



# ***Module 2***

## ***ANS Performance Measurement/Transition to a performance based environment***

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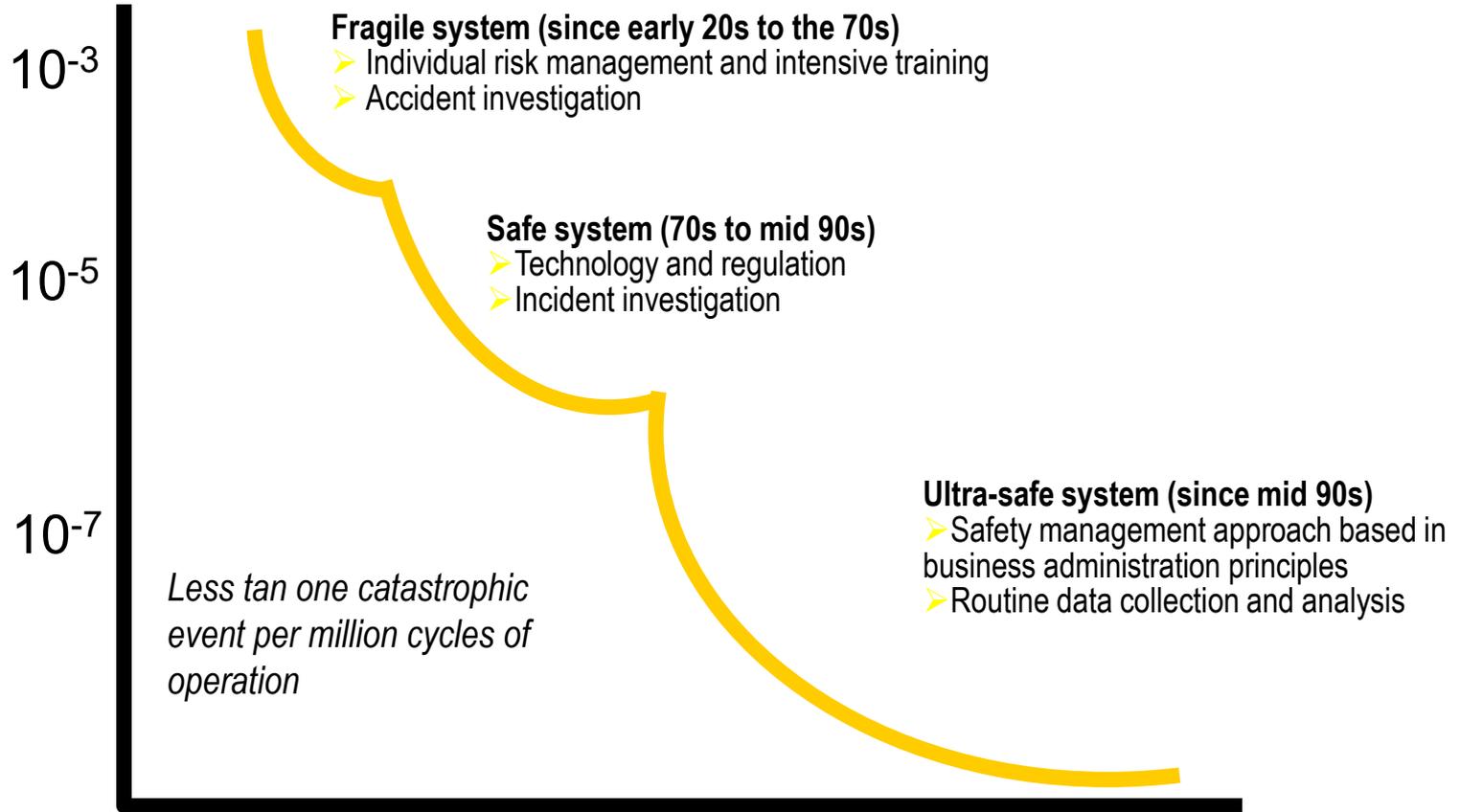
*ATM/SAR Regional Officer  
ICAO NACC Regional Office*



