International Civil Aviation Organization

The Sixth Meeting of the APANPIRG ATM Sub-Group (ATM/SG/6)

Hong Kong, China, 30 July – 03 August 2018

Agenda Item 3: Performance Frameworks and Metrics

REAPING THE BENEFITS OF PERFORMANCE MEASUREMENT

(Presented by EUROCONTROL, Japan, Singapore and the United States)

SUMMARY

This paper presents the progress of the Performance Benchmarking Work Group (PBWG) involving EUROCONTROL, Japan, Singapore and the United States that formed as a collaboration among the members. It describes the benefits reaped by each member in the implementation of performance measurement and through its participation in performance benchmarking.

The meeting is invited to take note of the action in paragraph 3.

1. INTRODUCTION

1.1 The 5th edition of the 2016-2030 ICAO Global Air Navigation Plan was published in November 2016 and introduced 16 potential KPIs. Of the 16, there were seven core and nine additional KPIs. The core KPIs allow States to assess the efficiency of their system while keeping data processing and data archiving requirements to a minimum, while the additional KPIs require flight trajectory information to produce and will require more extensive data processing.

1.2 The responsibility of selecting the KPIs lies with the Planning and Implementation Regional Groups (PIRGs). The PIRGs can select suitable KPIs based on the maturity of the data in the region and the implicit and explicit costs of producing the said KPIs. The PIRGs has until 2019 to select the KPIs.

2. DISCUSSION

Benefits of performance measurement

2.1 In July 2015, EUROCONTROL, the Civil Aviation Authority of Singapore (CAAS) and the United States Federal Aviation Administration (FAA) commenced performance benchmarking on two KPIs, namely KPI02 taxi-out additional time and KPI08 additional time in terminal airspace. This joint work effort is performed as a collaboration among the members.

2.2 The first year was spent on researching and testing suitable methodology for each of the KPIs. As the work progresses, the methodology was refined and more conditions were developed to ensure statistical robustness. The first phase of the tripartite benchmarking was concluded in September 2017.

2.3 Initially, the work group attempted to implement KPI08 using already established methodologies and best practices. The work group measured the KPI using both the 40NM and 100NM whilst using the airport wide 20th percentile as the unimpeded time. It was then noted that 100NM made for better comparison as it included the holding stacks for most airports.

2.4 The 20th percentile at the airport level also resulted in very high standard error and the concept of grouping by engine type / wake turbulence category, arrival runway and entry points was introduced. After grouping, it was also noted that the groups should not be too small to account for statistical robustness. The groups should also not be too big such that each group only contains flights with largely similar characteristics.

2.5 After grouping the flights by its flight characteristics, the work group tested means of determining the unimpeded time of each group. With the concept that unimpeded time should rightfully measure a flight with a smooth flight path without any delay due to air traffic control (e.g. speed control, vectoring, holding), it was decided that the unimpeded value should be low, stable and only achievable by flights during phases of non- or low-congestion at the airport (e.g. non-peak hours).

2.6 After measurement, many different analyses could then be done by the individual ANSP. This includes causal factors for the longer additional times in some gate-runway pairings; correlating additional times to traffic movements; and additional times filtered by hour of the day. Apart from performing intrinsic analysis, there are other extrinsic analytics such as causal factor analysis and the correlation of KPIs to uncover insights. The information can then be extrapolated to forecast the forward trend. Measurement and analytics have proven beneficial to all members of the work group.

2.7 The work of the work group was presented at various ICAO Asia Pacific fora, including the meetings of the Air Traffic Management Sub-Group (ATM/SG) and the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG). It has attracted the interest of States and Japan Air Navigation Services (JANS) joined the work group in September 2017.

2.8 The work group, officially termed Performance Benchmarking Working Group (PBWG), continues as a collaboration between the four organisations and is not an ICAO work group nor is it affiliated to any other organisations. At present, the PBWG is identifying additional operational KPIs for benchmarking and as a result, the methodologies for the KPIs are being refined. The PBWG aims to continue its work to include all the KPIs in the GANP. Without an existing KPI framework document, the PBWG is putting in place a system of developing, testing and implementing each KPI and has accumulated rich experience in this.

2.9 APANPIRG has tasked the ATM/SG to draft a Regional Performance Measurement Framework that supports Asia/Pacific Seamless ATM implementation. ATM/SG4 then formed the Regional ATM Performance Measurement Framework Small Working Group (RAPMF/SWG) to research the barriers about the performance metric, and propose the KPI framework to support the implementation of the seamless ATM plan in APAC region.

2.10 It is recommended that rather than to start from scratch, the RAPMF/SWG can leverage the work of the PBWG to progress the region in the selection on KPIs for the Regional Performance Measurement Framework. The PBWG is well-poised to provide guidance as it has a good representation of the Asia Pacific region and have accumulated rich experience in the area of performance measurement to estimate the cost of producing the KPIs.

Other potential uses of performance measurement

2.11 While the region reviews the Asia Pacific Seamless ATM Plan, it is important for the region to consider the use of performance measurement in this regard. Plans have to be built on opportunities and performance gaps and a robust and iterative performance measurement process for identification of performance gaps and refinement of plans is imperative. The relevant KPIs can be taken from the GANP to be used as measure of effectiveness and measures of performance in assessing the cost-benefit of each planned initiative. The GANP recommends States start with a simple set of indicators.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the benefits of performance measurement;

b) encourage States to adopt performance management using the ICAO GANP KPIs to guide selection of KPIs; and

c) urge the ATM SG to select a common set of the ICAO GANP KPIs for performance measurement within the Asia Pacific region.

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