions and consequent circulation of the agreed proposal for amendment to all ICAO States and international organisations. This process ensures that the regional supplementary provisions as stipulated in Doc 7030 do not contradict or conflict with the ICAO global provisions, that there is an extensive globally coordinated consultation involving airspace users, regulators and service providers and the amendments proposed are understood and supported at global level. In line with this process the ICAO EUR/NAT Office has disseminated a State Letter (ref EUR/NAT 10-0505.TEC (NAE/HOI)) on 8 July 2010.

4.17 The PBN TF noted that the responses received indicated that the proposal for amendment was supported. However, there were some suggestions on how to improve the proposal. The majority of those suggestions were of editorial substance, but there were several concerns raised about para 2.1.2 of the proposal related to flight planning.

4.18 It was recalled that Para 2.1.2 was drafted in view of Amendment 1 to the 15th Edition of ICAO Doc 4444 that becomes applicable as of 15 November 2012. The concern raised was that with the approval of the current proposal for amendment, this particular paragraph might be interpreted as coming into effect immediately with approval of this proposal by the ICAO Council. This may create confusion among flight plan filers and receivers as to what requirements would apply and when.

4.19 Secondly, it was noted that the ICAO EUR FPL2012 Task Force was working on the overall review of the ICAO EUR SUPPS in light of Amendment 1 to Doc 4444. The concern raised was that there might be duplication work and potential conflict with the FPL TF work.

4.20 Therefore, it was agreed that para 2.1.2 of the amendment proposal should be removed and replaced by a note. The note would state that this particular paragraph on flight planning requirements will be revised as part of the overall Doc 7030 revision in connection with Amendment 1 to Doc 4444. Therefore, it was agreed that the amendment proposal as revised by PBN TF/4 (**Appendix E** refers) should be submitted for further approval through ICAO.

4.21 The PBN TF was also informed that EANPG/52 (23-25 November 2010) was presented with an amendment proposal developed by the EUR FPL2012 Task Force. The proposal contained the revised flight planning provisions taking Amendment 1 into account. The PBN TF was tasked by the EANPG to review the PBN related part of the proposal and comment as necessary. The PBN TF having reviewed the amendment proposal had agreed to reinstate the requirement with regards to RNAVINOP designator that was required to cater the needs of B-RNAV approved aircraft. It was also agreed to delete references to O1-O4 designators as those were related to RNP 1. It was agreed that the amendment proposal with the PBN TF revisions **(Appendix F refers)** would be forwarded to the EUR FPL TF for further processing in line with the EANPG conclusions.

EGNOS

4.22 The PBN TF was provided with the SBAS EGNOS status. It was noted that the system development and initial operational phase was successfully accomplished by ESA in March 2009 and that the EC has been managing the EGNOS Operational Phase since April 2009. EGNOS OS service was declared available in October 2009 and EGNOS certification for first pan-European GNSS Navigation Service Provider (NSP) was achieved in July 2010, according to SES Regulation. Some performance issues detected in August 2010 were debugged and fixed and EGNOS SoL service Declaration of Verification[1] (after a further performance assessment period) is currently planned for the beginning of 2011.

4.23 It was also noted that the ESSP is the certified EGNOS service provider and ESA is in charge of further system design enhancements and procurement.

4.24 In conclusion the PBN TF noted that LVP performance was already available over European land masses and the opportunity of exploiting available SBAS/EGNOS capabilities was available when designing APV procedures.

EASA AMC-20 material

4.25 The PBN TF was presented with an update on the status of AMC- 20 material by EASA. It was noted that the NPA for AMC 20-26 (Airworthiness Approval and Operational Criteria for RNP Authorisation Required (RNP AR) Operations) was published on 26 May 2008. Approximately 180 comments were received related to AMC 20-26 (RNP AR). A number of significant comments received were related to the display functionality and the use of LNAV during a missed approach. These comments have been addressed in the Comment Response Document (CRD) published in July 2009. The decision adopting the AMC 20-26 has been issued in December 2009. Manufacturers, air operators and ATSPs can therefore make use of the guidance contained therein, in order to plan and obtain approvals for the related operations.

4.26 Following the publication of NPA 2008-14, which also covered APV BARO-VNAV operations, approximately 130 comments were received related to AMC 20-27 (RNP APCH). These comments have been addressed in the CRD (July 2009). The decision adopting AMC 20-27 has been issued in December 2009.

4.27 The Agency has issued NPA 2009-04, proposing AMC 20-28 for RNAV GNSS approach operation to LVP minima using SBAS (i.e. EGNOS in the EU), on 23 March 2009. The CRD is currently planned by mid 2011 and the adoption of AMC 20-28 for the 4th quarter of 2011.

4.28 In reviewing the status of the AMC material, the PBN TF noted some strong concerns expressed by IATA and ICAO Member States. In particular, it was felt that the EASA AMCs in the current form created some difficulties in the aircraft certification or approval process that may preclude the fulfilment of PBN objectives at global level. With regards to AMC 20-26/AMC20-27, it was noted that these AMC may have introduced requirements that seem to be inconsistent with the certification requirements for

[1] DoV as required in the EU by Article 6 of SES Regulation 552/2004.

aircraft with similar capabilities in other parts of the world and the intent of the PBN Manual. Furthermore, AMC 20-28 was experiencing a considerable production delay and the envisaged publication date of 2011 will create more implementation difficulties.

4.29 In this regard, the PBN-TF invited EASA to consider the above-mentioned concerns raised on the need to accelerate the creation of the AMC 20-28 and the correction of AMC 20-27. Similarly, the PBN TF felt that additional clarification of certification of IFP Designers (or entities) on the basis of EC Reg. 73/2010 might be required (e.g. connection with the EASA regulatory processes). It was agreed that a letter would be drafted by IATA and Eurocontrol, in coordination with ICAO, in which the foregoing concerns would be addressed to EC/EASA.

5. Development of the EUR regional guidance material

5.1 The PBN TF was presented with a first draft of guidance material developed by Eurocontrol to support States in the implementation of APV as an input to the ICAO discussions and as a potential contribution to the development of ICAO EUR guidance material. Another paper was presented by EASA on regulatory aspects. The PBN TF thanked Eurocontrol and EASA for providing such useful input and agreed that the material presented would be merged and circulated to the PBN TF members for further comments and input. Eurocontrol agreed to take a lead on this work with the aim of producing a new version by the next meeting. It was noted that the COG AIM TF would provide input to this work from the procedures design perspective.

