

**SIP/2009-
WP/15A
Performance
Framework**



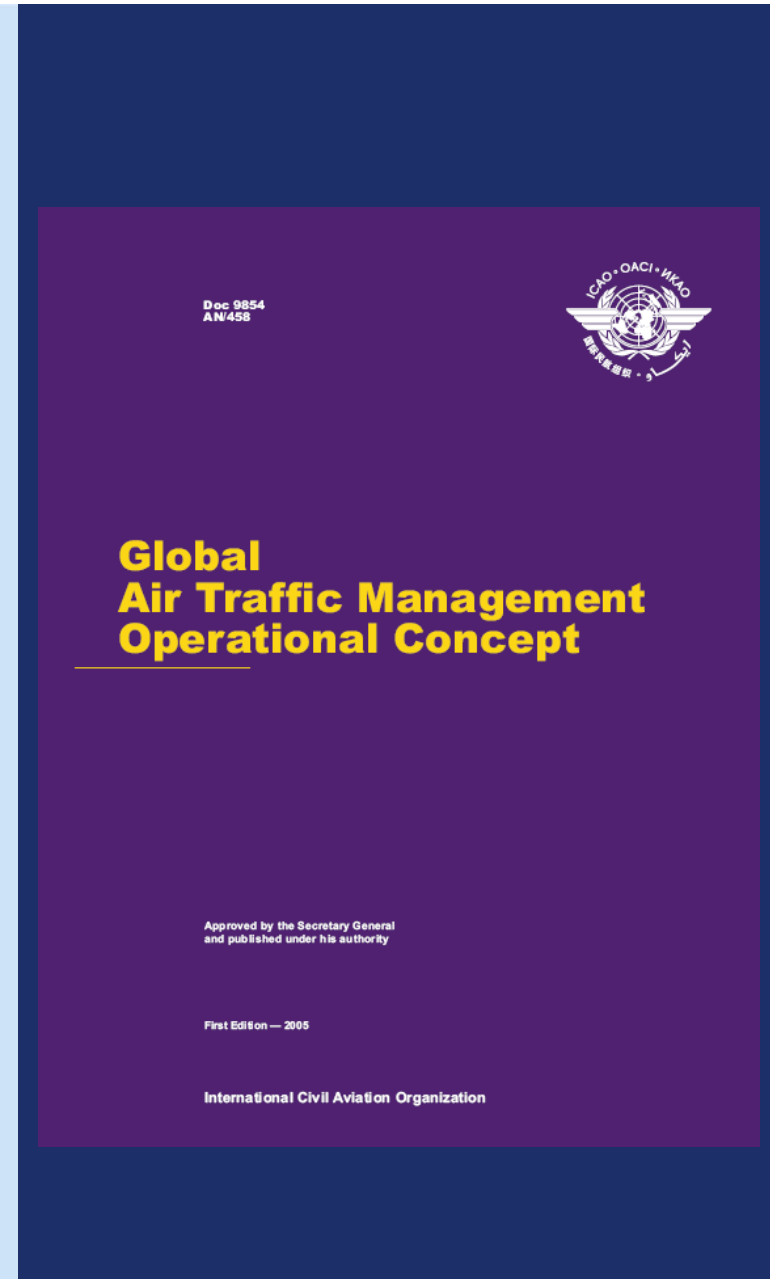
Global Air Navigation System Performance Based Air Navigation Performance Framework Hierarchy

**Jim Nagle, Chief CNS/AIRS
International Civil Aviation Organization**

**Workshop on the Development of
National Performance Framework
(Lima, 13-17 April 2009)**

The Global ATM Operational Concept

- Endorsed by 35th Session of the Assembly
- Vision:
 - ✓ Globally interoperable
 - ✓ All users & flight phases
 - ✓ Safe, economic, environmental & secure
- ATM user expectations are drivers for change, requiring:
 - ✓ Safety case
 - ✓ Business case
- Foundation for ATM System Requirements