**CAR Virtual workshop for the preparation of the CAR/SAM/ANP-VOL III**  
***Online from 14 to 18 February 2022***



# The first ultra-safe industrial system







## Objectives

- ✈ Recognize the principles that characterize a performance-based air navigation system.
- ✈ Provide “getting started” assistance to those ATM community members who are (relatively) inexperienced in this subject; and
- ✈ Assist the experienced ATM community members in converging towards a globally harmonized and agreed upon approach.



# Central America -Caribbean

## ✈️ Aviation essential for further development

- ✈️ Many small economies in the Caribbean, particularly the tourism-dependent economies, have been growing faster in the last three years. GDP growth rates in 2017 averaged 1.7 percent in service-oriented economies. The Dominican Republic did even better, growing by an estimated 4.6 percent. Others did not fare so well. Belize, Suriname, and Trinidad and Tobago continue to face the aftershocks of the 2014 drop in world prices for oil and other commodities

## ✈️ Agriculture, travel and tourism

## ✈️ Climate change and natural disasters

## ✈️ Reduce operation costs



## What are ATM Expectations?

Meeting the expectations of the aviation community:

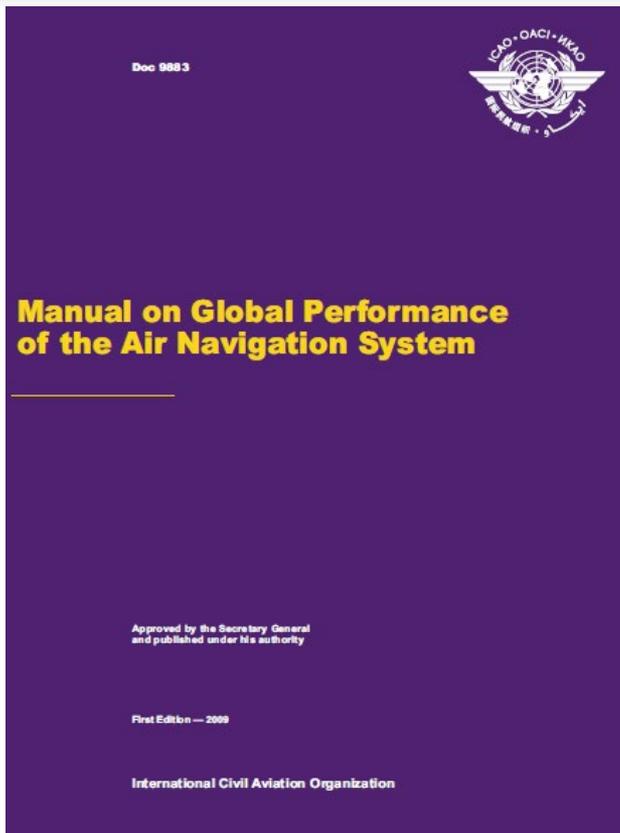
- ✈ meeting safety objectives
- ✈ operate along preferred 4D trajectories (business trajectories)
- ✈ scheduling
- ✈ gate availability
- ✈ environmental objectives
- ✈ other business requirements



# The Role of States and PIRGs

11th Air Navigation Conference in 2003

- ✈ States and PIRGs consider the Global Air Navigation Plan for CNS/ATM Systems as a catalyst for change, providing a global safety and interoperability framework while allowing regional or local adaptation to efficiently meet regional and local needs
- ✈ That States and PIRGs agree on a set of metrics related to key performance areas, incorporate these metrics into the performance monitoring process and review their results on a regular basis



- ✈ The notion of a performance-based air navigation system emanated from sound industry practices external to the aviation industry.
- ✈ The expected result is a more efficient system through identified cost savings, reduction in the waste of resources, more equitable charging practices, and more efficient provision of services.
- ✈ As the work effort is challenging and requires a globally coordinated effort, the aviation community should be encouraged to follow a common approach toward the development and implementation of a performance-based air navigation system.
- ✈ The PBA can be applied in economic management, transition management, safety management, security management, communications, etc.

