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DIRECTORS GENERAL OF CIVIL AVIATION  
ASIA AND PACIFIC REGIONS**

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AGENDA ITEM 1:        THEME TOPIC

**A COLLABORATIVE APPROACH TOWARDS  
PERFORMANCE BENCHMARKING**

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

**SUMMARY**

Although a performance-based approach in ATM is paramount to levelling up the capability of Air Navigation Service Providers (ANSPs), the implementation of performance metrics remains challenging.

To address these challenges, the Civil Aviation Authority of Singapore (CAAS), the European Organization for the Safety of Air Navigation (EUROCONTROL), the United States Federal Aviation Administration (FAA) and the Japan Air Navigation Service (JANS) came together and collaborated to develop harmonised methodologies for Key Performance Indicators (KPIs) captured in the ICAO Global Air Navigation Plan (GANP).

The primary goals of this effort is to provide recommendations for ICAO regional and global guidance on performance KPIs and to share operational experience in using KPIs within the respective ANSPs.

## **A COLLABORATIVE APPROACH TOWARDS PERFORMANCE BENCHMARKING**

### **1. INTRODUCTION**

1.1 ICAO Document 9883, the Manual on Global Performance of the Air Navigation System, provides guidance on the Performance Based Approach (PBA) and the role of metrics in decision-making. Appendix E in particular provides examples of metrics for 11 different Key Performance Areas (KPA). The document acknowledges that more work is needed in this area and that work is required on the part of Administrations to develop capabilities for measuring performance as well as to promote the harmonised application of the performance framework across the industry. In November 2016, ICAO released its 5th edition of the 2016-2030 Global Air Navigation Plan (GANP) where 16 Key Performance Indicators (KPI) were recommended for 3 of the 11 KPAs, viz. Efficiency, Capacity and Predictability.

1.2 In order for Air Navigation Service Providers (ANSPs) to maintain high levels of safety and efficiency, performance measurement is necessary to assess the performance of their air navigation systems and to identify areas of improvement. However, the implementation of performance metrics remains challenging due to reasons such as a lack of well-defined methodologies and gaps in data collection. It was against such a backdrop that the Civil Aviation Authority of Singapore (CAAS), the European Organization for the Safety of Air Navigation (EUROCONTROL), the United States Federal Aviation Administration (FAA) and the Japan Air Navigation Service (JANS) came together and collaborated to develop common methodologies for KPIs captured in the ICAO GANP. Common procedures not only allow ANSPs to reduce cost in data collation and KPI measurement, but also makes it easier for the process to be adopted by States/Administrations that have not commenced the performance measurement journey. In addition, a harmonised approach in establishing performance metrics enables the benchmarking of performance among ANSPs and airports and helps ANSPs assess if certain performance improvements are possible given that they are demonstrated at comparable airports.

1.3 This paper explains the benefits of a collaborative and harmonised approach in performance benchmarking for safe and sustainable flight operations and encourages States/Administrations to adopt a similar approach.

### **2. DISCUSSION**

#### **Benefits of Collaboration in Performance Benchmarking**

2.1 CAAS, EUROCONTROL, JANS and FAA have jointly identified the benefits of a performance-based approach in air traffic services (ATS) provision. Although the ICAO GANP has indicated 16 KPIs, the absence of an ICAO KPI guidance framework makes implementation and execution challenging. As such, the parties envisioned the development of common methodologies for the ICAO GANP KPIs and initiated performance benchmarking on two of the ICAO GANP KPIs, namely KPI02 taxi-out additional time and KPI08 additional time in terminal airspace. The 2 KPIs were selected as both measure the efficiency of the ANSPs' departing and arriving flights respectively.

2.2 Singapore Changi Airport was benchmarked in context with comparable US and European airports, similar to work performed in previous US/Europe benchmarking activities. The first year was spent researching and testing a suitable methodology for each of the KPIs. As the work progressed, the methodology was refined and more conditions were developed to ensure statistical robustness. It was only through collaborative trial and error as well as multiple brainstorming sessions among all stakeholders that enabled the refinement of existing practices as well as the discovery of novel methods to be made so quickly and effectively. The first phase of the tripartite benchmarking was concluded in September 2017. In September of 2017, JANS joined the work group and results for the Japan airports of Narita and Haneda were added to the joint work.

2.3 The use of a common methodology made possible the benchmarking of performance among comparable airports in other regions. While some airports performed better in KPI02 and other airports excelled in KPI08, there is an obvious trade-off between the two KPIs. Apart from benchmarking performance, the collaboration also saw exchange of operational best practices for adoption by other ANSPs. Such an unbiased and accurate assessment of an airport's performance relative to that of similar airports also aided in the surfacing of an airport's strengths and weaknesses in terms of certain operational parameters and constraints. The work identifies best practices of other airports which can be shared among other members.

2.4 A fundamental concept of performance measurement is establishing a commitment to performance enhancement through identifying performance targets. When setting performance targets for their airports, the performance of comparable airports represents an invaluable input to balance historic performance with realistic performance expectations.

2.5 Overall, through this collaboration, performance measurement and analytics have proven beneficial to all members of the work group. The work of the work group has been 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). For the Asia-Pacific region, the work seeks to inform and complement the ICAO Regional ATM Performance Measurement Framework group tasked with the update of ICAO guidance for the region.

2.6 The work group, officially termed the Performance Benchmarking Working Group (PBWG), remains as a collaboration among the four organisations and is neither an ICAO work group nor a group affiliated to any other organisations. At present, the PBWG has identified two additional ICAO GANP KPIs for benchmarking as part of its Phase 2 work. Eventually, the PBWG aims to develop harmonised methodologies for all of the ICAO GANP KPIs. In the absence of an existing KPI framework document, the PBWG is putting in place a system of developing, testing and implementing each KPI.

2.7 Citing the success of the collaboration between members of the PBWG, it is recommended that rather than to start from scratch, States/Administrations can collaborate with each other to harmonise performance measurement approaches by having common methodologies and having a common basis for comparison across airports. The PBWG is willing to share its experiences with States/Administrations to assist them in performance measurement to allow harmonisation within the Asia Pacific region.

### **3. ACTION BY THE CONFERENCE**

3.1 The Conference is invited to:

- a) note the benefits of collaboration and harmonisation in performance benchmarking;
- b) encourage States/Administrations to adopt a harmonised approach to performance measurement using the ICAO GANP KPIs to guide selection of KPIs; and
- c) note the progress of the PBWG work on performance measurement and discuss how the PBWG can assist States/Administrations to adopt performance measurement.