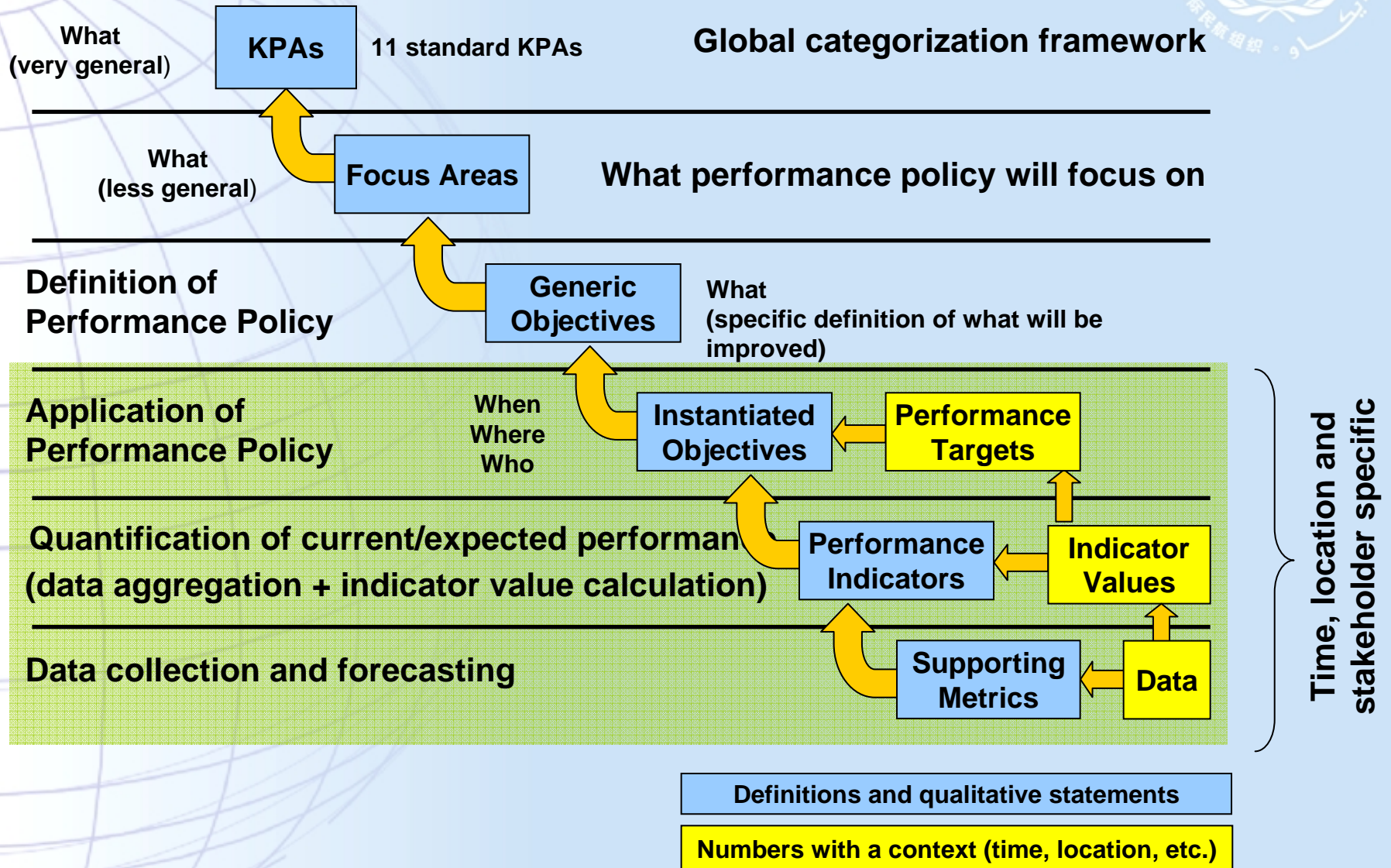


Performance Framework



- ➔ The performance based approach provides decision makers with a consistent approach to apply when implementing changes to the Air Navigation System.
- ➔ There are a number aspects to a performance-based system for which consistency confers advantages. This presentation provides an overview covering several constructs of these aspects:
 - ✓ A performance hierarchy that helps to describe how performance changes at one level can influence high-level objectives.
 - ✓ A measurement taxonomy that describes how metrics are defined within each key performance area.
 - ✓ A structured view of the Air Navigation System required for explicit and consistent definitions of metrics.
 - ✓ A description of the performance process maturity level.
- ➔ Together, these constructs are called a *Performance Framework*.
 - ✓ In essence, 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.