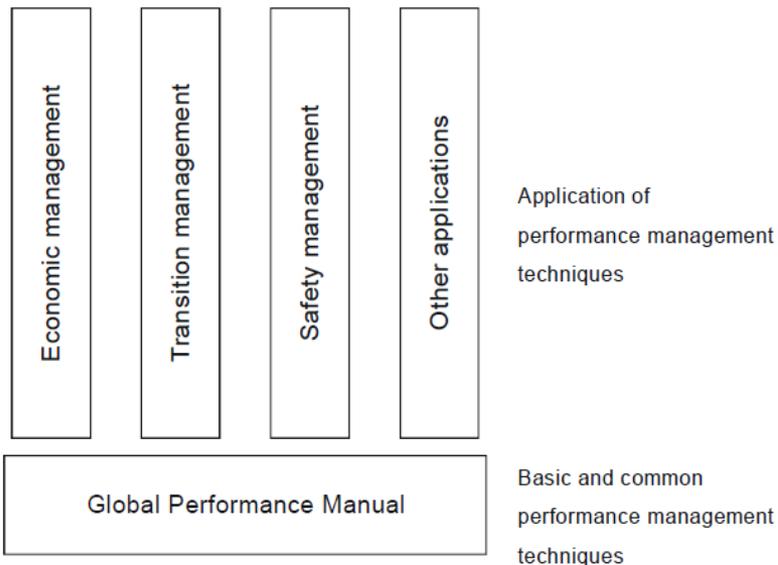
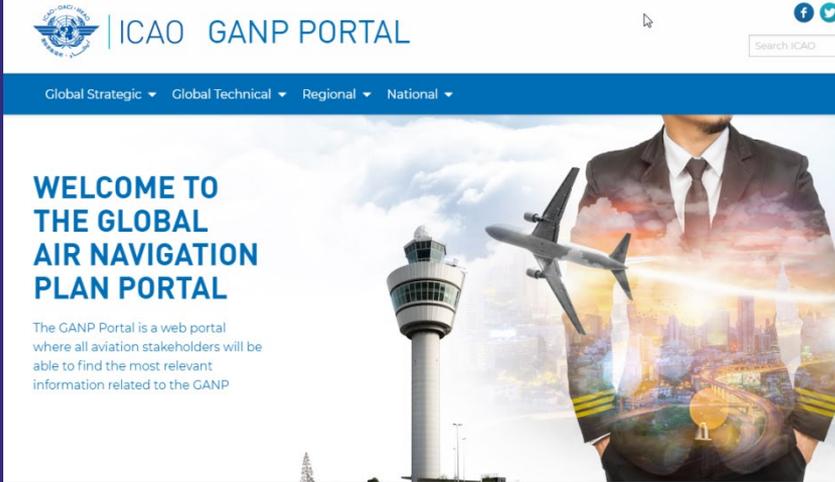
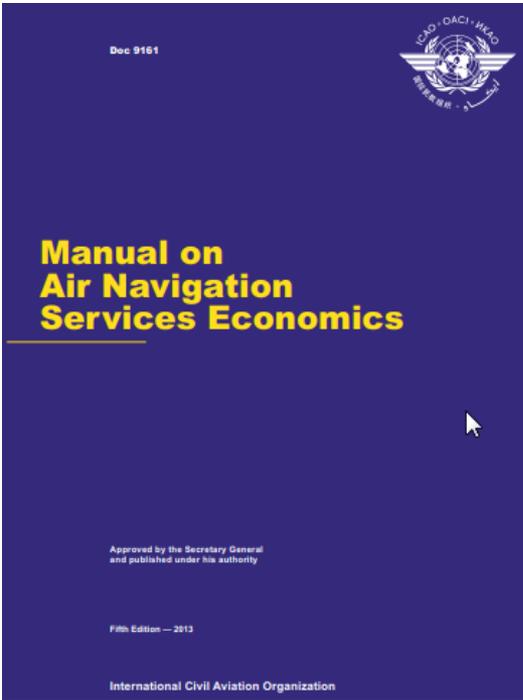