5.2 The PBN TF agreed that this guidance material should be applicable for the whole ICAO EUR Region taking sub-regional specificity into account at the same time as well as being aligned with ICAO global material. It was felt that the guidance material should address the main problems that States, their competent authorities, service providers and airspace users see as impeding the progress of APV. It was pointed out that the main hurdles in implementation were not technical, but more of a regulatory or management nature (culture change for all involved stakeholders) and therefore also related to the possible lack of global vision. It was agreed that the discussion at the APV workshop in May 2011 should be constructed in such a way as to help list and understand the above-mentioned problems which should be discussed, understood and finally addressed as part of the guidance material drafting process. EASA and EUROCONTROL committed to support said Workshop.

6. APV implementation workshop

6.1 The PBN TF agreed that the EUR APV workshop (in line with the EANPG decision) would be held on the week of 23 to 27 May 2011 and in combination with the next meeting of the PBN TF. The workshop would be preceded with one day breakout sessions where the more advanced States could share their experiences and lessons learnt with others. The precise schedule of the workshop and the PBN TF meeting will be circulated in the first quarter of 2011 by the ICAO EUR/NAT.

6.2 The PBN TF agreed on the following themes for the workshop:

a) Data handling and management, as mandated by EANPG/51;

b) Determining risks and planning mitigations to ensure successful implementation of ICAO Resolution 37/11;

c) Update on EC Implementing Rules (EASA, ADQ and PBN);

d) Round table discussions (interactive in groups).

6.3 The expected audience would include regulators, air navigation service providers, flight operations, designers and airports.

6.4 The ICAO EUR/NAT would circulate a questionnaire prior to the workshop in order to determine the potential scope and subject champions. The draft letter and questionnaire would be coordinated with the PBN TF before circulation.

6.5 In addition, it was noted that 2 PBN airspace design workshops would be organised in the EUR in coordination with Eurocontrol. One of the workshops was planned in the summer of 2011 in the eastern part of the region and another in November 2011 in Paris. In this regard, it was noted that assistance was required by States and airspace users to clarify the operational approval process. Ambiguity in this process was seen as one of the risk factors in the PBN implementation that needed to be mitigated.

6.6 It was agreed that this issue should be one of additional subjects to be discussed in cooperation with EASA and States in the ICAO EUR Region during the series of PBN workshops planned in 2011. It was noted that ICAO, EASA and Eurocontrol would further coordinate the planning of the workshops taking the foregoing recommendation into account. The workshops would also address implementation and certification issues and allow the exchange of experience and best practise.

7. AOB

Review of the GNSS Manual

7.1 The PBN TF was informed that ICAO was reviewing the ICAO GNSS Manual (Doc 9849) in order to address the GNSS implementation hurdles and remove duplication of the material contained in the PBN manual (Doc 9613). The PBN TF was invited to review the document and provide comments to ICAO by correspondence until the next meeting.

SBAS channel assignment mechanism

7.2 The PBN TF recalled that at its previous meeting there was an urgent need to establish a global or regional SBAS channel number allocation mechanism.

7.3 It was noted that EANPG/52 and TRASAS/3 had also acknowledged the need for a single SBAS channel number assignment solution and endorsed Conclusions inviting ICAO to establish a globally agreed mechanism that would meet this requirement.

7.4 The PBN TF was informed about the outcome of the ICAO NSP discussions in this respect. It was noted that the FAA was currently operating a tool that was meeting their needs and that Eurocontrol has obtained a block of addresses to meet the needs of the ICAO EUR Region in the interim period. However, it would be desirable for the global process to be established by ICAO.

7.5 The PBN TF noted that the NSP preferred scenario was as follows:

- Reasonable size blocks of channels are allocated by ICAO Headquarters to each regional office. This will be done on the basis of the tool developed by the FAA.
- Local ANSPs needing an assignment will need to coordinate the request at State Level.
- The State will bring the request to the ICAO regional office, if deemed appropriate.
- The ICAO Regional Office will assign channels to the requester and inform ICAO Headquarters.
- ICAO Headquarters will keep an up-to-date database of the status of SBAS channel assignments.

7.6 It was noted that the FAA further informed ICAO that it would be willing to provide some support to enable ICAO to put a new assignment process in place based on their global assignment tool. Accordingly, at the NSP meeting in November 2010, an FAA contractor briefed the GNSS Standards Sub-Group (GSSG) on a possible way of implementing the new process, and committed to providing to ICAO Headquarters a copy of a software tool that he had developed for that purpose.

7.7 In view of the above the PBN TF agreed to support the scenario presented by the NSP in the paragraph here-above but noted that splitting this rather simple process into several regional processes would overcomplicate the issue. It was recommended that there should be one single global process coordinated by ICAO. In order to support this, the PBN TF agreed to:

a) Offer its assistance to ICAO in drafting the concept of operations/procedure in support of the global SBAS channel assignment process; and

b) Invite ICAO to try the software tool in the ICAO EUR/NAT Office as soon as the tool was received from the FAA in order to test the process and tool until it becomes applicable at the global level.

Action list

7.8 The PBN TF agreed on the action list as provided at **Appendix G.**

Next meeting

7.9 The next meeting of the PBN TF will take place during the week of 23 to 27 May 2011 in Paris combined with the EUR APV workshop. The precise schedule will be circulated in the first quarter of 2011.

APPENDIX A

List of Participants

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APPENDIX B

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European and North Atlantic Office

PERFORMANCE BASED NAVIGATION IMPLEMENTATION TASK FORCE (PBN TF)
(Paris, 30 November to 1 December 2010)
Fourth Meeting
STATUS OF DOCUMENTATION

WP	Agenda Item	Title	Presented by
1		Agenda	Secretariat
2	4	Performance Based Navigation Implementation	Secretariat
3	8	Review of GNSS Manual (Doc 9849)	Secretariat
4	2	Performance-Based Navigation – The Implementation Challenge	Secretariat
5 Rev	4	Proposal for Amendment to ICAO EUR Supps (Doc 7030)	Secretariat
6	2	PBN Implementation	Secretariat
7	4	SBAS Channel Assignment Process	Secretariat
8 Rev 1	1	EASA Vision on Certifications and Approvals for PBN Operations	EASA
9	5	Draft Guidance Material for the Implementation of RNP APCH Operations	Eurocontrol
		Commission Regulation (EU) N° 73/2010	EASA

