

REGIONAL AND NATIONAL APPROACH TO IMPLEMENTATION OF A GLOBAL ATM SYSTEM

SUMMARY

This paper provides guidance to regional and national planning for the implementation of a global ATM system on the basis of performance objectives that is aligned with the Global Air Navigation Plan and Global ATM Operational Concept. The proposed approach will ensure that the work of all regions and States is aligned and will support a more efficient and effective transition.

1. INTRODUCTION

1.1 *Air Navigation Planning process:* The ICAO planning objective is to achieve a performance based global air traffic management (ATM) system through the implementation of air navigation systems and procedures in a progressive, cost-effective and cooperative manner. The regional planning and implementation process is the principal engine of ICAO's planning framework. It is here that the top-down approach comprising global guidance and regional harmonization measures converge with the bottom-up approach constituted by national planning by States.

2. TRANSITION TO A PERFORMANCE BASED APPROACH

2.1 *Basis:* The notion of a performance based air navigation system emanated from good industry practices that have emerged over many years. As the aviation industry has evolved into a less regulated and more corporatized environment with greater accountabilities, the advantages of transitioning from systems based to performance-based planning are apparent.

2.2 *Principles:* The performance-based approach (PBA) adheres to the following principles: strong focus on results through adoption of performance objectives and targets; collaborative decision making driven by the results; and reliance on facts and data for decision making. Assessment of achievements is periodically checked through a performance review, which in turn requires adequate performance measurement and data collection capabilities.

2.3 *Advantages:* Result oriented, transparent and promotes accountability; shift from prescribing solutions to specifying desired performance; employs quantitative and qualitative methods; avoids a technology driven approach; helps decision makers to set priorities, makes the most appropriate trade-offs, and allows optimum resource allocation.

3. ICAO EFFORTS TOWARD IMPLEMENTATION OF A GLOBAL ATM SYSTEM

3.1 *Global guidance:* To facilitate the realization of a performance based Global ATM system, ICAO has made significant progress in the development of relevant guidance material. The intent of the

guidance material is to promote a globally harmonized approach to transition planning and to ensure collaboration in developing air navigation systems and procedures. The documents are as follows:

a) *Global Air Traffic Management Operational Concept (Doc 9854)* was endorsed by the ICAO Eleventh Air Navigation Conference in 2003; it provides the overall vision and direction for the civil aviation community;

b) *The Air Traffic Management System Requirements (Doc 9882)* was developed in June 2007; it elaborates the overall vision into material specifying the functional evolution of ATM aimed at the manufacturing industry;

c) In an effort to assist planners in weighing outcomes and making appropriate decisions, *the Manual on Global Performance of the Air Navigation System (Doc 9883)* was developed in February 2008. This Doc consists of two parts: Part I is the foundation document addressing the basic performance management terminology and techniques that are the common denominator between all performance planning/management applications while Part II provides a broad overview of the tasks that need to be undertaken to adopt a performance based transition approach.

d) *The Global Air Navigation Plan (Doc 9750)*, revised in November 2006, assists States and regional planning groups in identifying the most appropriate operational improvements and supports implementation. It describes a strategy aimed at achieving near and medium term ATM benefits on the basis of available and foreseen aircraft capabilities and ATM infrastructure.

4. REGIONAL PLANNING

4.1 *Mechanism:* The Planning and Implementation Regional Groups (PIRGs) play a pivotal role in facilitating and monitoring the implementation of regional air navigation infrastructure. This paper proposes that PIRGs adopt a methodology described herein for transition to a performance based Global ATM system.

4.2 *Process:* The Figure 1, the planning flow chart, shown in Appendix A (extracted from the Global Air Navigation Plan Doc 9750) in conjunction with figure 2, transition approach, shown in Appendix B (extracted from Part II of the Global Performance Manual Doc 9883), provide a broad overview of the tasks that need to be undertaken by the PIRGs.

4.3 *Performance framework form:* The outcome of the above process would result in an output and management form that has been designated as “Performance Framework Form (PFF)”. A sample PFF, which has been standardized and shown in Appendix C hereto is applicable to both regional and national planning framework. The common template ensures easy understanding and harmonization. The explanatory notes provided in Appendix C serve as guide for completing the PFF.

4.4 *Monitoring and reporting:* PIRGs should identify the individual parties responsible for achieving the performance objectives and establish a monitoring mechanism. The responsibilities and timeframe should be clearly defined so that the involved parties are aware of their commitments throughout the planning process. Regional plans should include information on progress achieved and provide periodic reports to ICAO Headquarters.

