



INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY SIXTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION  
PLANNING AND IMPLEMENTATION REGIONAL GROUP  
(APANPIRG/26)

Bangkok, Thailand, 7 – 10 September 2015

**Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation**

**3.0: Regional and National Performance Framework**

**PERFORMANCE-BASED APPROACH TO ASBUs IMPLEMENTATION**

(Presented by the Secretariat)

**SUMMARY**

This paper highlights the advantages of acquiring a Performance-Based Approach (PBA) when planning the implementation of new operational improvements in the air navigation system. It also presents ICAO initiatives at global, regional and national levels, focused on the Aviation System Block Upgrades (ASBUs), to support this approach.

*Strategic Objectives:*

- A: **Safety** – Enhance global civil aviation safety
- B: **Air Navigation Capacity and Efficiency**—Increase the capacity and improve the efficiency of the global aviation system
- E: **Environmental Protection** — minimize the adverse environment effects of civil aviation activities.

**1. INTRODUCTION**

1.1 The air navigation system is increasingly being discussed in terms of performance and, in particular, the need to adopt a Performance-Based Approach (PBA) when planning, implementing, operating and monitoring. The notion of a PBA emanated from good industry practices that have emerged over the years and is strongly focused on results, collaborative decision-making and reliance on facts and data for decision making.

1.2 The advantages of a PBA are numerous and include transparency, promotion of accountability, and a shift from prescribing solutions to specifying expected performance. A PBA is also results-oriented, employs quantitative and qualitative methods, helps decision makers to set priorities, facilitates the determination of appropriate trade-offs and supports optimum resource allocation.

1.3 The first step in implementing a successful PBA is to define indicators in the performance areas subject to analysis and monitoring. ICAO defined in the *Global Air Traffic Management Operational Concept* (Doc 9854) eleven Key Performance Areas (KPAs) for the global Air Traffic Management (ATM) system, to be noted: access and equity, capacity, cost-effectiveness,

efficiency, environment, flexibility, global interoperability, participation by the ATM community, predictability, safety and security. When future scenarios are going to be analyzed, unavoidable assumptions need also to be made. These indicators and assumptions should be common, up to date and accessible to every stakeholder involved in the performance cycle, in order to avoid future inconsistencies.

1.4 The second step is to set up targets. These targets are the top level of the performance based top-down approach. They should be aligned with strategic objectives and agreed at a global or regional level through a collaborative decision approach regarding operational data but also for socio-economic reasons.

1.5 As important as the definition of targets is the calculation of performance needs. Air traffic volume is growing day by day; therefore, in order to improve or even keep the same quality of service, some performance needs arise at local level. Data collection, processing, storage and reporting should be completed to identify these needs. These needs constitute the gap between the current performance of the air navigation system and the defined targets. Consideration should be given to these needs when planning and prioritizing future investments. ICAO encourages States to calculate their needs within the eleven KPAs, using the common Key Performance Indicators (KPIs) and taking into account traffic forecasts.

1.6 Once the performance needs have been identified, it is then necessary to find the optimum solution for these needs while ensuring interoperability. This third step constitutes the real decision-making stage of the process. This decision should consider costs, benefits, incentives, funding and financing as well as available resources. At the end of this step, what remains to be considered is to ensure the deployment of the optimum solution overcoming potential challenges.

1.7 Once the top-down approach has been completed and the optimum solution totally or partially implemented, the last step to close successfully the PBA cycle, is to measure the performance results of the system. These results constitute the main deliverable from the performance based bottom-up approach and are specific of each operating scenario. During this process, assumptions should not be made; however, attention should be paid to double counting benefits when measuring results, as often the optimum solution is not an isolated operational improvement but a group of them. The implementation level associated to the gathered results should be captured. Ultimately, this step will allow to verify if the targets have been achieved and the needs fulfilled.

1.8 The Planning and Implementation Regional Groups (PIRGs) play a major role in the implementation of a successful PBA. They are the main link between the PBA top and bottom, as well as the main support for the States to improve their air navigation system. ICAO encourages States to report collected data to the PIRGs and to seek advice for the planning and implementation of new operational improvements that will meet their needs.

## **2. DISCUSSION**

2.1 Initially, the planning of the air navigation system was driven by technology advances instead of performance needs. It was not until 2007 when the importance of acquiring a PBA for the planning of the air navigation system was captured by ICAO, within the 3<sup>rd</sup> edition of the *Global Air Navigation Plan (GANP)* (Doc 9750).

2.2 In particular, ICAO reflected this approach on the Aviation System Block Upgrade (ASBU) strategy. The upgrades define a programmatic and flexible global system engineering strategy allowing States to advance their air navigation capacities based on their specific operational needs.