List of information papers

IP	Agenda Item	Title	Presented by
1	3	Summary of Progress on Implementation of ASIA/Pacific Performance Based Navigation (PBN)	Secretariat
2	3	PBN Implementation in the NAM/CAR Regions	Secretariat
3	2	Status of Performance Based Navigation (PBN) Implementation in the United States	Secretariat
4	2	PBN Update	Secretariat
5	3	SBAS Equipage Status	Switzerland
6	3	WAAS Status Report	Switzerland
PPT01	1	Present Developments of Performance Based Navigation (PBN) in support of emerging ATM operational requirements	Eurocontrol
PPT02	6	APV Procedures Design Workshop	Secretariat
PPT03	4	Status of PBN Implementation in France	France
PPT04	8	SBAS/EGNOS Programme	Eurocontrol
PPT05	4	Status of PBN Implementation within the UK	United Kingdom
PPT06	4	PBN within the UK's Future Airspace System	United Kingdom
PPT07	4	PBN Regional Development Implementation Initiatives ICAO European Region Proposal	IATA

Appendix D

EUR REGIONAL PERFORMANCE OBJECTIVES

STRATEGIC OPERATIONAL IMPROVEMENT/ NATIONAL PERFORMANCE OBJECTIVE	
ENHANCE CAPACITY AND EFFICIENCY OF ENROUTE AIRSPACE	
Performance Benefits	
Safety	1. Safety level maintained or improved
Environment	1. Reduced emissions through shorter flights and use of optimum routes/trajectories
Capacity	1. Increased capacity through better utilization airspace resources
Cost effectiveness	1. Fuel cost reduction through availability of more optimized routes/trajectories; and 2. Ability of aircraft to conduct flight more closely to preferred trajectories
Performance Measurement	
Metrics	1. Number of PBN routes implemented
	2. Percent difference between optimal and actual route
	3. Number of aircraft entering a specified volume of airspace/hr
	4. Fuel burn per operations (tons)

Strategy
Medium term *(2010 - 2016)*

ATM Operational Concept Components (Doc 9854)	**TASKS**	**TIMEFRAME**		**RESPONSIBILITY**	**STATUS**
		START	**END**		
Airspace Organization and Management (AOM), Demand Capacity Balancing (DCB), Traffic Synchronization (TS) and Conflict Management (CM)	a) Develop the EUR PBN Harmonisation Strategy	2008-2009		EUR PBN TF EANPG	Completed Conclusion EANPG50/14 Conclusion COG44/8
	b) Develop the EUR PBN implementation plan	2008-2009		EUR PBN TF EANPG	Completed Conclusion EANPG50/14 Conclusion COG48/8
	c) Develop the EUR Region Airspace Concept based on PBN regional implementation plan, in order to design and implement a route network on the basis of PBN, e.g. RNAV 1, RNAV 5 and advance RNP(post 2015), and taking into account interregional harmonization	2010-2012		EUR PBN TF EANPG RDGE RNDSG	In progress
	d) Review, amend and approve the ICAO EUR SUPPS (Doc 7030) to reflect the equivalence of BRNAV vs RNAV5 and PRNAV vs RNAV1.	2008-2009		EUR PBN TF EANPG ICAO	Completed In progress

	e) Develop State PBN implementation plans that inter alia should also envisage establishment of the national PBN collaborative implementation teams to progress PBN, identify training needs and address safety issues.	2008-2011	States	In progress
	f) Develop the EUR PBN related performance measurement plan based on the following performance indicator - percentage of upper airspace routes based on PBN. Performance target - 90% PBN routes by 2016	2010-2011	EUR PBN TF EANPG RDGE RNDSG	In progress
	g) Establish a regional collaborative decision making process with regards to the PBN implementation	2008-2009	EUR PBN TF EANPG RDGE RNDSG EANPG	Completed
	h) Review or develop and publish regional/national regulations for aircraft and operators approval using PBN manual as guidance material.(RNAV 5 and RNAV 1 related)	2008-2012	EASA States	In progress
	i) Provide regional inputs into the global work within the ICAO PBN SG to develop an advanced RNP specification to meet future (post 2015) EUR requirements.	2010-2014	EUR PBN TF Eurocontrol	In progress
	j) Review, amend and approve the ICAO EUR SUPPS (Doc 7030) to to include the regional agreement on advanced RNP implementation.	2014-2016	EUR PBN TF EANPG ICAO	TBD
	k) Develop and publish regional/national regulations for aircraft and operators approval using PBN manual as guidance material.(advanced RNP related)	2014-2018	EASA States	TBD
	l) Monitor implementation progress and measure performance in accordance with the EUR PBN implementation plan and State implementation plan	2008-2016	EUR PBN TF States	In progress
	m) Implement PBN based routes	2008-2016	States	In progress
Supporting tools	1. Technology evaluation and gap analysis			
	2. Safety case and safety analysis			
	3. Business case and cost benefit analysis			
	4. Regional workshops and seminars			
ATM Community members	States, Aerodrome operators, Airspace providers, Airspace users, ATM service providers, ATM support industry, Regulatory authorities and ICAO			
ATM Community expectations	1. Right of access to ATM resources and equity for all users			
	2. Capacity to meets peak demands, while minimizing restrictions			
	3. Cost effective air navigation services			
	4. Minimize environmental impact			
	5. Flexibility in adapting flight trajectories			
	6. Technical and operational interoperability and harmonization			
	7. Consistent and dependable levels of service			
	8. Safety is highest priority			
Project Output	Subregional/national performance plan for implementation of air navigation system elements that are operationally suitable, technically feasible and economically viable.			

Project Outcome	Enhanced capacity and efficiency in the en-route airspace.
Risk Management	Risk factors: lack of funding; delay in aircraft equipage; Insufficient databases
	Risk mitigation: identification different funding sources; involvement of aircraft operators in the decision making; access to commercial databases
Linkage to GPIs	GPI/5: performance-based navigation; GPI/7: dynamic and flexible ATS route management; GPI/8: collaborative airspace design and management; GPI/9: situational awareness; GPI/12: FMS-based arrival procedures; GPI/17 Data link applications; GPI/18 Aeronautical information; GPI/19 Meteorological systems; GPI/20 WGS-84; GPI/21 Navigation systems; and GPI/22 Communication infrastructure.

