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# GLOBAL PERFORMANCE OF THE AIR NAVIGATION SYSTEM(Doc 9883)

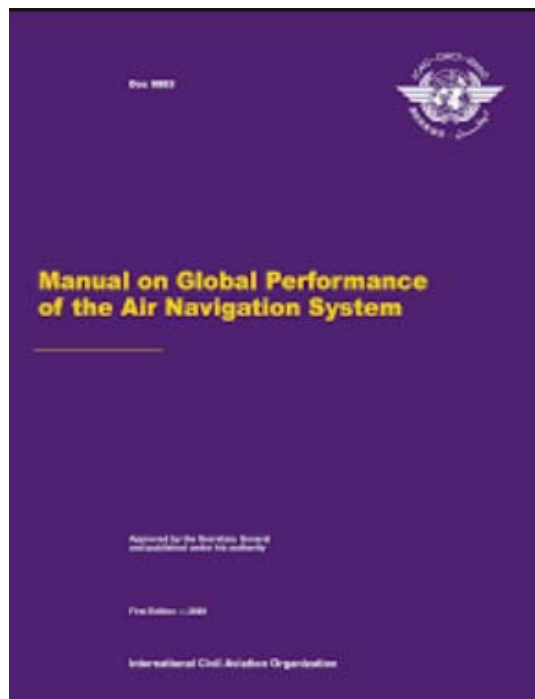
WORKSHOP ON THE APPLICATION AND DEVELOPMENT OF THE  
VOL. III OF THE CAR / SAM E-ANP INCLUDING KPI FORMULATION  
FOR THE SAM REGION

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Doc. 9883 -Manual sobre la actuación mundial del sistema de navegación aérea – Primera edición 2009

Doc. 9883 – Manual on Global performance of the Air Navigation System – First Edition



**Doc. 9883**

**PART I  
Global Performance**

**PART II  
DIRECTRICES PARA LA TRANSICIÓN  
BASADAS EN EL RENDIMIENTO**





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**Doc. 9883**

**PARTE I**  
**GLOBAL PERFORMANCE**



## Concepto de la Performance Based Approach Concept (PBA)

- Well-founded Industrial Practices Outside of Aviation
- Evolution of the Industry towards a less regulated and more business environment, the advantages of implementing an air navigation system based on performance are becoming more and more evident.





## PBA Principles

The **performance**-based approach (PBA) applied in this context is based on the following principles:

- concentration on desired or required results;
- informed decision making, motivated by the desired or required results; and
- decision making based on facts and data.





## Considerations

- It requires sharing knowledge and instruction;
- Expected result: More efficient system
- Demands: Globally coordinated effort
- Scope of application: economic management, transition management, safety management, aviation security management, communications, etc.



## Harmonized Terminology

The Manual encourages the **use of harmonized terminology** among members of the ATM community who apply the performance-based approach in their areas of interest.

This **terminology** is introduced progressively, through the various chapters and sections of the document.





## Harmonized Terminology

**Key Performance Area (KPA):** KPAs are the way to categorize performance aspects relative to high-level ambitions and expectations.

ICAO has defined 11 KPAs: safety, aviation security, environment, cost-effectiveness, capacity, flight efficiency, flexibility, predictability, access and equity, participation and collaboration, and interoperability

(see Chapter 2, 2.2.4, Appendix A, Figure I-A-2 and 3.3).



## Harmonized Terminology

**ATM community:** The ATM community is defined in Appendix A of the Global Air Traffic Management Operational Concept (Doc 9854). Includes (in alphabetical order) regulatory authorities, the aerodrome community, States, the ATM support industry, the International Civil Aviation Organization (ICAO), airspace providers, ATM service providers, and space users aerial

(see Chapter 1, 1.3.2).



## Harmonized Terminology

**Performance-based approach (PBA):** The performance-based approach is a decision-making method based on three principles: strong focus on desired or required results; informed decision making motivated by said desired or required results and decision making based on facts and data.

The PBA is a way to organize the performance management process

(see Chapter 1, 1.2.1 and Chapter 2, 2.1).



## Harmonized Terminology

**Performance indicator - KPI.** Current or past performance, anticipated future performance (estimated as part of performance forecasting and modeling), as well as actual progress in achieving performance targets, are expressed quantitatively by indicators (sometimes referred to as key performance indicators, or KPIs). )



## Harmonized Terminology

**Performance Framework:** The performance framework is the set of definitions and terminology that describe the basic elements used by a group of members of the ATM community to collaborate on performance management activities.

This set of definitions comprises the hierarchical levels of global ATM performance, the eleven key performance areas, a set of process capability areas, areas of focus, performance targets, indicators and targets, supporting metrics, target lists of dimension, its aggregation hierarchies and classification plans  
(see Appendix A).



## Harmonized Terminology

**Performance Target:** Performance target are closely related to Performance Indicators - they represent the Performance Indicator values that must be met or exceeded in order to consider that a performance objective has been fully achieved

(see Chapter 2, 2.4.3, Appendix A, Figure I-A-2 and 3.6).