2.3 The GANP represents a rolling, 15 year strategic methodology which leverages existing technologies and anticipates future developments based on State/industry-agreed operational objectives. The GANP is an overarching framework that includes key aviation policy principles to assist ICAO Regions and States with the preparation of their regional and national air navigation plans and to support the establishment of air navigation priorities. Thus, the GANP has a clear and functional relationship to the regional Air Navigation Plans (ANPs), as a guide towards the common future of international civil aviation and as a framework to ensure interoperability.

2.4 ANPs set forth in detail the facilities and services required for international air navigation within a specified area. Such plans contain recommendations that States can follow in planning the provision of their air navigation facilities and services in order to ensure the development of an integrated regional system. The ANPs represent the bridge between, on one side, the GANP and the ICAO Standards and Recommended Practices (SARPs), and on the other side, the States' air navigation plans and implementation status.

2.5 Therefore, in 2014, in order to be coherent and to ensure continuity in the top down approach, ICAO defined the new electronic regional Air Navigation Plan (eANP) template and decided that the ANPs should be published in three volumes. The new eANP Volume I contains stable plan elements (such as the geographical area of the flight information regions or the basic operational requirements and planning criteria), while Volume II contains the more dynamic ones (air navigation facilities and services). Volume III contains dynamic/flexible plan elements providing implementation planning guidance for air navigation systems and their modernization, taking into consideration the ASBUs and associated technology roadmaps described in the GANP. This last volume would also include appropriate additional guidance, particularly with regard to implementation, to complement the material contained in Volumes I and II.

2.6 In order to facilitate the management of these new eANPs, as well as to expedite its process for amendment, ICAO is developing a web-based platform. This platform will facilitate public access to the eANPs of all regions and provide a global view of the air navigation system planning. The new approaches in Volumes II and III allow significant flexibility to States to plan while increasing the possibility to enhance coordination, particularly for States in the interface area with adjacent regions.

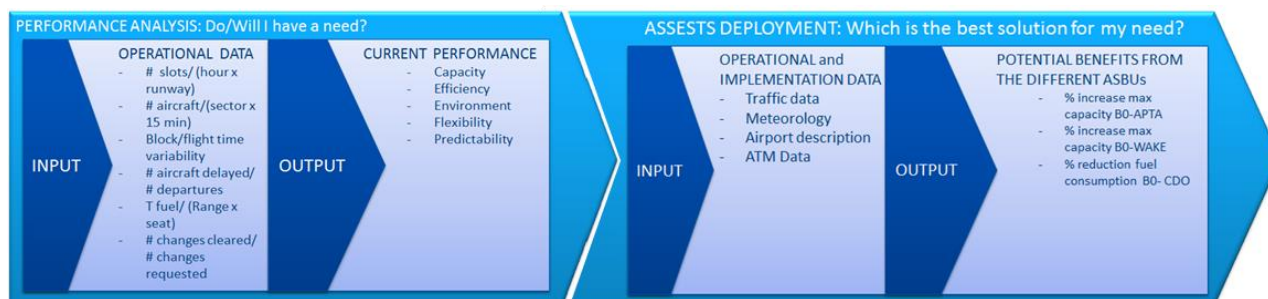
2.7 States are responsible for the planning and implementation of their own air navigation systems so that services can be delivered to achieve the expected performance. In order to support States, ICAO is developing the ASBUs-Performance Assessment Interactive Tool (A-PAINT). This tool will be based on influence diagrams and influence models and validated with scenarios where the ASBUs have already been implemented. There will be two distinguishable applications available in the tool.

2.8 The first one will consist of a performance analysis of the current situation. This application will assist States to identify their needs in the different KPAs by inputting operational air navigation data of their particular scenarios.



Figure 1 Performance Analysis

2.9 Once the needs have been identified with the first application, the second application will calculate the potential benefits expected from the ASBU elements in the identified KPAs. States will be able to have a list with the specific contribution of the ASBU elements to the KPA where they are facing a need or will be facing a need, by inputting operational and implementation data to define their specific operational scenarios.



**Figure 2 Assets deployment**

2.10 Thus, it is fundamental to define common KPIs and supporting metrics in the KPAs, so that the States' efforts to collect data are well spent.

2.11 This tool, together with a Cost Benefit Analysis (CBA) will help States to define their optimum solution. ICAO is working to deliver guidance material to perform CBAs for the ASBUs implementation as well as to take into account the consideration of incentives and funding and financing.

2.12 Finally, ICAO will develop deployment packages to support implementation once the States have identified their optimum solution. These deployment packages will consist of SARPs and guidance material, but also training, workshops, seminar, symposia, etc. to ensure effective implementation of the identified solution and achieve the expected performance.

### **3. ACTION BY THE MEETING**

3.1 The Meeting is invited to:

- a) Note the information contained in this paper;
- b) Note the importance of implementing a performance-based approach to ensure optimum resource allocation;
- c) Note the relevance of defining common indicators and performance metrics; and
- d) Note the key role of the Regions to succeed in this approach.