Note – This performance framework plan addresses only the PBN implementation related elements that would allow achieving the objective of Enhancing capacity and efficiency of en-route airspace

STRATEGIC OPERATIONAL IMPROVEMENT/ REGIONAL PERFORMANCE OBJECTIVE ENHANCE CAPACITY AND EFFICIENCY OF TERMINAL AIRSPACE	
Performance Benefits	
Safety	1. Safety level maintained or improved
Environment	1. Reduced emissions through shorter flights and use of optimum routes/trajectories
Capacity	1. Increased capacity through better utilization airspace resources
Cost effectiveness	1. Fuel cost reduction through availability of more optimized routes/trajectories; and 2. Ability of aircraft to conduct flight more closely to preferred trajectories
Performance Measurement	
Metrics	1. Number of PBN based SIDs/STARs implemented
	2. Number of aircraft using PBN based SID/STAR
	3. Fuel burn per operations (tons)

Strategy
Medium term *(2010 - 2016)*

ICAO ATM Operational Concept Component (Doc 9854)	TASK DESCRIPTION	START-END	RESPON-SIBLE	STATUS
	a) Develop the EUR PBN Harmonisation Strategy	2008-2009	EUR PBN TF EANPG	Completed Conclusion EANPG50/14 Conclusion COG44/8
	b) Develop the EUR PBN implementation plan	2008-2009	EUR PBN TF EANPG	Completed Conclusion EANPG50/14 Conclusion COG44/8
	c) Develop the EUR Regional Airspace Concept based on PBN regional implementation plan, in order to design and implement optimised standard instrument departures (SIDs), standard instrument arrivals (STARs) on the basis of PBN and in particular RNAV 1 and advance RNP (post 2015), and taking into account interregional harmonization	2010-2012	EUR PBN TF EANPG RDGE RNDSG	In progress
	n) Review, amend and approve the ICAO EUR SUPPS (Doc 7030) to reflect the equivalence of BRNAV vs RNAV5 and PRNAV vs RNAV1.	2008-2009	EUR PBN TF EANPG ICAO	Completed In progress
	d) Develop State PBN implementation plans that inter alia should also envisage establishment of the national PBN collaborative implementation teams to progress PBN, identify training needs and address safety issues.	2008-2011	States	In progress
	e) Develop the EUR PBN related performance measurement plan based on the following performance indicator - percentage of SIDs/STARs based based on PBN. Performance target - 90% PBN based SIDs/STARs by 2016	2010-2012	EUR PBN TF EANPG RDGE RNDSG	In progress

Airspace Organization and Management (AOM), Demand Capacity Balancing (DCB), Traffic Synchronization (TS) and Conflict Management (CM)	f) Establish a regional collaborative decision making process with regards to the PBN based SIDs/STARs implementation	2008-2009	EUR PBN TF EANPG RDGE RNDSG EANPG	Completed
	g) Review or develop and publish regional/national regulations for aircraft and operators approval using PBN manual as guidance material.(RNAV 1 related)	2008-2012	EASA States	In progress
	h) Provide regional inputs into the global work within the ICAO PBN SG to develop an advanced RNP specification to meet future (post 2015) EUR requirements.	2010-2014	EUR PBN TF Eurocontrol	In progress
	i) Review, amend and approve the ICAO EUR SUPPS (Doc 7030) to to include the regional agreement on advanced RNP implementation.	2014-2016	EUR PBN TF EANPG ICAO	TBD
	j) Develop and publish regional/national regulations for aircraft and operators approval using PBN manual as guidance material.(advanced RNP related)	2014-2018	EASA States	TBD
	k) Monitor implementation progress and measure performance in accordance with the EUR PBN implementation plan and State implementation plan	2008-2016	EUR PBN TF States	In progress
	l) Implement PBN based SIDs/STARs	2008-2016	States	In progress
Supporting tools	5. Technology evaluation and gap analysis			
	6. Safety case and safety analysis			
	7. Business case and cost benefit analysis			
	8. Regional workshops and seminars			
ATM Community members	States, Aerodrome operators, Airspace providers, Airspace users, ATM service providers, ATM support industry, Regulatory authorities and ICAO			
ATM Community expectations	9. Right of access to ATM resources and equity for all users			
	10. Capacity to meets peak demands, while minimizing restrictions			
	11. Cost effective air navigation services			
	12. Minimize environmental impact			
	13. Flexibility in adapting flight trajectories			
	14. Technical and operational interoperability and harmonization			
	15. Consistent and dependable levels of service			
	16. Safety is highest priority			
Project Output	Subregional/national performance plan for implementation of air navigation system elements that are operationally suitable, technically feasible and economically viable.			
Project Outcome	Enhanced capacity and efficiency in the enroute airspace.			
Risk Management	Risk factors: lack of funding; delay in aircraft equipage; Insufficient databases			
	Risk mitigation: identification different funding sources; involvement of aircraft operators in the decision making; access to commercial databases			
Linkage to GPIs	GPI/5: performance-based navigation; GPI/7: dynamic and flexible ATS route management; GPI/8: collaborative airspace design and management; GPI/9: situational awareness; GPI/12: FMS-based arrival procedures; GPI/17 Data link applications; GPI/18 Aeronautical information; GPI/19 Meteorological systems; GPI/20 WGS-84; GPI/21 Navigation systems; and GPI/22 Communication infrastructure.			

Note – This performance framework plan addresses only the PBN implementation related elements that would allow achieving the objective of Enhancing capacity and efficiency of terminal airspace

STRATEGIC OPERATIONAL IMPROVEMENT/ REGIONAL PERFORMANCE OBJECTIVE **ENHANCE SAFETY, CAPACITY AND EFFICIENCY AT AERODROMES** **IMPLEMENT RNP APPROACHES**	
Performance Benefits	
Safety	1. Improvements in safety at aerodromes by replacing NPVs with LNAV/APV based on RNP APCH and/or RNP AR APCH
Environment	1. Reduction in CO2 emission and noise by implementing CDOs
Capacity	1. Increased capacity through better utilization airspace resources
Cost effectiveness	1. Fuel cost reduction through availability of more optimized routes/trajectories; and 2. Ability of aircraft to conduct flight more closely to preferred trajectories
Performance Measurement	
Metrics examples	1. Number of RNP APCH and/or RNP AR APCH based APVs and/or LNAV implemented
	2. Number of CDOs implemented
	3. Number of aircraft landing and taking off per hour
	4. Fuel burn per operations (tons)
	5. Number of CDOs