Measurement Taxonomy

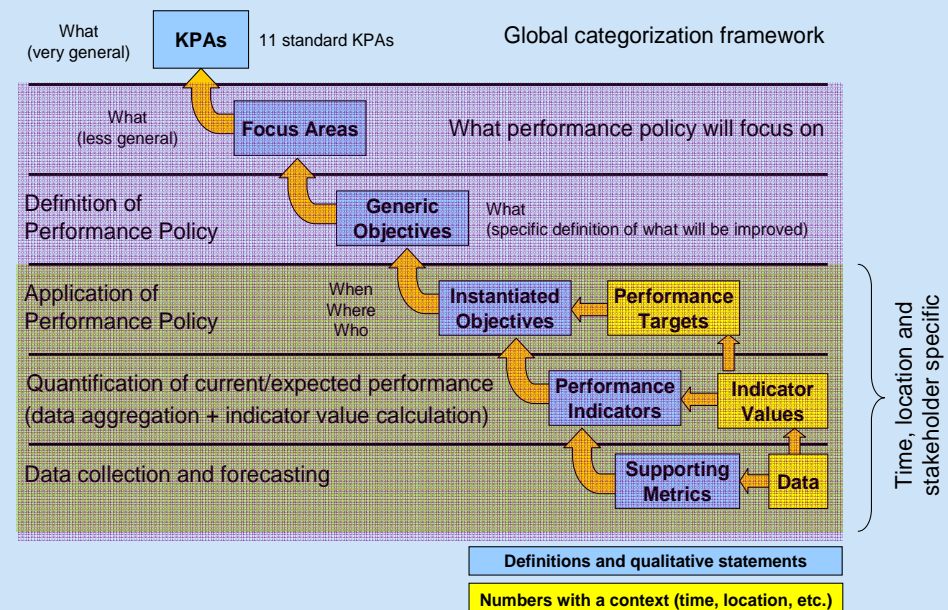


Global Categorization Framework



- ➔ Focus areas are defined within each KPA to identify and delineate the broad areas in which there are intentions to establish a performance policy via the definition of generic objectives.
- ➔ Focus areas may be defined as a result of an understanding or high-level analysis indicating areas where performance must be addressed in any given KPA.
 - ✓ For example, in the safety KPA, focus may be in such areas as CFIT accidents, runway incursions, or mid-air collisions for general aviation aircraft.

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Eleven Key Performance Areas are defined, one per ICAO OCD expectation.

KPAs are named after their corresponding expectation.

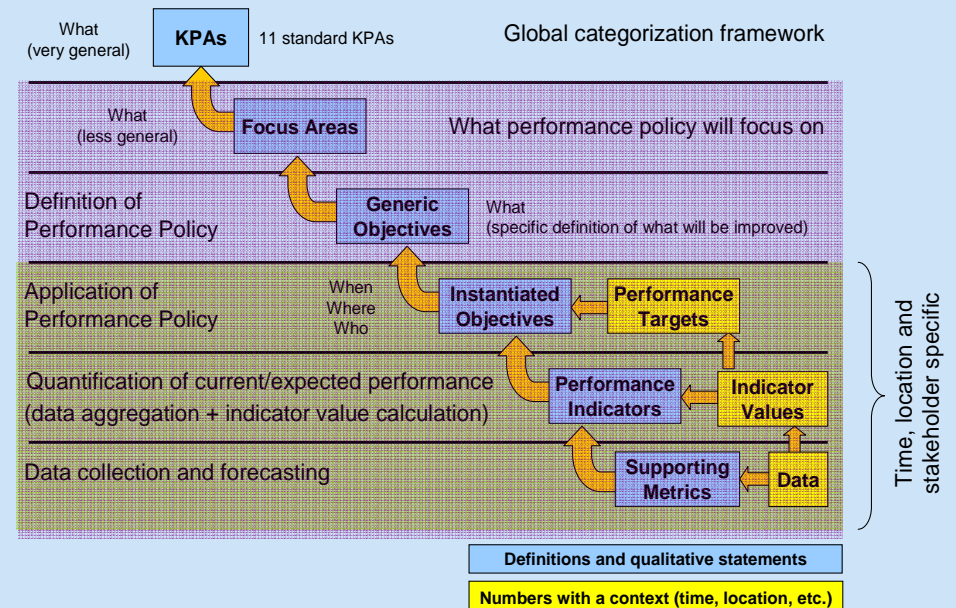
KPAs are defined/updated in the Performance Based Approach during:

Step 1.3: Identify Ambitions & Expectations

Global Categorization Framework



- Access and Equity
- Capacity
- Cost-effectiveness
- Efficiency
- Environment
- Flexibility
- Global Interoperability
- Participation by the ATM Community
- Predictability
- Safety
- Security



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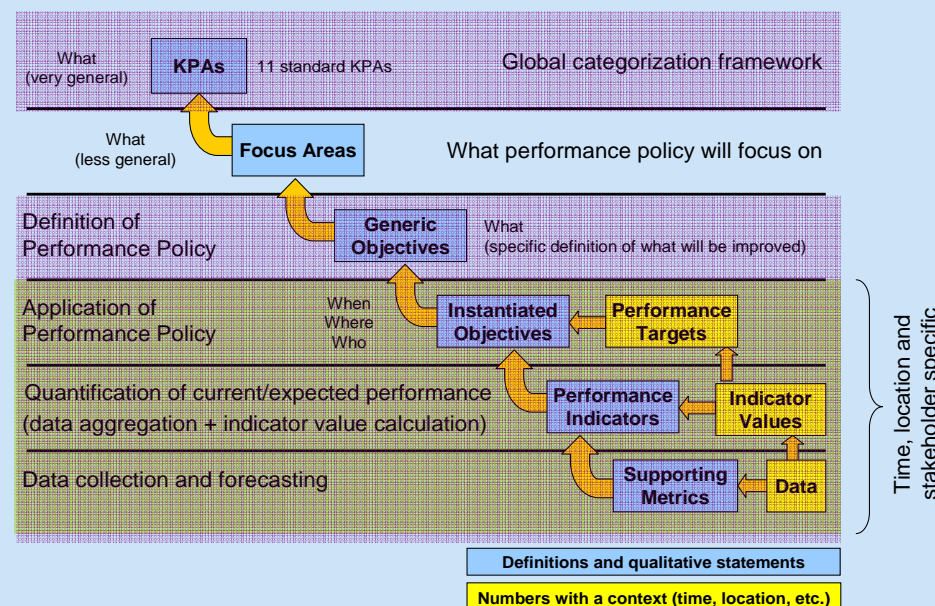
Step 1.3: Identify Ambitions & Expectations

What Performance Policy Will Focus On



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Focus Areas are defined and/or updated in the performance-based approach during:

Step 2.2: Focus Efforts by Defining and Prioritising Performance Objectives as Needed

Definition of Performance Policy



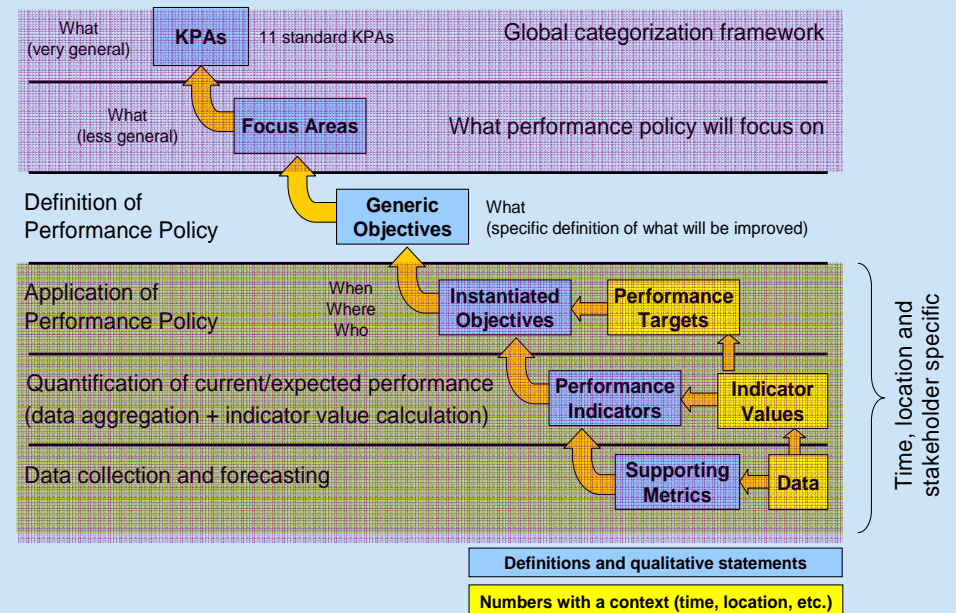
→ Each expectation should be reached through meeting a set of specific, measurable, achievable, relevant and timely (SMART) objectives.

