



**Performance Framework for
Air Navigation Systems**

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AIR NAVIGATION COMMISSION
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Overview

- Background
- Performance Framework
- Monitoring and Measurement
- Rollout
- Challenges
- Way forward

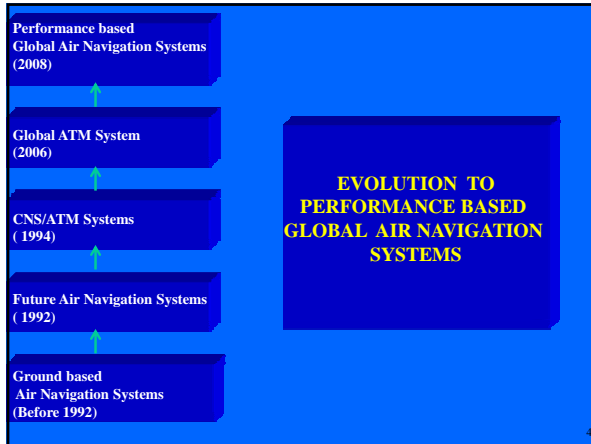
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~ Vision Statement ~
ICAO/ATM Community members

To achieve an interoperable **global ATM System** for all users during all phases of flight that:

- meets agreed levels of **safety**
- provides for optimum **economic** operations
- is **environmentally** sustainable
- meets national **security** requirements

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Global ATM System

It is a worldwide system which:

- facilitates interoperability of different technologies;
- accommodates different procedures;
- covers all elements of AN systems (ATM, CNS, AGA, AIM and MET); and
- provides harmonization

thus leading to seamlessness across regions.

This is achieved through progressive, cost effective and cooperative implementation of air navigation systems worldwide.

Operation of airports and air navigation services

Organization issues in the 1990s

- The Council recommends that where economically viable and in the best interest of providers (airports and ANSPs) and users, States consider establishing autonomous entities to operate their airports or air navigation services. (Paragraphs 11-14 of Doc 9082 regarding autonomy and privatization refers)
- Many States in 1990/early 2000s established autonomous entities for the provision of air navigation services, known as ANSPs.
- ANSConf 2000, Recommendation 2/1, also empathized and called upon States to establish autonomous entities to operate their airports and air navigation services.

Eleventh Air Navigation Conference
September 2003

- Endorsed the global ATM operational concept
- Noted that corporatization and a more structured regulatory environment were placing increasing pressure on accountability
- Urged ICAO to develop a performance framework for Air Navigation Systems

35th Session of the ICAO Assembly
September 2004

- Called upon States, PIRGs and the aviation industry to use the ICAO Global ATM Operational Concept as the common framework
- Requested ICAO to develop the transition strategies, ATM requirements and SARPs necessary to support implementation of a global ATM system
- Urged ICAO to ensure that the future global ATM system is performance based and that the performance objectives and targets for the future system are developed in a timely manner

Documentation developed for Performance Planning (1/3)

Document	Description	Objective	Role	Guidance
ATM Operational Concept (Doc 9854) (Available on ICAONET)	The ATM Operational Concept (ATMOC) presents the ICAO vision of an integrated, harmonized global air traffic management system. The planning horizon is up to and beyond 2025.	To achieve an interoperable global air navigation system, for all users during all phases of flight, that meets agreed levels of safety, provides for optimum economic operations, is environmentally sustainable and meets national security requirements.	Vision	ATM System Requirements document (Doc 9882) (Available on ICAONET), will ensure that all ATM related standards making and industry work will be in support of the operational concept.

Documentation developed for Performance Planning (2/3)				
Document	Description	Objective	Role	Guidance
Global Air Navigation Plan (Doc 9750) (Available on ICAONET)	Strategic document that describes the methodology for global air navigation harmonization.	Establishes the focus for near and medium term activities.	Strategy	Manual on Global Performance of the Air Navigation System (Doc 9883) (available on ICAONET). Part I provides a comprehensive understanding of the intent, expected benefits and delivery mechanisms of the performance based air navigation system and provides guidance on measuring and evaluating ATM performance; Part II provides transition strategies and supports the Global Plan as a transition planning document.
Global Plan Initiatives (Part of Global Plan)	A set of implementation methodologies derived from operational environment.	Measurable progress towards the implementation of the ATMOC.	Tactical	

Documentation developed for Performance Planning (3/3)				
Document	Description	Objective	Role	Guidance
Regional Plans (Available on ICAONET)	Regional work programmes including the planning and monitoring of the detailed activities and their timelines which, inter alia, lead to the realization of a global air traffic management system as envisaged in the operational concept.	Contains the performance directives and associated requirements for facilities and services, established through regional air navigation agreements, in support of the global air navigation infrastructure.	Action	ICAO Business Plan (Available on ICAONET)