Strategy
Medium term *(2010 - 2016)*

ICAO ATM Operational Concept Component (Doc 9854)	TASK DESCRIPTION	START-END	RESPON-SIBLE	STATUS
	a) Develop the EUR PBN Harmonisation Strategy	2008-2009	EUR PBN TF EANPG	Completed Conclusion EANPG50/14 Conclusion COG44/8
	b) Develop the EUR PBN implementation plan	2008-2009	EUR PBN TF EANPG	Completed Conclusion EANPG50/14 Conclusion COG44/8
	c) Develop the EUR Regional Airspace Concept based on PBN regional implementation plan, in order to design and implement RNP APCH and/or RNP AR APCH based APV and /or LNAV operations and taking into account interregional harmonization and CDOs	2010-2012	EUR PBN TF Eurocontrol	In progress
	d) Develop State PBN implementation plans that inter alia should also envisage establishment of the national PBN collaborative implementation teams to progress PBN, identify training needs and address safety issues.	2008-2011	States	In progress
	e) Develop the EUR PBN related performance measurement plan based on the following performance indicators: - percentage of RNP APCH/RNP AR APCH based LNAV/APV vs NPV *Performance target –* *70% by 2014* *100% by 2016* *- percentage of CDOs implemented* *Performance target -* *50% CDOs by 2016*	2010-2012	EUR PBN TF Eurocontrol	In progress

Airspace Organization and Management (AOM), Demand Capacity Balancing (DCB), Traffic Synchronization (TS) and Conflict Management (CM)	f) Establish a regional collaborative decision making process with regards to the PBN approaches implementation	2008-2009	EUR PBN TF Eurocontrol EANPG	Completed
	g) Review or develop and publish regional/national regulations for aircraft and operators approval using PBN manual as guidance material.(RNP APCH and RNP AR APCH related)	2008-2012	EASA States	In progress
	h) Implement RNP APCH and/or RNP AR APCH based LNAV and or APVs and CDOs	2016	States	In progress

Supporting tools	Technology evaluation and gap analysis
	Safety case and safety analysis
	Business case and cost benefit analysis
	Regional workshops and seminars
ATM Community members	States, Aerodrome operators, Airspace providers, Airspace users, ATM service providers, ATM support industry, Regulatory authorities and ICAO
ATM Community expectations	1. Right of access to ATM resources and equity for all users
	2. Capacity to meets peak demands, while minimizing restrictions
	3. Cost effective air navigation services
	4. Minimize environmental impact
	5. Flexibility in adapting flight trajectories
	6. Technical and operational interoperability and harmonization
	7. Consistent and dependable levels of service
	8. Safety is highest priority
Project Output	Subregional/national performance plan for implementation of air navigation system elements that are operationally suitable, technically feasible and economically viable.
Project Outcome	Enhanced safety, capacity and efficiency during the approach and departure phases of flight.
Risk Management	Risk factors: lack of funding; lack of procedure designers, delay in aircraft equipage and operators approvals, absence of the global SBAS channel assignment allocation mechanism, some States do not approve GNSS for the approach phase, some regulators have no influence on business decisions of service provider to implement RNP approaches, Insufficient databases
	Risk mitigation: identification different funding sources; involvement of aircraft operators in the decision making; access to commercial databases, propose a solution for the establishing of the global SBAS channel assignment allocation mechanism.
Linkage to GPIs	GPI/5: performance-based navigation; GPI/8: collaborative airspace design and management; GPI/9: situational awareness; GPI/12: FMS-based arrival procedures; GPI/17 Data link applications; GPI/18 Aeronautical information; GPI/19 Meteorological systems; GPI/20 WGS-84; GPI/21 Navigation systems; and GPI/22 Communication infrastructure.

Note – This performance framework plan addresses only the PBN implementation related elements that would allow achieving the objective of Enhancing safety, capacity and efficiency at aerodromes.

European and North
ATLANTIC OFFICE

APPENDIX E

PROPOSAL FOR AMENDMENT OF THE REGIONAL SUPPLEMENTARY PROCEDURES, NAT REGION (Doc 7030/5)

(Serial No.: EUR/NAT-S 10/02 – EUR)

a) **Regional Supplementary Procedures:**

Doc 7030/5 – EUR.

b) **Proposed by:**

European Air Navigation Planning Group

c) **Proposed amendment:**

*Editorial Note**:*** Amendments are arranged to show deleted text using strikeout (~~text to be deleted~~), and added text with grey shading (text to be inserted).

1. *Amend* page (ix), Glossary as follows:

B-RNAV	Basic-RNAV (B-RNAV), also referred to as RNAV 5
PBN	performance-based navigation
P-RNAV	~~precision air navigation~~ precision-RNAV (P-RNAV)
RNAV 5	An RNAV specification having a lateral navigation accuracy of 5 nautical miles. RNAV 5 is also referred to as B-RNAV in the EUR
RNAV 1	An RNAV specification having a lateral navigation accuracy of 1 nautical mile. RNAV 1 approved aircraft are approved for P-RNAV

Deleted: basic area navigation

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2. *Insert* the following in Chapter 2 – Flight plans, paragraph 2.1.2 – Area Navigation (RNAV) Specifications

NOTE – This paragraph will be modified following the overall revision of the EUR SUPPS in connection with Amendment 1 to 15th Edition of the ICAO PANS-ATM (Doc 4444) with the applicability date of 15 November 2012.

3. *Insert* the following in Chapter 4 – Navigation, paragraph 4.1.1.2 – RNAV 5

Deleted: Nil.

Area of applicability

4.1.1.2.1 The requirements included in the RNAV 5 (B-RNAV) specification for en-route operations shall apply to all such operations conducted under IFR on designated RNAV 5 routes within the following FIRs as specified in the relevant State AIPs or NOTAMs:

Amman, Beirut, Cairo, Damascus and Tel Aviv.

Means of compliance

4.1.1.2.2 Conformance to the navigation requirement shall be verified by the State of Registry or the State of the Operator, as appropriate.

Note.— Guidance material concerning navigation requirements associated with RNAV 5 (B-RNAV) operations is contained in EASA AMC 20-4, Airworthiness Approval And Operational Criteria For The Use Of Navigation Systems In European Airspace Designated For Basic RNAV Operations.