## Harmonized Terminology

**Support metric.** Supporting metrics are used to calculate the performance indicator values.

For example, cost per flight indicator =  $\text{sum (costs)} / \text{sum (flights)}$ .  
Performance measurement is done by collecting data for supporting metrics (eg, this leads to the need to collect cost data and flight data)

(see Chapter 2, 2.4.2, Appendix A, Figure I-A-2, 3.8, Appendix B, 3, Appendix C, 4.3.3 and Appendix D).



## Harmonized Terminology

**Performance Objectives.** Within concentration areas, the possible intention to establish performance management is “activated” by defining one or more performance objectives.

These define - in a qualitative and concentrated way - a desired trend from the current performance (eg improvement). A distinction is made between generic goals and “instantiated” goals.



## Harmonized Terminology

**Generic objectives** focus specifically on what needs to be accomplished, but do not state when, where, who, or how much.

The **instantiated objectives** add the when, where, who, and how much to the generic goals. Instanced objectives can have indicator values and related goals

(see Chapter 2, 2.3.3, Appendix A, Figure I-A-2, 3.5 and 3.6).



The Doc 9883 main part summarizes the three most frequently asked questions about the performance-based approach - PBA:

— **What is its purpose?** The basic principles, benefits, purpose, application and factors for success are explained in Chapter 1 (Introduction). This chapter should help you decide where and when to implement (or modify) the performance-based approach in your organization..

Keep going...





— **What is it really about?** The performance-based approach is a method of making decisions.

A step-by-step description with an example is provided in Chapter 2 (The performance-based approach).

The purpose of this chapter is to show that the approach can be broken down into manageable and easy-to-understand stages. By following these steps, members of the ATM community should gain confidence in their ability to apply the approach successfully, and benefit from their participation in a globally harmonized approach..



- If our objective is to apply it, **how do I start?** Some guidelines on getting organized (and your PBA “project”) are provided in **Chapter 3** (Getting Started).

The **Appendices** provide more specific or technical guidance on selected topics. **Chapter 4** provides an overview (summary) of the content of these appendices.



## Chapter 5.- REFERENCES

1. Global Air Traffic Management Operational Concept (Doc 9854)
2. Manual on Air Traffic Management System Requirements (Doc 9882)
3. Manual on the Economics of Air Navigation Services (Doc 9161)
4. Global Air Navigation Plan (Doc 9750)
5. Safety Management Manual (Doc 9859)



## Doc. 9883

### Part II – Performance-based Transition Guidelines

The scope of this part is intentionally limited to providing a broad overview of the tasks that must be undertaken in order to adopt a **performance-based approach to transition**.



The main objectives of this part are threefold:

- 1 — To raise awareness for the need to change how the evolution of air traffic management (ATM) is planned at local, regional and global levels.
- 2 — To provide “getting started” guidance on how to adopt a performance-based approach in the transition from today’s ATM system, towards the future ATM system
- 3 — To promote a globally harmonized and agreed upon approach to transition planning in order for regions and States to work collaboratively in developing their future transition arrangements towards the ATM system envisioned in the global ATM operational concept..



## THE PERFORMANCE-BASED APPROACH STEP-BY-STEP

The objective of this six-step cyclical approach is to identify optimal solutions based on operational requirements and performance needs so that the expectations of the aviation community can be met by improving air navigation system performance and optimizing allocation and use of available resources.



