



WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

Agenda Item 2: Aerodrome operations – improving airport performance

2.2: Performance-based navigation (PBN) – a practical way to improve airport performance with safety and efficiency

**SUMMARY OF THE PBN SYMPOSIUM AND WORKSHOPS
16 TO 19 OCTOBER 2012**

(Presented by the Secretariat)

EXECUTIVE SUMMARY

ICAO has demonstrated significant leadership and effort in promoting the implementation of performance-based navigation, through the provision of symposia, ICAO/IATA Go team visits, regional workshops, and educational forums, as well as the development of guidance material and training courses. This PBN forum was consistent with ICAO's strategy to expedite the global implementation of PBN to meet the timelines of Assembly Resolution 37-11 and help prepare States for the upcoming Twelfth Air Navigation Conference with respect to PBN.

This paper provides an overview of the Symposium and Workshops and includes a summary of the main issues with PBN implementation that were raised by the participants. The conference is invited to note the summary at the end of the paper.

1. INTRODUCTION

1.1 As part of its efforts to facilitate the global implementation of performance-based navigation (PBN), and to assist States in meeting the timelines of Assembly Resolution 37-11, ICAO organized the PBN Symposium and Workshops at ICAO Headquarters Montreal, from 16 to 19 October 2012. The timing of the symposium was purposely set to precede the Twelfth Air Navigation Conference (AN-Conf/12) in order to provide a status update and increase awareness of the global issues impacting the timely implementation of PBN, the number one priority for air navigation.

1.2 The aim of the symposium and workshops was to bring the global experts together in one location, to emphasize the value of PBN to increasing flight safety and operational efficiency, and to seek solutions to implementation barriers. The main objectives were to provide updates on developments, strategies and guidance material, report on the status of global and regional implementation, describe actual examples of PBN in use today, and identify the challenges to implementation. With these objectives in mind, the theme of the symposium, was "Expediting Implementation Together" which inferred that in order to accelerate PBN implementation, it must be a team effort, requiring participation and collaboration by all Stakeholders.

2. OVERVIEW

2.1 This three and a half day symposium provided a comprehensive program for all participants including representation from government regulators, air navigation service providers, international associations, airline operators and general aviation, ATM system manufacturers, avionics designers, air traffic controllers, pilots, the military, aeronautical information companies and instrument procedure design organizations. Over 400 participants from sixty-seven Member States and thirteen international organizations attended.

2.2 The format included both plenary sessions and two focused workshops. The plenary sessions provided a high level overview and confirmation of why PBN implementation is necessary now and set the 'call for action' tone for all Stakeholders to be proactive. Status of global implementation as well as actual examples of the significant benefits resulting from specific State PBN programs were also explained. The workshops dealt with the various ATM and flight operations issues that impact implementation. More than fifty speakers provided expert presentations on a myriad of topics. All presentations as well as the full agenda can be accessed by going to the PBN Symposium web-site at: <http://www.icao.int/Meetings/PBN-Symposium/Pages/default.aspx>.

2.3 To assist States with the implementation of PBN, ICAO with support from States, organizations and international associations, developed new guidance material and documentation. These new documents were included in a PBN *iKit*, which was provided free to all participants. This *iKit* was designed specifically for aviation professionals (executives, regulators, ANSPs, operators and manufacturers) and is tailored to their particular responsibility and domain. The *iKit* will also be provided to all participants of the 12th ANC and is currently available on-line at the PBN web-site: <http://www.icao.int/safety/pbn/SitePages/PBN%20ikit.aspx>.

2.4 ICAO also took initiative to promote the design of PBN instrument flight procedures. ICAO developed an endorsement mechanism of Instrument Procedure Design Organization to assist States with the implementation of PBN. The endorsement is awarded for the design of both conventional and PBN instrument flight procedures and is based on the organization meeting all ICAO conditions and criteria. Five organizations received an ICAO endorsement during the symposium. More information can be found on the PBN web-site at: <http://www.icao.int/safety/pbn/Pages/PBN-Endorsement.aspx>

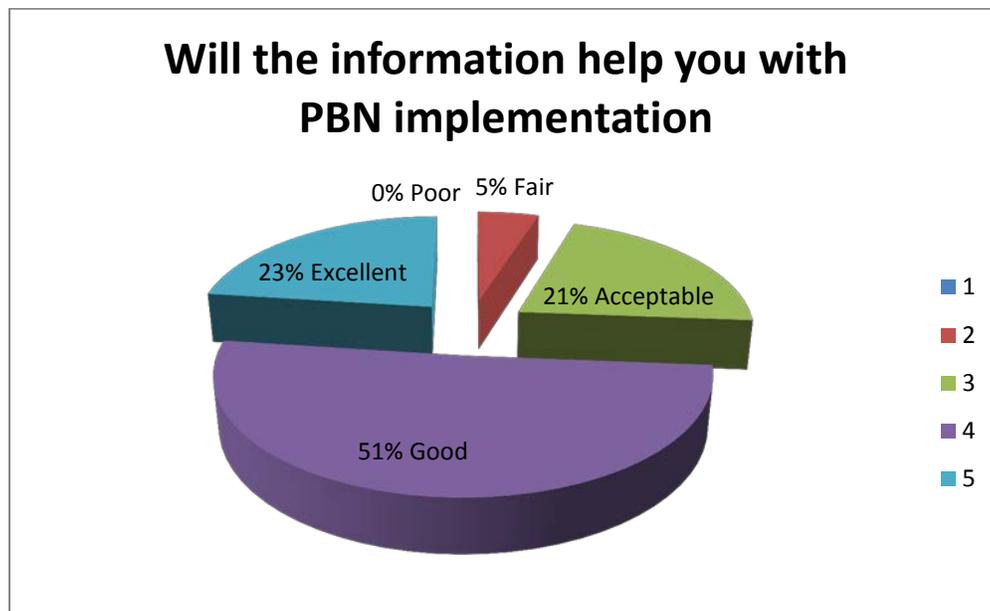
2.5 In addition, the symposium provided the opportunity for organizations to display and demonstrate specific products, tools and capabilities that can assist States with the implementation of PBN. Six exhibitors including instrument procedure designers, avionics and aerospace technologies manufacturers, ATM system manufacturers, and air navigation service providers (ANSPs) participated.