Area of applicability

4.1.1.2.3 The requirements included in the RNAV 5 (B-RNAV) specification for en-route operations shall apply to all such operations conducted under IFR on the entire ATS route network in the following flight information regions (FIRs)/upper flight information regions (UIRs as specified in the relevant State AIPs):

Amsterdam, Ankara, Athinai, Baku, Barcelona, Bodø, Bordeaux, Bratislava, Bremen, Brest, Brindisi, Bruxelles, Bucuresti, Budapest, Canarias (AFI area of applicability), Casablanca, Chisinau, France, Hannover, Istanbul, Kharkov, København, Kyiv, Langen, Lisboa, Ljubljana, London, L'viv, Madrid, Malta, Marseille, Milano, München, Nicosia, Odessa, Oslo, Paris, Praha, Reims, Rhein, Riga, Roma, Rovaniemi, Scottish, Shannon, Simferopol, Skopje, Sofia, Stavanger, Sweden, Switzerland, Tallinn, Tampere, Tbilisi, Tirana, Trondheim, Tunis, Varna, Vilnius, Warszawa, Wien, Yerevan, Zagreb.

Means of compliance

4.1.1.2.4 Conformance to the navigation requirement shall be verified by the State of Registry or the State of the Operator, as appropriate.

Note.— Guidance material concerning navigation requirements associated with RNAV 5 (B-RNAV) operations is contained in EASA AMC 20-4, Airworthiness Approval And Operational Criteria For The Use Of Navigation Systems In European Airspace Designated For Basic RNAV Operations.

4. *Insert* the following in Chapter 4 – Navigation, paragraph 4.1.1.4. – RNAV 1

Deleted: Nil.

Area of applicability

4.1.1.4.1 The requirements included in the RNAV 1 and/or P-RNAV specification shall be applied whenever P-RNAV terminal control area (TMA) procedures, excluding the final and missed approach segments, are used.

Note 1.— RNAV 1 and/or P-RNAV approvals are not mandatory in the EUR Region.

Note 2.— RNAV 1 approved aircraft are approved for P-RNAV.

Means of compliance

4.1.1.4.2 Conformance to the navigation requirement shall be verified by the State of Registry or the State of the Operator, as appropriate.

Note.— Guidance material concerning navigation requirements associated with P-RNAV operations is contained in the JAA Temporary Guidance Leaflet (TGL) No. 10 Revision 1.

5. *Delete* the following in Chapter 4 – Navigation, Section 4.1.1.5.

~~*4.1.1.5.1 RNP 5*~~

~~*Area of applicability*~~

~~4.1.1.5.1.1 The following RNP 5 provisions shall apply to operations conducted under IFR on designated RNP 5 routes within the following FIRs:~~

~~Amman, Beirut, Cairo, Damascus and Tel Aviv.~~

~~*Means of compliance*~~

~~4.1.1.5.1.2 Within the FIRs specified in 4.1.1.5.1.1, only RNAV equipped aircraft having a navigation accuracy meeting RNP 5 may plan for operations under IFR on those ATS routes and within those level bands which have been specified as requiring RNP 5 in the relevant State AIP or NOTAM.~~

~~4.1.1.5.1.3 Aircraft operating under IFR on designated RNP 5 routes shall be equipped with, as a minimum, RNAV equipment meeting the following requirements:~~

~~a) a system use accuracy equal to, or better than, 4.6 km (2.5 NM) for one standard deviation, with a 95 per cent containment value of ±9.26 km (±5 NM), thereby meeting the accuracy requirements for RNP 5; and~~

~~b) an average continuity of service of 99.99 per cent of flight time.~~

~~4.1.1.5.1.4 Until such time as VOR or DME facilities cease to be available, the carriage of a single RNAV system having a navigation accuracy meeting RNP 5 but not meeting the above continuity of service requirements may be approved for RNAV operations if the aircraft is also carrying VOR and DME equipment.~~

~~4.1.1.5.1.5 Conformance to the navigation requirement shall be verified by the State of Registry or the State of the Operator, as appropriate.~~

~~*Note. Guidance material concerning navigation accuracy requirements is contained in the* Performance-based Navigation Manual *(Doc 9613).*~~*

~~4.1.1.5.1.6 The cross-track distances required to achieve a given level of containment for RNP 5 routes shall be as specified in the following table:~~

~~*Percentage containment for RNP 5*~~	
~~95~~	~~96~~
~~97~~	~~98~~
~~99~~	~~99.5~~

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km	9.3	10.2	10.2	11.1	12.0	13.9
NM	5.0	5.5	5.5	6.0	6.5	7.5

4.1.1.5.1.7 Correct operation of the aircraft RNAV system shall be verified before joining and during operation on an RNP 5 route. This shall include confirmation that:

a) the routing is in accordance with the clearance; and

b) the aircraft navigation accuracy meets RNP 5.

4.1.1.5.2 Precision RNAV (P-RNAV) and basic RNAV (B-RNAV)

4.1.1.5.2.1 The provisions in respect of en-route operations, as specified in 4.1.1.5.2.6 and 4.1.1.5.2.7, shall apply to all such operations conducted under IFR on the entire ATS route network as notified by the appropriate authorities in the following flight information regions (FIRs)/upper flight information regions (UIRs):

Amsterdam, Ankara, Athinai, Barcelona, Berlin, Bodø, Bordeaux, Bratislava, Bremen, Brest, Brindisi, Bruxelles, Bucuresti, Budapest, Canarias (AFI area of applicability), Casablanca, Chisinau, Düsseldorf, France, Frankfurt, Hannover, Istanbul, Kharkiv, København, Kyiv, Lisboa, Ljubljana, London, L'viv, Madrid, Malta, Marseille, Milano, München, Nicosia, Odessa, Oslo, Paris, Praha, Reims, Rhein, Riga, Roma, Rovaniemi, Scottish, Shannon, Simferopol, Skopje, Sofia, Stavanger, Sweden, Switzerland, Tallinn, Tampere, Tbilisi, Tirana, Trondheim, Tunis (FL 245 and above), Varna, Vilnius, Warszawa, Wien, Yerevan, Zagreb.

4.1.1.5.2.2 The provisions in respect of precision area navigation (P-RNAV) shall be applied whenever RNAV terminal control area (TMA) procedures, excluding the final and missed approach segments, are used.

Note. The carriage of P-RNAV equipment has not yet been mandated in the EUR Region.

Means of compliance – general

4.1.1.5.2.3 Conformance to the navigation requirement shall be verified by the State of Registry or the State of the Operator, as appropriate.