5. NATIONAL PLANNING

5.1 *Process:* In terms of establishing the infrastructure for air navigation systems, States, in cooperation with the ATM community, have been developing their national plans in harmony with the regional plan by using relevant ICAO guidance material. States should evolve or develop national plans aligned with the regionally agreed performance objectives through the use of common template described in Appendix C.

The tasks should include the necessary detailed actions so as to successfully achieve national performance objectives.

5.2 *Monitoring and reporting:* National plans should identify the individual parties responsible for achieving the performance objectives as well as a means for monitoring the progress. The responsibilities and timeframe should be clearly defined so that the involved parties are aware of their commitments throughout the planning process. National plans should include information on progress achieved and provide periodic reports to PIRGs.

6. **Conclusion**

6.1 *Evolutionary approach:* A global ATM system will emerge through the implementation of many initiatives over several years on an evolutionary basis. The set of initiatives contained in the Global Plan are meant to facilitate and harmonize the work already underway within the regions and States so as to bring needed benefits to aircraft operators over the near and medium terms. ICAO will continue to develop newer initiatives on the basis of the operational concept. Subsequently these will be placed in the Global Plan. At first, the planning and implementation activities begin with application of available procedures, processes and capabilities. The evolution progresses to the application of emerging procedures, processes and capabilities and ultimately, migrates to the ATM system based on the operational concept.

6.2 *Recommendations:* Considering the need to have a clearly defined strategy to implement ATM systems as well as the need to align work programmes of the States, regions and ICAO Headquarters, it is recommended to adopt a performance framework on the basis of ICAO guidance material and ensure their alignment with the regional performance objectives, the regional air navigation plan and the Global ATM Operational Concept. The performance framework should include identification of national performance objectives and completion of national performance framework forms.