→ Generic Objectives are an expression of Performance Policy by defining — in a qualitative but focused way — a desired trend from today's performance (e.g. improvement).

→ They specifically focus on what has to be achieved, but do not make statements about the when, where, or who.

→ Because at this level no mention is made about the when, where and who, it does not make sense to try to associate numbers (indicator values or targets) at this point.

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Generic Objectives are defined and/or updated in the performance-based approach during:

Step 2.2: Focus Efforts by Defining and Prioritizing Performance Objectives as Needed

Application of Performance Policy



→ Once generic objectives have been described, these must be precisely defined and numerical targets must be set. These precisely defined objectives are labeled “instantiated objectives”.

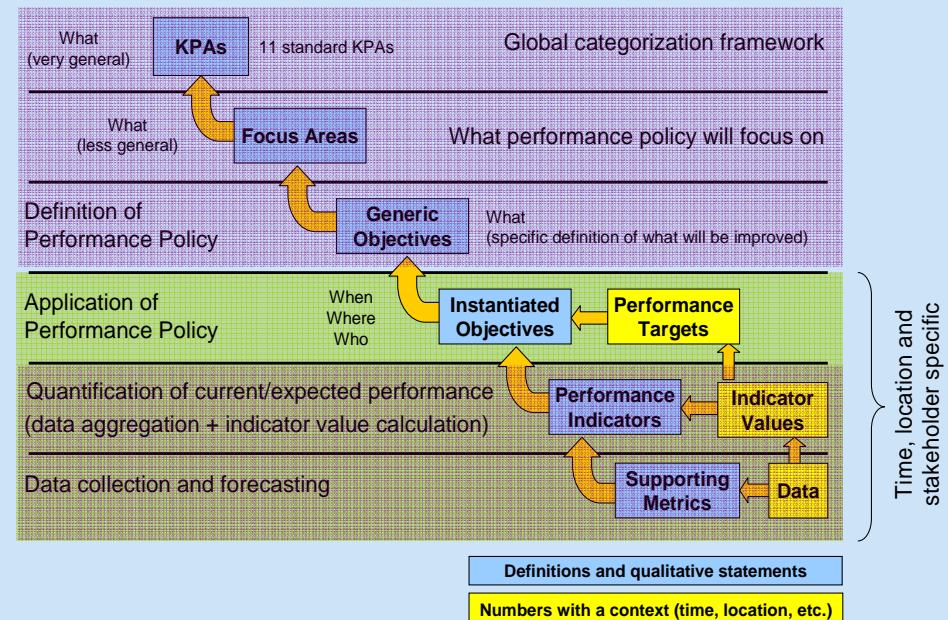
→ The instantiated objectives deal with the when, where and who.

→ Starting with the generic objectives previously defined, the instantiated objectives limit the scope by describing the applicable ATM planning environment.

→ Once instantiated objectives are defined, one requires a means of knowing when the objective has been met.

→ This is accomplished through the establishment of a set of targets on numerical performance indicators.

→ Performance targets can only be specified after indicators have been defined.