Note. Guidance material concerning navigation requirements associated with basic area navigation (B-RNAV) operations is contained in Joint Aviation Authority (JAA) Advisory Circular Joint (AC)J 20X4 (previously published as TGL No. 2, Rev 1) and for P-RNAV in JAA Temporary Guidance Leaflet (TGL) No. 10.

Means of compliance – terminal

4.1.1.5.2.4 Except as detailed in 6.6.3.2 and 4.1.1.5.2.5, only RNAV equipped aircraft having a lateral track-keeping accuracy of ±1 NM (2 SD), together with an ability to determine horizontal position to an accuracy sufficient to support the track keeping requirement and having appropriate functionality and operational approval, may operate under IFR on the RNAV terminal area procedures. Such RNAV equipment is designated hereafter as P-RNAV.

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~~*Note.— The functional and operational approval requirements appropriate to P-RNAV are set out in JAA TGL No. 10, or equivalent.*~~

~~4.1.1.5.2.5 Aircraft equipped with GNSS based RNAV equipment may be used only on RNAV area procedures designated for GNSS and where it is identified that P-RNAV approval is not required to operate on the procedure.~~

~~*Note.— To meet the requirement of GNSS based RNAV, aircraft need to be approved in accordance with JAA ACJ 20X5 (previously known as TGL No. 3, Rev. 1), or equivalent.*~~

~~*Means of compliance — en route*~~

~~4.1.1.5.2.6 Only aircraft approved for B-RNAV operations may plan for operations under IFR on the ATS routes of the FIRs/UIRs identified in 4.1.1.5.2.1. Aircraft not equipped with RNAV but having a navigation accuracy meeting RNP 5 will be restricted to operations on ATS routes which States may designate within their lower airspace in accordance with 4.1.1.5.2.7.~~

~~*Note.— To meet the requirements of B-RNAV, aircraft need to be approved in accordance with JAA ACJ 20X4 (previously known as TGL No. 2, Rev. 1), or equivalent.*~~

~~4.1.1.5.2.7 Until such time as VOR facilities cease to be available, the carriage of a single RNAV system not meeting an average continuity of service of 99.99 per cent of flight time may be approved for B-RNAV operations if the aircraft is also carrying VOR and distance-measuring equipment (DME) equipment.~~

~~*Note.— States may designate domestic routes within their lower airspace to be available for aircraft not fitted with RNAV equipment but having a navigation accuracy meeting RNP 5.*~~

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d) **Date when proposal received:**

15 January 2010

e) **Proposer's reason for amendment:**

This proposal for amendment was developed by the ICAO EUR PBN Task Force. The EUR PBN TF was established by the ICAO EANPG in order to progress the implementation of the ICAO Assembly Resolution 36-23 (superseded by the 37th Assembly Resolution) on PBN.

As part of its work programme, the EUR PBN TF was tasked to review the regional documentation that may need to be amended in view of the Assembly Resolution and ICAO PBN Concept as laid down in the ICAO PBN Manual (Doc 9613). In conducting this work, the EUR PBN TF had concluded that some of the ICAO EUR SUPPS (Doc7030) provisions were outdated and would need to be modified in order to harmonize them with the ICAO PBN Concept.

The current version of the EUR SUPPS contains requirements for B-RNAV and P-RNAV approvals and operations in the designated FIRs/UIRs as specified in the respective State AIPs. These types of approvals and operations were implemented in the ICAO EUR Region since 1998 and were predating the ICAO PBN Concept.

In reviewing the EUR SUPPS provisions and also respective B-RNAV and P-RNAV means of compliance type guidance material, and comparing them with the provisions of the ICAO PBN Manual, the EUR PBN TF in coordination with the ICAO Secretariat had concluded that requirements pertaining to the B-RNAV implementations in the EUR and RNAV 5 as described in Doc 9613 were identical. There were some differences identified between P-RNAV and RNAV 1 specifications, however it was concluded that P-RNAV could be considered as a subset of RNAV 1 and that RNAV 1 approved aircraft could be allowed to operate on P-RNAV routes with existing procedures that by this time have been already implemented in some areas within the EUR. Based on the foregoing analysis, it was concluded that this statement of equivalency of RNAV 5 vs B-RNAV and partially RNAV 1 vs P-RNAV should be clearly made in the EUR SUPPS. Similarly, EASA that was participating in the work of the EUR PBN TF has agreed that the same equivalency statement would be made in the respective EASA AMCs.

In conducting its work the EUR PBN TF was guided by the following strategic objectives as instructed by the EANPG:

a) requirements for navigation systems should be linked with operational requirements;
b) multiple avionics equipage and/or ground-based systems should be avoided; and
c) Avoid the need for multiple airworthiness and operational approvals.

The current proposal for amendment would allow the continuous operations of the presently B-RNAV and P-RNAV approved aircraft and developed procedures while enabling the harmonious transition towards the full scale ICAO PBN Concept as laid down in ICAO Doc 9613 and in line with the ICAO Assembly Resolution. The EUR PBN TF as part of its work programme has also developed the EUR PBN implementation plan (Conclusion EANPG51/14 refers) and PBN harmonisation strategy (Conclusion EANPG50/14 refers). In accordance with the EUR PBN implementation plan, the transition to and full implementation of RNAV 5 and RNAV 1 in the EUR en-route and terminal airspace would be completed by 2015.

f) **Proposed implementation date of the amendment:**

Upon approval by Council.

g) **Action by the Secretary General:**

The proposal has been circulated to the following States and international organizations.

Albania	Ireland	Slovenia
Algeria	Israel	Spain
Andorra	Italy	Sweden
Armenia	Kazakhstan	Switzerland
Austria	Kyrgyzstan	Tajikistan
Azerbaijan	Latvia	The former Yugoslav Republic of Macedonia
Belarus	Lithuania	
Belgium	Luxembourg	Tunisia
Bosnia and Herzegovina	Malta	Turkey
Bulgaria	Monaco	Turkmenistan
Croatia	Montenegro	Ukraine
Cyprus	Morocco	United Kingdom
Czech Republic	Netherlands	Uzbekistan
Denmark	Norway	
Estonia	Poland	Eurocontrol
Finland	Portugal	IACA
France	Republic of Moldova	IAOPA
Georgia	Romania	IATA
Germany	Russian Federation	IFALPA
Greece	San Marino	IFATCA
Hungary	Serbia	CANSO
Iceland	Slovakia	

h) **Secretariat's comments:**

The proposal for amendment was developed by the ICAO EUR PBN Task Force and endorsed by the 51st Meeting of the ICAO European Air Navigation Planning Group (EANPG/51) on 1-3 December 2009 (Conclusion 51/15 refers).