Figure I-1-1. Role of the global performance manual

- ✈ This manual addresses the basic performance management terminology and techniques that are the “common denominator” between all performance planning/management applications.
- ✈ The specifics of each application are addressed in other related documents, including but not limited to the:
  - ✈ — Manual on Air Navigation Services Economics (Doc 9161)
  - ✈ — Global Air Navigation Plan (Doc 9750)
  - ✈ — Safety Management Manual (SMM) (Doc 9859)





# Terminology

## ✈ Performance-based approach (PBA).

- ✈ The performance-based approach is a decision-making method based on three principles: strong focus on desired/required results; informed decision-making driven by those desired/required results; and reliance on facts and data for decision-making. The PBA is a way of organizing the performance management process

## ✈ Performance framework.

- ✈ A performance framework is the set of definitions and terminology describing the building blocks used by a group of ATM community members to collaborate on performance management activities.

## ✈ Performance indicator.

- ✈ Current/past performance, expected future performance, as well as actual progress in achieving performance objectives is quantitatively expressed by means of indicators (sometimes called key performance indicators, or KPIs).
- ✈ To be relevant, indicators need to correctly express the intention of the associated performance objective. Since indicators support objectives, they should be defined having a specific performance objective in mind.
- ✈ Indicators are not often directly measured. They are calculated from supporting metrics according to clearly defined formulas, e.g.  $\text{cost-per-flight-indicator} = \frac{\text{Sum}(\text{cost})}{\text{Sum}(\text{flights})}$ . Performance measurement is therefore done through the collection of data for the supporting metrics.



# Terminology

## ✈ Performance objective.

- ✈ Within focus areas, the potential intention to establish performance management is “activated” by defining one or more performance objectives. These define — in a qualitative and focused way — a desired trend from today’s performance (e.g. improvement).
  - ✈ **Generic objectives** specifically focus on what has to be achieved, but do not make statements about the when, where, who or how much. For example “improve safety” is not specific enough to be an objective, whereas “reduce the total number of accidents” and even more specifically “reduce the number of CFIT accidents” would qualify as performance objectives. Because at the level of generic objectives no mention is made about the when, where and who, it does not make sense to try to associate numbers (indicator values or targets) with this level.
  - ✈ **Instantiated objectives** add the when, where, who and how much to the generic objectives. Instantiated objectives can have indicator values and associated targets (Chapter 2, 2.3.3, Appendix A, Figure I-A-2, 3.5 and 3.6 refer).

## ✈ \*Key performance area (KPA).

- ✈ KPAs are a way of categorizing performance subjects related to high-level ambitions and expectations. \*ICAO has defined 11 KPAs: safety, security, environmental impact, cost effectiveness, capacity, flight efficiency, flexibility, predictability, access and equity, participation and collaboration, interoperability.



## Performance-based Approach (PBA)

PBA is based on the following principles:

- ✈ strong focus on desired/required results through adoption of performance objectives and targets
- ✈ informed decision-making, driven by the desired/required results
- ✈ reliance on facts and data for decision-making.



## Strong focus on desired/required results

- ✈ Instead of prescribing **solutions**, desired/required **performance** is specified.
- ✈ The attention of management is shifted from a resource and solution-centric view (How will we do it?) towards a primary focus on desired/required performance results (*What is the outcome we are expected to achieve?*).
- ✈ This implies determining
  - ✈ the current performance situation,
  - ✈ what the most appropriate results should be, and
  - ✈ clarifying who is accountable for achieving those results.



