

Negmatov D.A.

*Student of master school of the Department of Air Navigation Systems
Tashkent State Technical University named after Islam Karimov
Uzbekistan, Tashkent*

Ibrokhimov B.F.

*Student of master school of the Department of Air Navigation Systems
Tashkent State Technical University named after Islam Karimov
Uzbekistan, Tashkent*

Ashurbekov R. Kh.,

*PhD. associate professor of the Department of Air Navigation Systems
Tashkent State Technical University named after Islam Karimov
Uzbekistan, Tashkent*

Shukurova S.M.

*senior Lecturer of the Department of Air Navigation Systems
Tashkent State Technical University named after Islam Karimov
Uzbekistan, Tashkent*

THE EFFECTIVENESS OF THE PBN CONCEPT IN THE GLOBAL AVIATION INDUSTRY

Abstract: *In the old days, the flight route had to pass strictly through radio navigation points, in other words, radio navigation guidance had to be provided on each section of the route. It is obvious that when using this method of navigation, the length of the route increases, and therefore the total cost of transportation as well. the ability to perform a flight without being tied to the Nav.points gives a number of advantages. First of all, this is a significant reduction in flight time, i.e. direct savings on fuel and other costs associated with the operation of the aircraft. When performing a flight using PBN equipment, a wide network of ground-based radio navigation facilities is not required.*

Key words: PBN, Area navigation, CCO/CDO, RNAV, ICAO, IATA.

Негматов Д.А.

магистрант кафедры «Системы аэронавигации»

Ташкентский государственный технический университет имени

Ислама Каримова

Узбекистан, г. Ташкент

Иброхимов Б.Ф.

магистрант кафедры «Системы аэронавигации»

Ташкентский государственный технический университет имени

Ислама Каримова

Узбекистан, г. Ташкент

Ашурбеков Р. Х.,

к.т.н. доцент кафедры «Системы аэронавигации»

Ташкентский государственный технический университет имени

Ислама Каримова

Узбекистан, г. Ташкент

Шукурова С. М.

старший преподаватель кафедры «Системы аэронавигации»

Ташкентский государственный технический университет имени

Ислама Каримова

Узбекистан, г. Ташкент

Эффективность применения концепции PBN в мировом авиационном сообществе

Аннотация: *В прежние времена маршрут полета должен был проходить строго через радионавигационные пункты, то есть радионавигационное наведение, должно было обеспечиваться на каждом участке маршрута. Очевидно, что при использовании такого способа навигации*

увеличивается протяженность маршрута, а следовательно, и общая стоимость перевозки. возможность выполнять полет без привязки к навигационным точкам дает ряд преимуществ. При выполнении полета с использованием аппаратуры PBN широкая сеть наземных радионавигационных средств не требуется. В данной работе пойдет речь о PBN.

Ключевые слова: PBN, зональная навигация, CCO/CDO, RNAV, ИКАО, ИАТА.

The PBN¹ concept specifies that the performance requirements of an on-board RNAV² system should be defined in terms of accuracy, integrity, operational availability, continuity and functionality required to perform the intended flights in the context of the specific airspace concept. The PBN concept represents a transition from sensor-based navigation to performance-based navigation. The performance requirements are specified in the navigation specifications, which also define which navigation sensors and equipment can be used to meet these performance requirements. These navigation specifications are set out in sufficient detail to ensure coherence at the global level by providing States and operators with specific guidance on implementation. When using PBN, general navigation requirements are determined based on operational requirements.

Operators then consider various options based on the available technical means and navigation services that would ensure compliance with these requirements. Thus, the operator has the opportunity to choose a more cost-effective option, rather than a solution that is prescribed as part of the operational requirements. the technique is improved over time, but there is no need to revise the operational process as such, as long as the nav system

¹ Performance-based navigation

² Area navigation

provides the expected level of performance. It is assumed that in the framework in the future work of ICAO³, other means of complying with the requirements of the navigation specifications will be explored, which may, if necessary, be included in the relevant navigation specifications.

The flexibility of the pbn concept becomes apparent when developing routes of arrival to and departure from airports. PBN provides more flexible use of airspace, allows for more extensive use of CCO⁴/CDO⁵, optimizes route separation and implementation of conflict resolution measures, and contributes to environmental benefits resulting from reduced fuel consumption and emissions.

Standard instrument arrival routes (STARs) can be designed in such a way as to exclude conflict situations with departures, to provide the possibility of cdo and be combined with instrument approach patterns, resulting in a continuous descent to the intermediate approach stage. standard instrument departure routes (SIDs) can be designed so that they do not overlap with arrival routes and include profiles of constant climb until the absolute altitude of the flight along the route is reached. a practical indicator for assessing the progress of PBN implementation regarding the arrival and departure stages is the annual increase in the number of published sids and stars using PBN.

Over the past 5 years, there has been a significant increase (130-180 %) in the number of published approach and departure procedures using PBN. To this date, many SIDs and STARs using PBN have been published to make happen major of the busiest airports to have their own separate routes. PBN accounts for about 40 % of the total number of published arrival and departure route by instrument.

The special Group of PBN concept implementation (TF) PBN was jointly

³ International Civil Aviation Organization

⁴ Continuous Climb Operation

⁵ Continuous Descent Operation

established by ICAO and IATA⁶ to strengthen the global and regional structures established for PBN implementation and to develop tools and tools to facilitate and accelerate work. Recognizing the need for additional support from States, the Global TF PBN agreed to the proposal for the formation of groups as the main sources of professional knowledge and experience of service providers, regulators and industry experts At the first stage (2010-2012), groups visited 9 locations, covering all ICAO regions and involving more than 300 PBN experts worldwide.

In response to this early success, ICAO and IATA agreed to launch the second phase of the activities. The objective of this phase was twofold: to increase the competence of States and stakeholders in the two main areas of PBN- operational approval and the development and development of the airspace concept. At this stage of the group visited Miami, South Africa, Thailand, United Arab Emirates and China.

Literature and sources

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⁶ International Air Transport Association