The proposal was then coordinated with the ICAO HQ to ensure its consistency with the global provisions and circulated to States and international organisations for comments on 8 July 2010 (ref EUR/NAT 10-0505.TEC (NAE/HOI)).

Some minor improvements were suggested during this consultation process that were included in the text and presented and agreed at the 4th Meeting of the EUR PBN TF on 30 November -1 December 2010).

Appendix F

Editorial Note: Amendments are arranged to show deleted text using strikeout (~~text to be deleted~~), and added text with grey shading (text to be inserted).

2. *Modify* the following in EUR SUPPs, Chapter 2 – Flight plans, paragraph 2.1.2 – Area Navigation (RNAV) Specification

2.1.2.1 Operators of aircraft conducting flights wholly or partly in the airspace specified in paragraph 4.1.1.2 and 4.1.1.4, and not RNAV 5 (B-RNAV) approved but which have been granted an exemption, shall insert the designator RNAVX in Item 18 of the flight plan preceded by EUR/.Where a failure or degradation results in the aircraft being unable to meet the B-RNAV requirements before departure, the operator of the aircraft shall insert the designator RNAVINOP in item 18 of the flight plan preceded by EUR/.2.1.2.2 Operators of aircraft approved for RNAV 5 (B-RNAV) operations, as set out in 4.1.1.2, shall insert the designator "R" in Item 10 of the flight plan and specify in Item 18 of the flight plan one or more of the designators "B1", "B2", "B3", "B4", "B5", preceded by PBN/.

2.1.2.3 Operators of aircraft approved for RNAV 1 and/or precision area navigation (P-RNAV) operations, as set out in 4.1.1.~~4~~, shall insert the designator "R" in Item 10 of the flight plan and specify in Item 18 of the flight plan one or more of the designators "D1", "D2", "D3", "D4", preceded by PBN/.

~~2.1.2.3~~

Deleted: Operators of approved aircraft for basic area navigation (B-RNAV) operations as set out in 4.1.1.5.2. shall insert the designator "R" in Item 10 of the flight plan.

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Deleted: 2.1.2.2 Operators of aircraft approved for precision area navigation (P-RNAV) operations as set out in 4.1.1.5.2, shall, in addition to the designator "R", also insert the designator "P" in Item 10 of the flight plan.¶
¶

Deleted: ~~Operators of State aircraft not equipped with RNAV shall not insert the designators "S" or "R" or "P" in Item 10 of the flight plan. Instead, STS/NONRNAV shall be inserted in Item 18 of the flight plan~~

Deleted: 2.1.2.4 Where a failure or degradation results in the aircraft being unable to meet the P-RNAV functionality and accuracy requirements of 4.1.1.5.2.4 before departure, the operator of the aircraft shall not insert the designator "P" in Item 10 of the flight plan. Subsequently, for a flight for which a flight plan has been submitted, an appropriate new flight plan shall be submitted and the old flight plan cancelled. For a flight operating based on a repetitive flight plan (RPL), the RPL shall be cancelled and an appropriate new flight plan shall be submitted.¶
2.1.2.5 In addition, where a failure or degradation results in the aircraft being unable to meet the B-RNAV functionality and accuracy requirements of 4.1.1.5.2.6 before departure, the operator of the aircraft shall not insert the designators "S" or "R" or "P" in Item 10 of the flight plan. Since such flights require special handling by ATC, Item 18 of the flight plan shall contain STS/RNAVINOP. Subsequently, for a flight for which a flight plan has been submitted, an appropriate new flight plan shall be submitted and the old flight plan cancelled. For a flight operating based on an RPL, the RPL shall be cancelled and an appropriate new flight plan shall be submitted.¶

Appendix G – FOLLOW UP ACTION LIST

ID #	TASK ID	WHO	WHEN	X-REF
4-1	Recommend to NSP to consider removal of APV II references from Annex 10	Secretary	PBN TF/5	Para 2.2
4-2	Compile information on the status of PBN and APV information from the responses to the renewed ICAO State letter and Eurocontrol LSSIP	Secretary Eurocontrol	PBN TF/5	Para 3.1
4-3	Distribute the PBN promotion leaflet to be produced by the United Kingdom to the PBN TF members	United Kingdom Secretary	PBN TF/5	Para 3.4
4-4	Provide information on equipage plans collected by IATA and Eurocontrol	IATA/Eurocontrol	PBN TF/5	3.7
4-5	Identify and establish contacts with potential States/service providers to initiate a regional Go-Team/REDII pilot-projects. Prepare projects scope definition	IATA/ICAO/Eurocontrol	PBN TF/5	3.13
4-6	Review the PBN related regional performance frameworks	PBN TF members	1 January 2011	3.15
4-7	Finalize the Appendix E- PBN related proposal for amendment to Doc 7030 , approval process	Secretary	PBN Tf/5	3.20
4-8	Forward Appendix F-“ Review of the Doc 7030 proposal for amendment developed by the EUR FPL TF” to the EUR FPL TF	Secretary	ASAP	3.21
4-9	Draft a letter to be addressed to EC/EASA raising concerns on the status of AMC20-27 and 20-28 to be signed by IATA, Eurocontrol and ICAO	IATA/Eurocntrol/ICAO	ASAP	3-29
4-10	Collect inputs from States, EASA, COG AIM TF and produce the first draft of the EUR APV implementation guidance material	Eurocontrol	PBN TF/5	4.2
4-11	a)Start the organisation process for an APV implementation workshop on 23-27 May 2011 in Paris preceded by one day best practise session and PBN TF/5 meeting. b) Coordinate the convening letter and the questionnaire with the PBN TF members c) Send a questionnaire in order to identify scope and champions for for the one day best practise session	Secretary Secretary Secretary	23-27 May 2011	5.1-5.6

ID #	TASK ID	WHO	WHEN	X-REF
	d)provide assistance and contributions in organisation and conduct of the workshop and best practise sessions	States, EASA, Eurocontrol, IFALPA, IATA		
4-12	Obtain the FAA SBAS channel assignment tool Draft a procedure for the globally coordinated SBAS channel assignment process	ICAO ICAO/PBN TF/5	ASAP PBN TF/5	6.7
4.13	Organise two PBN Airspace design workshops	Eurocontrol ICAO	July 2011 Nov 2011	2.6

-END-