



**WORKING PAPER**

**ASSEMBLY — 40TH SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 28: Aviation Safety and Air Navigation Policy**

**ICAO PERFORMANCE MEASUREMENT AND STAKEHOLDERS' ENGAGEMENT**

(Presented by Singapore, and co-sponsored by Japan, Thailand, the United States, and the Civil Air Navigation Services Organisation (CANSO))

**EXECUTIVE SUMMARY**

ICAO has published the *Manual on Global Performance of the Air Navigation System* (Doc 9883), to detail the importance and benefits of adopting a performance-based approach to meet requirements, improve operations, and manage change. The draft 6th edition of the *Global Air Navigation Plan* (GANP, Doc 9750) includes 19 key performance indicators (KPIs) for States' adoption to facilitate the performance-based approach and management to improve air traffic management (ATM) operations. However, there is currently a lack of guidance to support States in the implementation and monitoring of these KPIs. The European Organisation for the Safety of Air Navigation (EUROCONTROL), Japan, Singapore, Thailand, and the United States propose for the development of such a guidance document including stakeholders' engagement and for this work to be undertaken by the existing Global ICAO Performance Expert Group (GIPEG) of which these countries and EUROCONTROL are members.

**Action:** The Assembly is invited to:

- a) request ICAO GIPEG to develop a KPI framework guidance document for air navigation services providers;
- b) request ICAO GIPEG to incorporate stakeholders' engagement in the development of the KPI framework; and
- c) encourage States, PIRGs, and the aviation industry to use the 6th edition of the GANP together with these guidance documents in the implementation of performance management.

<i>Strategic Objectives:</i>	This working paper relates to all Strategic Objectives.
<i>Financial implications:</i>	The activities referred to in this paper will be undertaken by the Global ICAO Performance Expert Group (GIPEG) subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions.
<i>References:</i>	Doc 9883, <i>Manual on Global Performance of the Air Navigation System</i> Doc 9750, <i>Global Air Navigation Plan</i> , Fifth Edition Resolution A39-12, <i>ICAO global planning for safety and air navigation</i>

## 1. INTRODUCTION

1.1 Having an ATM performance framework provides guidance to air navigation service providers (ANSPs) and other aviation stakeholders including airlines, airports and ground handlers to establish priorities, targets and indicators consistent with globally-harmonised objectives under the GANP, aligned with Assembly Resolution A39-12. ICAO introduced a performance-based approach as part of the GANP to prioritise future investments by ANSPs as part of the aviation system block upgrades (ASBUs). ICAO also published Doc 9883 to aid ANSPs in adopting a performance-based approach, detailing the importance and benefits of a performance-based approach to meet requirements. While these ICAO documents provide States with an overview to adopt performance measurement, they do not include detailed methodologies to aid implementation or identify stakeholders' involvement.

1.2 The 6th edition of the GANP to be endorsed at this Assembly contains 19 KPIs. States and regions are encouraged to start with qualitative expert analysis and develop policy statements on ATM performance measurement, followed by the implementation of more advanced quantitative approach with more mature data processing and analytics capabilities. It is envisaged that as more States and regions contribute and exchange information on their ATM performances, this could further enhance performance measurement under a global approach.

1.3 Adopting a performance-based approach to ATM will help to level up the capabilities of ANSPs. Proposals for guidance on a well-defined performance framework detailing the planning, implementation and regular monitoring processes were discussed and agreed at the 13th ICAO Air Navigation Conference (AN-Conf/13) to assist States in the ANSP data management process.

1.4 The GIPEG was formed to review and develop the performance framework for future versions of the GANP. The GIPEG comprises policy, technical, operational and performance experts from States, international organisations, industry and ATM modernisation programmes. Its terms of reference are to update the strategy within the GANP, keep up to date the technical content and promote the alignment of global, regional and national air navigation planning while considering air navigation planning matters within a broader aviation planning framework, taking reference from the review of existing performance framework conducted by the Small ICAO Performance Expert Group (SIPEG).

## 2. DISCUSSION

2.1 In July 2015, Singapore, the United States and EUROCONTROL embarked on a collaboration effort to conduct performance benchmarking on two GANP KPIs, namely KPI02 taxi-out additional time and KPI08 additional time in terminal airspace. The first phase of the tripartite collaboration involved researching and testing suitable methodologies for each of the KPIs, refining methodologies and adding more conditions to ensure statistical robustness. The first phase was concluded in September 2017 and the work presented at various ICAO Asia Pacific fora, including the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) and its ATM sub-group. Japan and Thailand were interested and joined the group subsequently, bringing richer and more diverse expertises.

2.2 As there was no reference KPI framework document, the group established a system of developing, testing and implementing each KPI. The group of five continues its efforts in joint benchmarking of ATM performance, defining methodologies and performance measurement, conducting deep-dive analytics to determine causal factors of performance, and engaging stakeholders that could

influence the metrics. It shared its experiences on the development of performance framework at the AN-Conf/13 and the SIPEG.

2.3 The group emphasised stakeholders' engagement. This was because the group recognised that multiple stakeholders are involved in driving ATM performance and a collaborative stakeholder forum would be beneficial to make improvements and enhance coordination to enhance the overall aviation performance. When measuring KPI02 taxi-out additional time, which is defined as the time taken from the aircraft's off-block to wheels-off in excess of the unimpeded time, members of the group worked with their respective airport management to optimise stand allocation and more efficient towing movements to minimise taxiway and apron congestion. They also worked with aircraft operators to adhere to allocated slots and minimise runway occupancy time to reduce the additional taxi-out time. ANSPs were also encouraged to be involved in the airport's master planning to design taxiways and their corresponding traffic movements to reduce unimpeded taxi-out time.

2.4 With the acceptance of a performance-based approach and evolution of data analytics, performance measurement is gaining traction from all stakeholders in the aviation ecosystem including aircraft operators, airports and ground handlers.

2.5 In addressing stakeholders' engagement for collaborative decision making, it would be essential to identify the core KPIs; assess the means of measurement and monitoring; and propose a collaborative approach to analysing the performance outcomes. Airlines, airports and ground handlers are all part of a highly integrated aviation process with high interconnectivity. There is a need for the performance guidance document to take on a system-of-systems approach addressing performance of each system and the connection between each pair of systems.

2.6 A guidance document would facilitate the implementation of the performance framework, especially for ANSPs, who typically have their own metrics for measuring performance standards. It will help to avoid the emergence of different measures which makes benchmarking difficult.

2.7 The group proposes that the GIPEG would be the appropriate body to develop and publish guidance documents for performance framework. The guidance material could initially include the methodologies of the 19 KPIs listed in the 6th edition of the GANP, provide guidance for stakeholders' engagement, and case studies to detail stakeholders' engagement and post-operations analysis. Over time, the guidance document could evolve to include KPIs from all the 11 KPAs stated in Doc 9883, including for safety KPIs.

### 3. CONCLUSION

3.1 Adopting a performance-based approach to ATM is an important first step to level up the capability of ANSPs. With greater focus on performance-based management, a guidance document detailing the planning, implementation and regular monitoring processes is timely and necessary to assist States in the implementation of performance measurement regardless of the maturity level of their data management processes. The guidance document should for a start include the methodologies for the 19 KPIs listed in the 6th edition of the GANP, the guidelines for stakeholders' engagement and a plan to include KPIs from all 11 KPAs stated in Doc 9883. The work could be undertaken by the existing GIPEG such that minimal ICAO resources would be required.