Instantiated objectives and performance targets are defined and/or updated in the performance-based approach during:

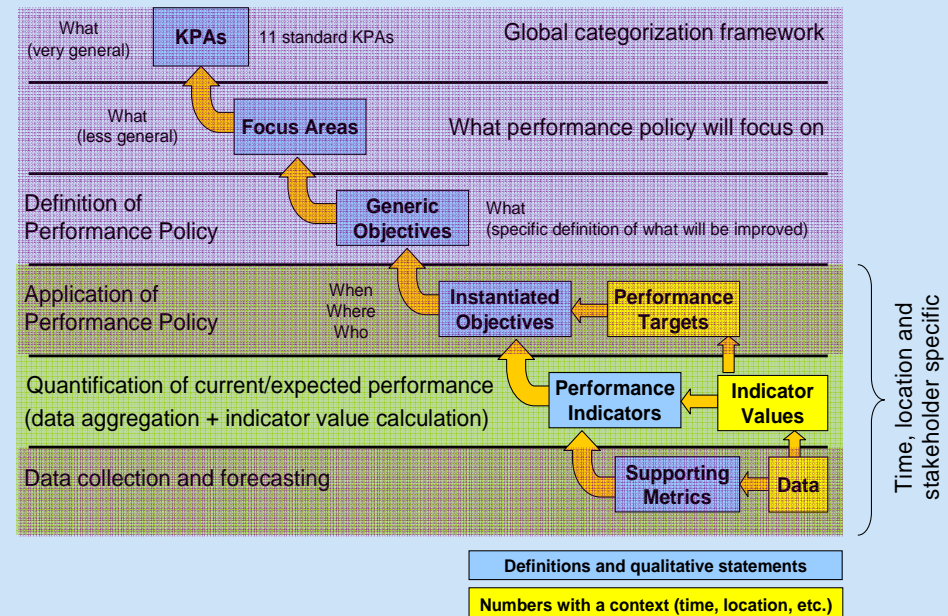
Step 2.2: Focus Efforts by Defining and Prioritising Performance Objectives as Needed

Step 3.2: Define the Desired Speed of Progress in Terms of Baseline and Target Performance

Quantification of Performance



- Instantiated objectives require precisely defined numerical performance indicators.
- These serve to establish quantitative measures that collectively will indicate progress towards achieving an objective.
- Performance indicators should very precisely describe how the indicators should be derived using supporting metrics. This includes considerations such as limits on scope, statistical derivation, or other mathematical derivation.



Performance indicators are defined in the performance-based approach during:

Step 3.1: Define how Progress in Achieving Performance Objectives will be measured and which Data are required to do so

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

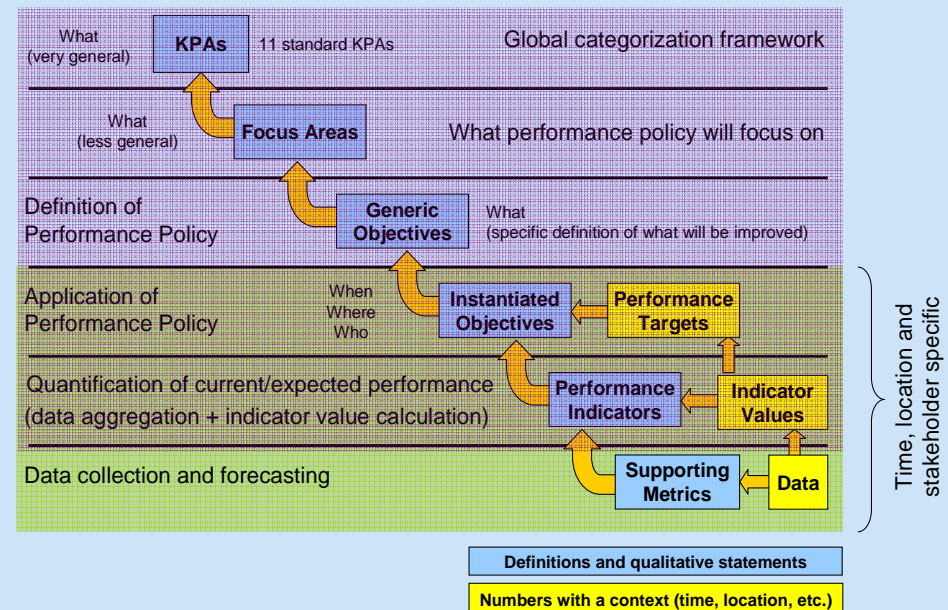
Step 4.3: Select a Sufficient Set of Solutions

Step 6: Assess Achievement of Objectives

Data Collection and Forecasting



- Supporting metrics are required to compute the performance indicators.
- The supporting metrics define which data needs to be collected and/or forecasted to calculate values for the performance indicators.
- Definitions must be sufficiently precise to allow individuals to duplicate the exact measurement without “insider knowledge”.
- Associated with each definition is the actual data itself which is used to create the indicator values.