3. ASSESSMENT

3.1 Throughout the plenary sessions and the workshops, the underlying message heard was that there are still major challenges with the understanding and implementation of PBN. Participants were very appreciative of the fact that ICAO took the initiative to organize the event as it provided 'one-stop shopping' for information, expertise, interaction and dialogue on this important air navigation matter. More importantly, it identified the issues that still exist with implementation, through the discussions in both the plenary sessions and the workshops. Attachment A provides summary of the issues which can also be found in the presentations of the closing session at: <http://www.icao.int/Meetings/PBN-Symposium/Pages/Presentations.aspx?RootFolder=%2FMeetings%2FPBN%2DSymposium%2FPresentations%2FClosing%20Session&FolderCTID=0x012000CB4445B2309B674DAC9706D84C6DFA3C&View={A282A209-1183-489A-A466-E94B1D7B00CB}>.

3.2 The symposium also highlighted the fact that the PBN concept continues to evolve. New navigation specifications and documentation have just been developed and published. Others are under consideration and will require further investigation. Current instrument procedure design criteria is considered too conservative. Consequently these issues indicate that further work to support PBN implementation will be required to address overall understanding and education, documentation, criteria, and training.

3.3 To gauge the value of the symposium and workshops, a feedback form was distributed to all participants at the closing of the forum. In general, the participants felt that event was certainly worthwhile and that future symposiums should be planned to provide updates and ‘howgozits’ with the Assembly Resolution 37-11 timelines. The following two charts provide the main points from the feedback:



4. **SUMMARY**

4.1 The outcome of the PBN symposium and workshops was positive in many areas. It was well attended by all Stakeholders involved with PBN implementation. It reinforced the importance and priority of PBN implementation in respect to safety and efficiency and emphasized its status as the number one priority for air navigation. It brought together the experts from around the world to one location making information, interaction and dialogue on many issues, successful. It provided an update on global implementation of PBN in regard to the Assembly Resolution 37-11, showing clearly where deficiencies continue to exist. It provided new documentation, guidance and training material, to assist States with implementation. Finally, it highlighted outstanding challenges affecting PBN implementation and areas for further work.

4.2 Lastly, the Symposium provided a clear indication that the PBN concept is not fully mature. It continues to be an evolving program, as new specifications are needed and developed. This evolution will drive new requirements that will demand additional provisions. ICAO with its partners must be prepared to continue to support PBN implementation in the foreseeable future. Without ICAO and its partners acting as a champion, there is a high risk that the rate of PBN implementation will slow significantly.

APPENDIX

SUMMARY OF MAIN TECHNICAL POINTS FROM THE PBN SYMPOSIUM AND WORKSHOPS

16 to 19 October 2012

Symposium Summary (including Workshops)

- Complete State PBN implementation plans
- Encourage establishment of multi-disciplinary collaborative decision making teams to expedite PBN implementation
- Block 0 is ready; ICAO has developed standards, procedures guidance, computer-based learning packages, and have provided workshops and formal courses. Implement Block 0 now!
- Take baby implementation steps, involve all Stakeholders early, educate and communicate
- Visit and learn from each other's successes with PBN implementation
- Share regulatory and guidance material (through an ICAO website)
- Provide downloadable template for JOBAIDS and Ops approval submissions
- Increase education and awareness of PBN – Stakeholders to organize workshops, courses and informational sessions to address internal awareness
- Encourage States to commence using Ops approval manual
- Encourage States to recognize foreign carrier approvals – Need for a global single Ops approval process and reciprocity among States
- Incorporate PBN into standard instrument rating training
- Incorporate PBN into the standard aircraft equipment fit
- Develop standard phraseology for CCO and CDO
- Mixed mode operations can be done successfully – don't wait, start now. To implement mixed mode, learn from other implementations and identify champions early. Plan for mixed equipage and capability
- Provide a PBN Help Desk/on-line forum to assist States with PBN Implementation
- Collaboration is key to implementation – include all disciplines in the process. PBN is a team game
- With GNSS available, gather lateral performance data to justify reduction in route spacing
- Develop new design criteria for:
 - Guided visual approaches
 - RNP AR departures
- Develop back-up plans for loss of GNSS capability
- Determine separation criteria for free/direct routes
- Address PBN terminal procedures with long paths
- Review PANS-Ops instrument procedure design criteria – too conservative

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