Performance Framework Principles

- **Focuses on results**
 - through adoption of performance objectives and targets
- **Encourages collaborative decision making**
- **Relies on facts and data for decisions**
- **Emphasizes on performance monitoring**

**Performance Framework
Requirements**

- Once an organization, State or a region has adopted performance based planning, it must acknowledge the following :
 - Commitment (*at the top*)
 - Agreement on goals (*desired results*)
 - Responsibility (*who is accountable*)
 - Human resources and know-how (*Culture & Skills*)
 - Data collection, processing, storage and reporting
 - Collaboration and coordination (*with other partners*)
 - Cost implication (*what does it cost*)

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**Performance Framework
Advantages**

- Result oriented, transparent and promotes accountability
- Shift from prescribing solutions to specifying performance
- Employs quantitative and qualitative methods
- Avoids a technology driven approach
- Allows optimum resource allocation

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**Performance Framework
Terminology (1/3)**

- **Expectation or Key Performance Area**
 - 11 high level expectations are defined in the OCD (Access/Equity, Capacity, Cost-effectiveness, Efficiency, Environment, Flexibility, Global interoperability, Participation by the ATM community, Predictability, Safety and Security)
- **Focus Area**
 - Focus areas may be defined as areas where performance must be addressed in a any given KPA. For example, in the safety KPA, focus may be in such areas as CFIT accidents, runway incursions. For capacity, focus area could be enroute airspace or terminal airspace.

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Performance Framework Terminology (2/3)

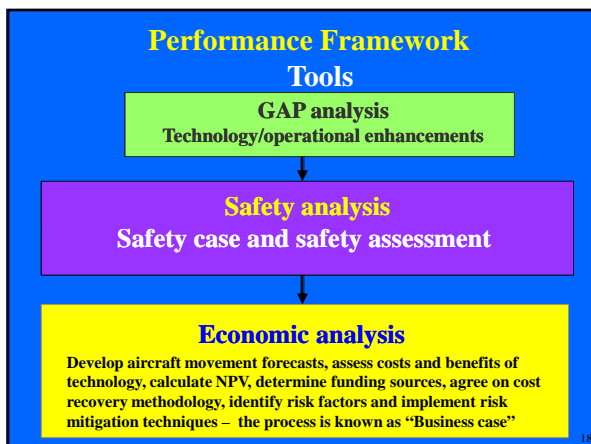
- **Performance Objective**
 - Each expectation should be reached through a set of specific, measurable, achievable, relevant and timely (SMART) performance objectives
 - Performance Objectives is defined in a qualitative way - a desired trend from today's performance (e.g. improvement), within a well specified ATM planning environment. In other words it is a high level statement of outcome that satisfies ATM community expectations. Example : Enhance terminal airspace capacity.
- **Performance Indicator**
 - Indicators are defined when there is a need to document current performance levels and progress in achieving an objective. It is a measure of achievement of performance objective. Example: Reduction in separation standards is an indicator for increase in airspace capacity.

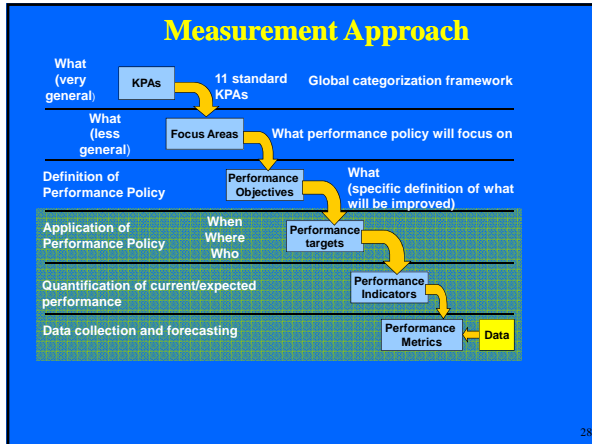
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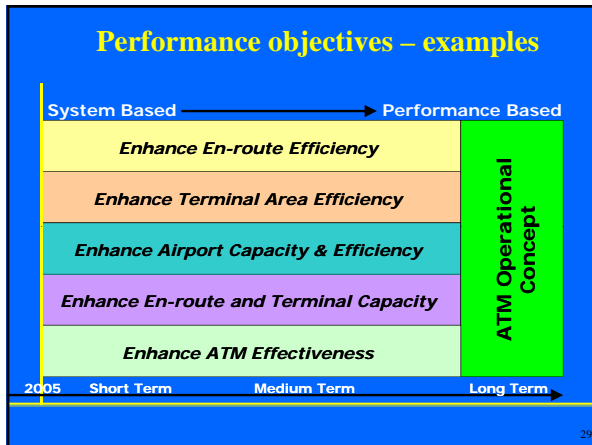
Performance Framework Terminology (3/3)

- **Performance Target**
 - A set of agreed numerical values of related performance indicators, representing the minimum performance levels at which an objective is considered to be 'achieved'.
 - Example: Ten percent increase in the capacity of terminal airspace.
- **Performance Metric**
 - A generic definition of what can be measured, how it can be measured and in which context and scope this should be done. Metrics are quantitative measures of system performance – how well the system is functioning
 - Example: Traffic volume, number of city pair flights, airspace throughput.

