International Civil Aviation Organization

A37-WP/11
TE/2
3/8/10

WORKING PAPER

ASSEMBLY — 37TH SESSION

TECHNICAL COMMISSION

Agenda Item 35: The global air traffic management system

A GLOBAL AIR NAVIGATION SYSTEM – DEVELOPMENTS IN IMPLEMENTATION

(Presented by the Council of ICAO)

EXECUTIVE SUMMARY

This paper aims to raise awareness among States and international organizations on developments related to the implementation of a performance-based global air navigation system.

ICAO, guided by two Assembly resolutions (A35-15 and A36-7), continues to work towards the implementation of a global air navigation system. The development of a performance framework for its implementation is done in support of the Global Air Traffic Management (ATM) Operational Concept. The realization of the vision for future ATM requires a collaborative environment with significant information content as described in the flight and flow of information for a collaborative environment (FF-ICE) concept, under development.

This report expands upon other efforts including: the development of the *Manual on Global Performance of the Air Navigation System* (Doc 9883); and the implementation of a performance framework to serve as a mechanism for management and governing bodies to implement, monitor and review the detailed activities and time lines, which should lead to the realization of the global air navigation system as envisaged in the operational concept.

Action: The Assembly is invited to note the developments related to the implementation of a performance-based global air navigation system.

Strategic Objectives:	This working paper relates to Strategic Objectives A and D.
Financial implications:	Resources for the activities referred to in this paper are included in the proposed budget for 2011 to 2013.
References:	Doc 9750, *Global Air Navigation Plan* Doc 9854, *Global Air Traffic Management Operational Concept* Doc 9882, *Manual on Air Traffic Management System Requirements* Doc 9883, *Manual on Global Performance of the Air Navigation System* Doc 9902, *Assembly Resolutions in Force* (as of 28 September 2007)

(4 pages)

1. INTRODUCTION

1.1 Since the adoption of Resolution A36-7 (*ICAO Global Planning for Safety and Efficiency)* by the ICAO Assembly, several developments have taken place related to the implementation of a global air navigation system. The *Global Air Navigation Plan* (GANP, Doc 9750) was updated, principles and practices to help States and international organizations develop an approach to performance management suited to their local conditions, including transition strategies, were developed in support of the *Global Air Traffic Management Operational Concept* (Doc 9854). The establishment of a global performance framework was adopted by the planning and implementation regional groups (PIRGs).

2. ICAO EFFORTS TOWARD IMPLEMENTATION OF A GLOBAL AIR NAVIGATION SYSTEM

2.1 Manual on global performance of the air navigation system

2.1.1 There is a need to change the way in which the evolution of ATM is planned at national, regional and global levels and to support GANP as a transition planning document. States and regions need to work collaboratively in developing transition arrangements towards the global system envisioned in the operational concept. Increasingly, planning choices are justified in advance through the analysis of anticipated performance needs, expected benefits and achievement timelines. The *Manual on Global Performance of the Air Navigation System* (Doc 9883) has been developed with a view to raising awareness of the need for globally-harmonized planning and provides practical guidance on the integration of performance-based planning thus promoting a globally harmonized and agreed approach while meeting the needs of the aviation community.

2.1.2 The document should not be considered in isolation, but in the context of the operational concept which provides the overall vision and direction; th*e Manual on Air Traffic Management System Requirements* (Doc 9882) which elaborates the overall vision into material specifying the functional evolution of ATM, and GANP which will serve as the basis for harmonized and coordinated implementation planning.

2.2 Development of a global performance framework to support implementation

2.2.1 On 20 November 2006, the Council approved a set of twenty-three Global Plan Initiatives (GPIs) as part of GANP. PIRGs initiated the adoption of a performance framework, performance objectives, implementation timelines and the development of a comprehensive schedule and programme of planning activities to achieve their work, aligned with GANP.

2.2.2 A series of workshops for ICAO regions were held to provide detailed guidance to States on the development of national performance frameworks for air navigation systems. Workshops covering the Asia/Pacific, Middle East, South American and Caribbean Regions were held in 2009. Similar workshops will be conducted in the remaining regions during 2010-2011.

2.2.3 The next step entails performance monitoring and measurement of air navigation systems. As there is a need for identification of suitable harmonized metrics for the regions; States will be requested to provide relevant data.

2.3 Flight and flow information for a collaborative environment (FF-ICE)

2.3.1 The FF-ICE concept is being developed to achieve the vision outlined in the operational concept and ATM requirements. Information for a collaborative environment (ICE) is composed of multiple domains including flight and flow information (FF). The intent is for FF-ICE to define the information requirements for flow management, flight planning, and trajectory management associated with the operational concept components. Implementation of the FF-ICE concept is envisaged during the timeframe through 2025.

2.3.2 It is foreseen that with the FF-ICE, the operational environment will be performance-based and will seek to meet the eleven ATM Community expectations defined in the operational concept through its seven components (demand/capacity balancing, conflict management, service delivery management, airspace organization and management, aerodrome operations, traffic synchronization and airspace user operations). FF-ICE encompasses the flight information sharing between ATM community members and starts with the early submission of flight information by the airspace users to the ATM system and ends with the archiving of relevant information after the flight. It focuses on global needs for sharing flight information but also accommodates regional and local needs.

2.3.3 The new ICAO flight plan will be implemented in November 2012; however the operational concept has greater data requirements than can be supported by the existing flight plan system. These include sharing information system-wide, providing early intent data, management by trajectory, collaborative decision making, and high automation support requiring machine readability and unambiguous information. The FF-ICE refines the operational concept in the area of flight information management. It constitutes the necessary basis for the most advanced ATM systems and the development of 4D trajectory management.

2.3.4 While it is recognized that the transition to the FF-ICE will involve significant operational and financial considerations, there would also be consequences associated with inaction or delay. With significant growth projected in air transportation, it is necessary to transition to the benefits of the operational concept as soon as possible.

2.3.5 Performance management is a continuous process with strategic, tactical, and forensic activities occurring over several years. The FF-ICE provides information and mechanisms to support these activities.

3. CONCLUSIONS

3.1 The notion of a performance-based air navigation system emanated from good industry practices that have evolved over many years. As the aviation industry has evolved into a less regulated and more corporatized environment with greater accountabilities, the advantages of implementing a performance-based air navigation system are becoming increasingly apparent. Putting in place a performance framework requires knowledge sharing, training and some specific expertise. There would also be hardware and software requirements and analysis capabilities. Considering the overall objective of establishing targets and measuring achievement, the effort will result in a more efficient system through identified cost savings, reduction in waste of resources, more equitable charging practices, and more efficient provision of services. As the work effort is challenging, requiring a globally coordinated effort, the aviation community should be encouraged to follow a common approach toward developing and implementing a performance-based global air navigation system.

3.2 In terms of major programmes that might focus on specific regions or operational requirements, the ICAO effort will continue to be aimed at ensuring interoperability, harmonization and uniformity between such initiatives and the remainder of the international civil aviation community. Such an effort should lead to greater interoperability, common procedures and agreed equipage requirements, thereby reducing costs and increasing efficiency of the air navigation system with associated benefits in terms of safety, environment and other important key performance areas as outlined in the operational concept.

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