APPENDIX A

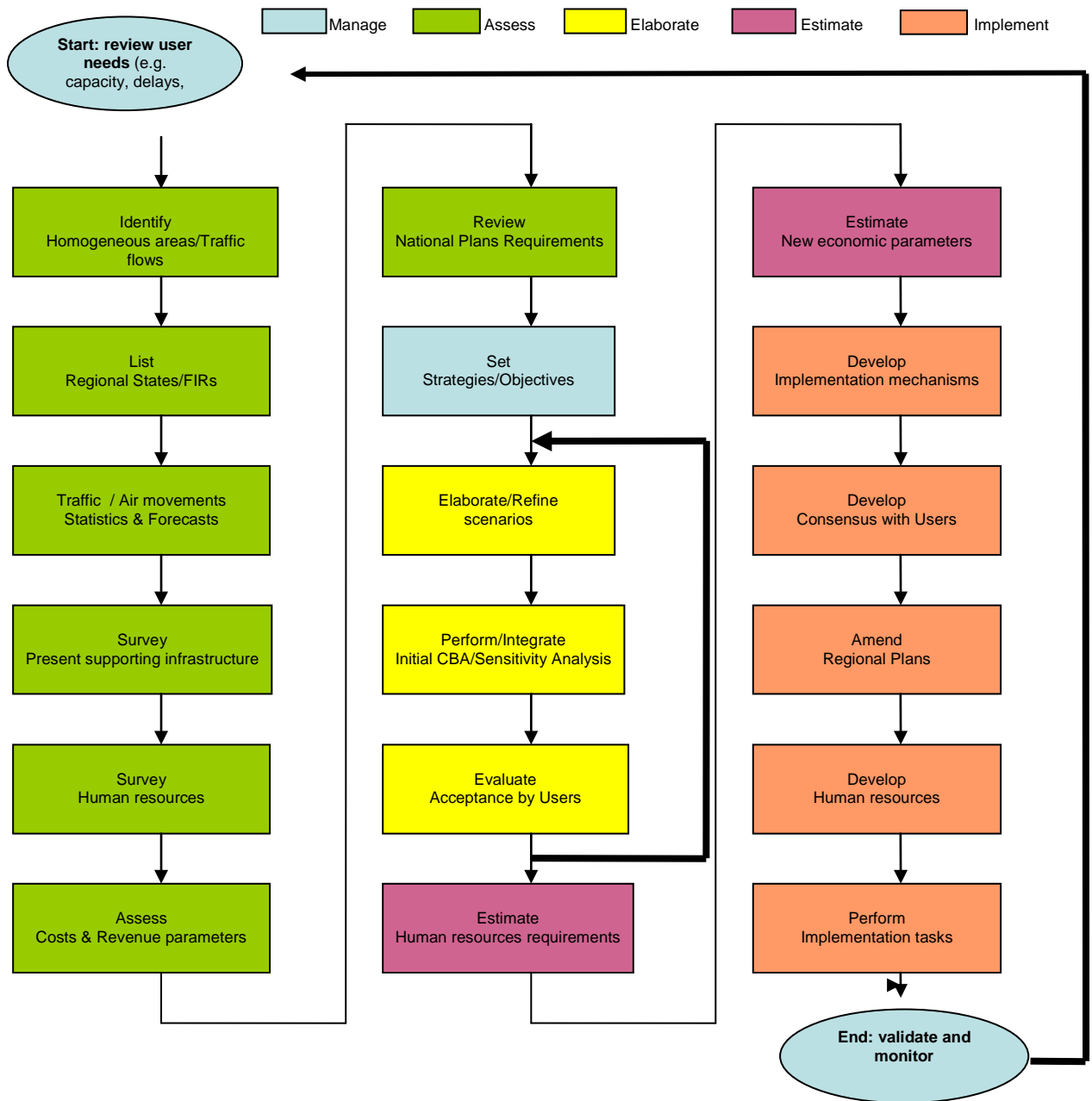


Figure 1. Planning flow chart

Extracted from Global Air Navigation Plan -Doc 9750, Chapter 1

APPENDIX B

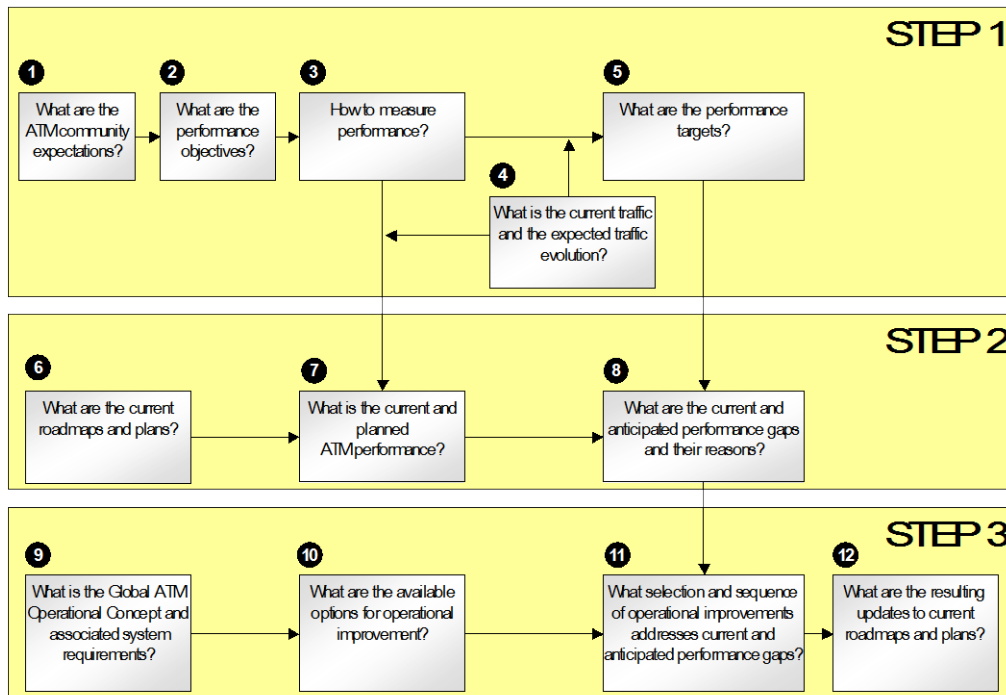


Figure 2 – Performance-based transition approach

Extracted from Part II of the
Manual on Global Performance of the Air Navigation System-Doc 9883