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Indicators and Metrics – examples (1/3)

Indicators	Metrics
Flexibility: number of user preferred route requests granted	> The percentage of flights subject to an Air Traffic Control (ATC) preferred route
Flexibility: reduced deviation between route requested and route flown	> Number of flights whose maximum altitude equalled the requested altitude in their flight plans > Excess time from top of descent to wheels down > Mean lateral deviation between the flight planned and the actually flown route
Predictability: Reduced impact of system outages	> Total of number of cancellations and diversions at major airports within the affected area > Total delay of departures > total difference between scheduled and actual arrival times

Indicators and Metrics – examples (2/3)

Indicators	Metrics
Access: airports with precision approach capability	➤ The number of airports that have at least one precision approach
Access: civilian utilization of special use airspace	➤ Percentage of flights that use special use airspace
Capacity: Reduced ground movement times at key airports during peak operations	➤ Monthly average taxi in and taxi out times at 25 major airports.

Indicators and Metrics – examples (3/3)

Indicators	Metrics
Safety: Avoidance of accidents	➤ number of accidents per 100,000 departures
Cost effectiveness: Minimizing operating costs	➤ Total operating cost plus cost of capital divided by IFR flights
Capacity: increase in air cargo capacity	➤ Tons of cargo per year

**Performance Framework
Flight Safety**

- Performance Framework Process is the same for safety and efficiency
- PFFs for Flight safety (FS) issues were developed and presented to AFI Special RAN meeting in November 2008. Also OPS section is working closely with RASG-PA on PFFs
- For Performance planning related to FS:
 - Reference is made to Global Aviation Safety Plan (GASP)
 - Linkage is shown to Global Safety Initiatives (GSIs)
 - Projects are drawn from Global Aviation Safety Road Map (GASR)
 - Metrics are identified by the outcome

**Performance Framework
Rollout (2008-2009)**

- All the PIRGs have adopted performance driven approach to planning and implementation of air navigation systems. In turn, all the PIRGs have called upon States to develop performance driven plans
- Conducted Performance workshops for the States of CAR/SAM/MID/ASIA/PAC regions
- All the PIRGs have finalized the regional performance objectives
- States in Middle East, Asia/Pacific, Europe and CAR/SAM regions are progressing well in developing performance driven national plans

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**Performance Framework
Challenges**

- Need to increase performance awareness
- States in the AFI and Eastern part of the European Region require further support for transition to performance based planning
- In terms of performance framework for flight safety, regions require additional guidance
- Establishing a process by States for data collection/analysis of performance metrics is a challenging task

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**Performance Framework
Way forward: 2010-2011 (1/4)**

- Workshops are planned for the AFI and Eastern part of the European Regions in 2010
- PIRGs/Regions continue to use performance based approach in all subgroup/taskforce meetings thus increasing performance awareness of States
- Next steps call for performance monitoring and measurement
 - All PIRGs are being requested to identify suitable metrics and call upon States and international organizations to establish a process to collect data, process and submit to the regional office (APANPIRG has already completed this task)
 - HQ to determine a set of common metrics for all regions

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Performance Framework

Way forward: 2010-2011 (2/4) – ATB initiatives

- ✓ Introduction of a new Form on Accidents and serious incidents of civil aircraft, consistent with ADREP standards.
- ✓ Implementation of a form on aviation personnel licenses and training capacities.
- ✓ Collection of aircraft movements data annually from ANSPs through States, in close collaboration with CAEP for an update of their Common Operations Database (COD) with a view to avoiding duplication.
- ✓ Introduction of a new collection process on fuel consumption by commercial air carriers as per GIACC recommendation.
- ✓ Data requirement needs in terms of airport capacity constraints that could be induced by continuous air traffic growth.

Performance Framework

Way forward: 2010-2011 (3/4)

- Proposed to introduce at the very beginning of every PIRG meeting, a regional performance report (RPR) of air navigation systems
 - This RPR will provide an annual progress report in both qualitative and quantitative terms
 - It will highlight the issues/challenges and also suggest solutions in achieving performance objectives
- In consultation with Regional Offices and PIRGs, a standardized format for this RPR will be developed
- Regional Offices with the assistance of the OPS section will address the performance driven plan for safety

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Performance Framework

Way forward: 2010-2011 (4/4) – TCB initiatives

- Technical Cooperation approach to Performance based projects
 - Regional project: performance based planning and implementation of air navigation systems for Caribbean region is in progress – to be launched in April 2010
 - National project: performance based planning workshops – to be launched in February 2010 for India
 - Training centres: introduction of PBA in CATC training programmes – coordination is in progress with CATC, Thailand

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