Supporting metrics are defined in the performance-based approach during:

Step 3.1: Define how Progress in Achieving Performance Objectives will be measured and which Data are required to do so

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 6: Assess Achievement of Objectives

ATM Community Expectations

- Access and Equity
- Capacity
- Cost-effectiveness
- Efficiency
- Environment
- Flexibility
- Global Interoperability
- Participation by the ATM Community
- Predictability
- Safety
- Security

**ATM Community
Expectations**



**Key Performance
Areas**



Objectives



Indicators

Global ATM Requirements

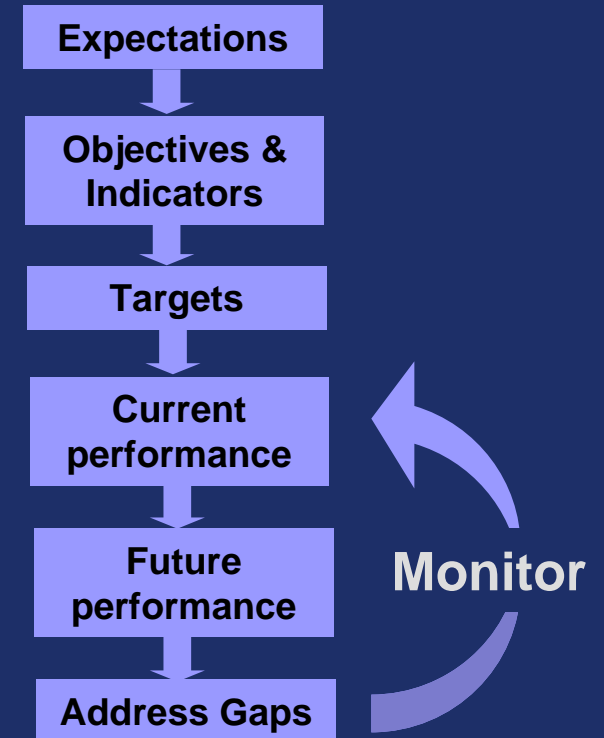
- ➔ Performance-based ATM is central
- ➔ What does this mean?
 - ✓ Justify changes (operational improvements) to the ATM system with their performance impact
 - ✓ Post-implementation monitoring
 - ✓ Balance the multiple aspects of performance
 - ✓ Guided by community expectations

*The Global ATM Operational Concept envisions a system that is service oriented, performance driven and predicated on the guiding principles described in the OCD (Global Air Traffic Management Operational Concept, Doc 9854). To fulfill this vision, the ATM system **shall**:*

- a. **Ensure** that performance forms the basis for all ATM system development;*
- b. **Treat** performance as a whole, that is, considering all the ATM community expectations and their relationships;*

Overview of Performance Process

- ➔ Expectations lead to targets
- ➔ Current performance is measured
- ➔ Future performance is estimated from forecasts
- ➔ Performance gaps are addressed via additional operational improvements
- ➔ Performance is monitored
- ➔ Plan is adjusted



Level of Consistency

- Variations in expectations & actual performance
 - ✓ Across time
 - ✓ Location
 - ✓ ATM community member
- System is tailored to best meet needs of individual locations at specific times
- Harmonized on:
 - ✓ Consistent definitions
 - ✓ Measurement, data, and estimation
 - ✓ Consistent performance approach

It is critical that the metrics be applied uniformly across the total system, i.e. that in a series of linked systems (regions, homogenous areas, etc.) they will be the same, while the actual required level of performance may be variable.

(From Doc. 9854)

Need for Consistent Framework

- End-to-end performance
- Benchmarking
- Best Practices
- Accountability
- Consistent requirements
- Service Delivery

Global Interoperability Goal





Thank You