APPENDIX C

**PERFORMANCE FRAMEWORK FORM
(a sample)**

REGIONAL PERFORMANCE OBJECTIVES /NATIONAL PERFORMANCE OBJECTIVES — OPTIMIZE THE ATS ROUTE STRUCTURE IN EN-ROUTE AIRSPACE				
Benefits				
Environment Efficiency	<ul style="list-style-type: none"> • reductions in fuel consumption; • ability of aircraft to conduct flight more closely to preferred trajectories; • increase in airspace capacity; • facilitate utilization of advanced technologies (e.g., FMS based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency. 			
<i>Strategy</i> Short term (2010) <i>Medium term (2011 - 20015)</i>				
ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILIT Y	STATUS
AOM	<p align="center"><i>En-route airspace</i></p> <ul style="list-style-type: none"> • analyze the en-route ATS route structure and implement all identifiable improvements; • implement all remaining regional requirements (e.g. RNP 10 routes); and • finalize implementation of WGS-84 • monitor implementation progress • develop a strategy and work programme to design and implement a trunk route network, connecting major city pairs in the upper airspace and for transit to/from aerodromes, on the basis of PBN and, in particular, RNAV/5, taking into account interregional harmonization; • monitor implementation progress 	2005-2008		
linkage to GPIs	GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: FMS-based arrival procedures.			

PERFORMANCE FRAMEWORK FORM - EXPLANATORY NOTES

1. **Performance framework form:** This form is an output and management form which is applicable to both regional and national planning and includes references to the Global Plan. Other formats may be appropriate but should contain as a minimum the elements described below
2. **Performance objective:** Regional /national performance objectives should be developed using a performance based approach that best reflects the necessary activities needed to support regional/national ATM systems. During their life cycle, performance objectives may change depending on the ATM system's evolution; therefore, throughout the implementation process, these should be coordinated with and be available to all interested parties within the ATM Community. The establishment of collaborative decision making processes ensures that all stakeholders are involved in and concur with the requirements, tasks and timelines.
3. **Regional performance objective:** Regional performance objectives are the improvements required to the air navigation system in support of the global performance objectives, and are related to the operating environments and priorities applicable at the regional level.
4. **National performance objective:** National performance objectives are the improvements required to the air navigation system in support of the regional performance objectives, and are related to the operating environments and priorities applicable at the State level.
5. **Benefits:** The regional/national performance objectives should meet the expectations of the ATM community as described in the operational concept and should lead to benefits for stakeholders and be achieved through operational and technical activities aligned with each performance objective.
6. **Strategy:** ATM evolution requires a clearly defined progressive strategy including tasks and activities which best represent the national and regional planning processes in accordance with the global planning framework. The goal is to achieve a harmonized implementation process evolving toward a seamless global ATM system. For this reason, it is necessary to develop short (1 to 5 years) and medium term (6 to 10 years) work programmes, focusing on improvements to the system indicating a clear work commitment for the parties involved.
7. **ATM operational concept components;** Each strategy or set of tasks should be linked with associated components of the ATM operational concept. The designators for ATM components are as follows:
 - AOM – Airspace organization and management
 - DCB – Demand and capacity management
 - AO – Aerodrome operations
 - TS – Traffic synchronization
 - CM – Conflict management
 - AUO – Airspace user operations
 - ATM SDM – ATM service delivery management
8. **Tasks:** The regional/ national work programmes, using this PFF templates, should define tasks in order to achieve the said performance objective and at the same time maintain a direct relation with ATM system components. The following principles should be considered when developing work programme:

- The work should be organized using project management techniques and performance-based objectives in alignment with the strategic objectives of ICAO.
 - All tasks involved in meeting the performance objectives should be developed using strategies, concepts, action plans and roadmaps which can be shared among parties with the fundamental objective of achieving seamlessness through interoperability and harmonization.
 - The planning of tasks should include optimizing human resources as well as encouraging dynamic use of electronic communication between parties such as the Internet, videoconferences, teleconferences, e-mail, telephone and facsimile. Additionally, resources should be efficiently used, avoiding any duplication or unnecessary work.
 - The work process and methods should ensure that performance objectives can be measured against timelines and the national and regional progress achieved can be easily reported to PIRGs and ICAO Headquarters respectively.
9. **Timeframe:** Indicates start and end time period of that particular task(s).
10. **Responsibility:** Indicates the organization/entity/person accountable for the execution or management of the related tasks.
11. **Status:** The status is mainly focused on monitoring the progress of the implementation of that task(s) as it progresses toward the completion date.
12. **Linkage to global plan initiatives(GPIs):** The 23 GPIs, as described in the Global Plan, provide a global strategic framework for planning for air navigation systems and are designed to contribute to achieving the regional/national performance objectives. Each performance objective should be mapped to the corresponding GPIs. The goal is to ensure that the evolutionary work process at the State and regional levels will be integrated into the global planning framework.

— END —