# Informed decision-making (driven by the desired/required results)

- ✈ *“Informed decision-making”* requires that decision-makers develop a good understanding of the mechanisms which explain how drivers, constraints, shortcomings, options and opportunities influence (i.e. contribute to, or prevent) the achievement of the desired/required results.
  - ✈ This means working “backwards” from the “what”—the primary focus—to decisions about the “how”.
- ✈ Only then can decisions — in terms of priorities, trade-offs, selection of solutions and resource allocation — be optimized to maximize the achievement of the desired/required (*performance*) results.



# Reliance on facts and data for decision-making

- ✈ In the performance-based approach the desired/required results, as well as the drivers, constraints, shortcomings and options, are expressed in quantitative terms and in a qualitative way.
- ✈ The rationale for this is that “if you can’t measure it, you can’t manage it”, i.e. unless you measure something, you don’t know if it is getting better or worse.
- ✈ When facts and data are used, they should be relevant and reflect reality.
  - ✈ This requires the adoption of a performance measurement culture.
  - ✈ It also necessitates associated investments in data collection and management.



# Performance-based Approach (PBA)

## *Advantages*

- ✈ it is result-oriented, allows customer focus and promotes accountability;
- ✈ the shift from prescribing solutions to specifying desired/required performance also gives more freedom and flexibility in selecting suitable solutions, which in turn is a catalyst for more cost effectiveness.
- ✈ exclusive bottom-up approaches (“technology-driven approach” and “solutions searching for a problem to solve”) are easier to avoid;
- ✈ reliance on anecdotal evidence can be replaced by a rigorous scientific approach employing quantitative and qualitative methods;
- ✈ the focus on desired/required results helps decision-makers set priorities, make the most appropriate trade-offs, choose the right solutions and perform optimum resource allocation;
- ✈ organizations are successful in reaching goals, i.e. the general effect of the approach is that it ensures improved predictability of benefits;
- ✈ it is worth the investment: the adoption of a performance-based approach typically results in cost savings (cost avoidance).



# Performance-based Approach (PBA)

## *Applicability*

- ✈ The PBA can and should be used in subject areas such as:
  - ✈ safety, security, environmental impact of air transport and ATM;
  - ✈ economic performance of airspace users, airports and air navigation service providers;
  - ✈ operational performance (including quality of service) of flight operations, airport operations and the provision of air navigation services;
  - ✈ human performance and social factors within the air navigation system; and
  - ✈ performance of technical systems within the air navigation system
- ✈ It can and should be used in all of the following planning and management activities:
  - ✈ policymaking;
  - ✈ planning;
  - ✈ research, development and validation;
  - ✈ economic management; and
  - ✈ operational management.
- ✈ It can and should be used by all ATM community members:
  - ✈ air navigation service providers (ANSPs);
  - ✈ airports;
  - ✈ airspace users;
  - ✈ manufacturers;
  - ✈ regulators;
  - ✈ States; and
  - ✈ ICAO (including panels and planning groups).



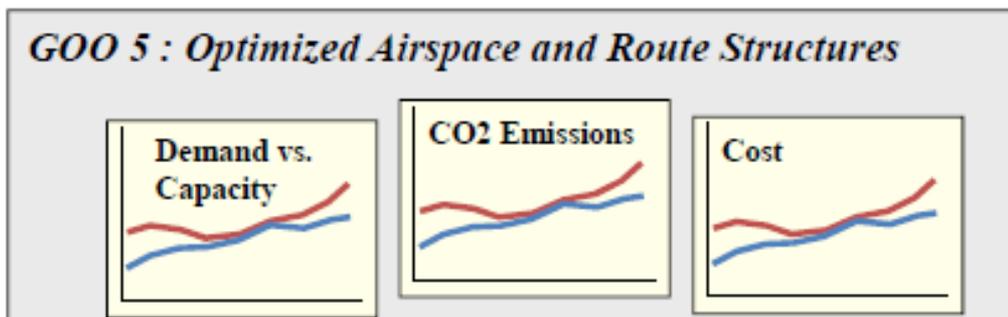
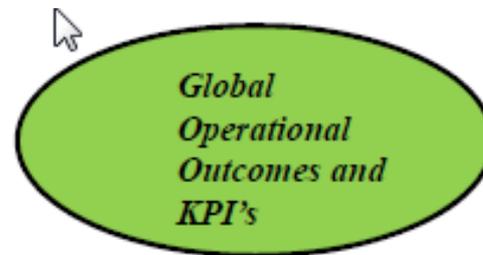
# Performance-based Approach (PBA)