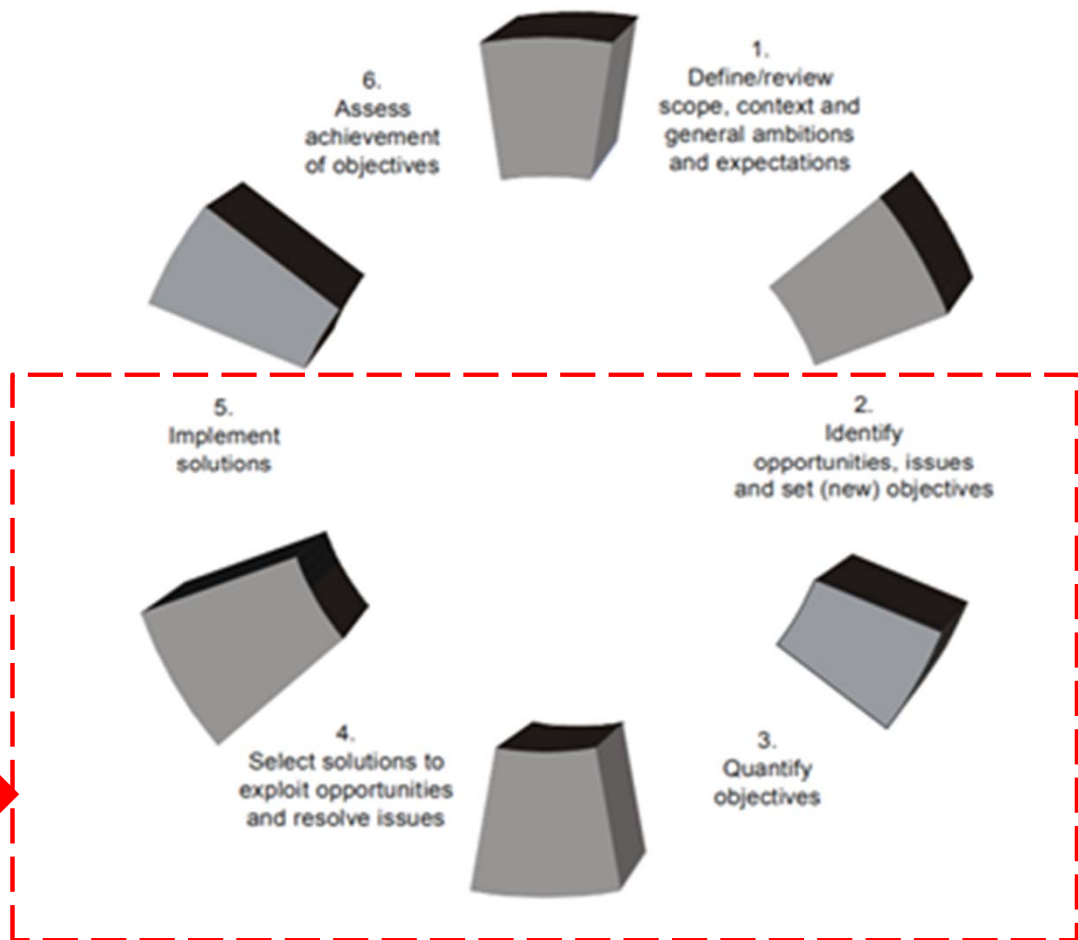


**AN-SPA** (Air Navigation - System Performance Assessment) is an automated tool to guide the user in applying the six-step method locally.



# SIX STEPS METHOD

Select appropriate ASBU or non-ASBU to solve the Improvements opportunity





- Step 1: Define/review scope, context and general ambitions/expectations
  - Step 1.1: Define scope
  - Step 1.2: Define context
  - Step 1.3: Identify ambitions and expectations
- Step 2: Identify opportunities, issues and set (new) objectives
  - Step 2.1: Develop a list of present and future opportunities and issues that require performance management attention
  - Step 2.2: Focus efforts by defining and prioritizing performance objectives as needed

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- Step 3: Quantify objectives
  - Step 3.1: Define how progress in achieving performance objectives will be measured and which data are required to do so
  - Step 3.2: Define the desired speed of progress in terms of baseline and target performance
- Step 4: Select solutions to exploit opportunities and resolve issues
  - Step 4.1: Select the decisive factors to reach the target performance
  - Step 4.2: Identify solutions to exploit opportunities and mitigate the effects of the selected drivers and blocking factors
  - Step 4.3: Select a sufficient set of solutions
- Step 5: Implement solutions
- Step 6: Assess achievement of objectives.



## **Step 1: Define/review scope, context and general ambitions/expectations**

- **Step 1.1: Define scope**
- **Step 1.2: Define context**
- **Step 1.3: Identify ambitions and expectations**



## Step 2: Identify opportunities, issues and set (new) objectives

- **Step 2.1: Develop a list of present and future opportunities and issues that require performance management attention**
- **Step 2.2: Focus efforts by defining and prioritizing performance objectives as needed**



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- KPA 01 — Access and equity
- KPA 02 — Capacity
- KPA 03 — Cost effectiveness
- KPA 04 — Efficiency
- KPA 05 — Environment
- KPA 06 — Flexibility
- KPA 07 — Global interoperability
- KPA 08 — Participation by the ATM community
- KPA 09 — Predictability
- KPA 10 — Safety
- KPA 11 — Security

These are the eleven Key Performance Areas (KPA) stipulated in the Global Air Traffic Management Operational Concept (Doc 9854).



## Enablers

Achievable performance in the areas indicated in 2.2.4.2 is made possible by the following levels of trainers (ENABLERS):

- services and procedures;
- human Resources;
- physical infrastructure;
- systems and technology; and
- regulation and standardization.





2.2.4.4. The performance-based approach can and should be applied to each of these levels of **enablers** in order to understand the impact on the eleven KPAs.

For example, at the systems and technology level, the focus includes the technical performance characteristics of the service or system: availability, continuity, reliability, integrity, recoverability, maintainability, scalability, etc.

An important part of the PBA is the development of cause-effect relationships between these technical performance characteristics and the 11 higher-level KPAs.



## Steps 3, 4, 5 and 6

- Step 3: Quantify objectives;
- Step 4: Select solutions to exploit opportunities and resolve issues;
- Step 5: Implement solutions
- Step 6: Assess achievement of objectives (KPI)



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