## *THE WAY TO SUCCESS*

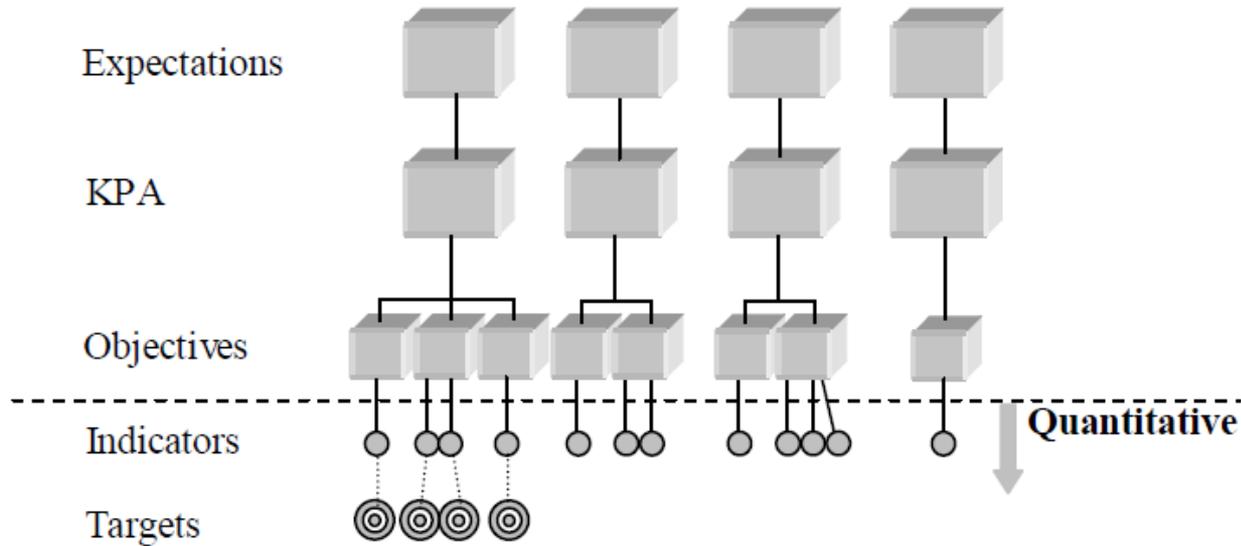
- ✈ Once an organization (or State, region, etc.) decides to adopt the performance-based approach in a particular subject area, it must acknowledge that a number of elements are essential to the successful application of the approach.
- ✈ These elements are:
  - commitment;
  - agreement on goals;
  - organization;
  - human resources and knowledge/expertise;
  - data collection, processing, storage and reporting;
  - collaboration and coordination; and
  - cost implications.

# How to Understand Performance

- ✈ The past and now:
  - Performance Review
    - (performance) Data capturing
    - Data analysis (trends)
    - Reporting
- ✈ How to improve:
  - Performance Planning
    - Understanding performance impact
    - Validation



# Performance Measurement



Objective is met when indicators meet or exceed targets

# Key Message

- ✈ Understanding Performance is key for successful transition from past and current to the future
- ✈ Working under one common umbrella
  - ✈ Performance based transition
  - ✈ Continued operational improvements
  - ✈ Toward a common vision





Questions?



Answers





# ICAO CAPACITY & EFFICIENCY



THANK YOU!