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WORKING PAPER

ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 30: Aviation Safety and Air Navigation Policy
30.2 Latest developments related to the Global Air Navigation Plan (GANP)

EVOLUTION OF THE ICAO GLOBAL AIR NAVIGATION PLAN (GANP) AND NEW STANDARDIZATION INITIATIVES FOR EFFICIENT AND CONTINUOUS MODERNIZATION IN AN INFO-CENTRIC AND TOTAL PERFORMANCE SYSTEM

(Presented by the United States)

EXECUTIVE SUMMARY

The increase of new innovative concepts and operations have challenged both ICAO and States to provide safe and standardized integration into the global aviation system. ICAO has made significant efforts to establish both a stable foundation of traditional operations while creating future concepts for the integration of non-traditional operations through the Global Air Navigation Plan (GANP) and Aviation System Block Upgrades (ASBUs). ICAO has also looked to industry standards-making organizations to participate in the Standards Roundtable to help make the Standards and Recommended Practices (SARPs) development process more efficient.

This paper recognizes the efforts and challenges for ICAO and States to safely and efficiently advance the global aviation system while maintaining the flexibility to integrate innovative concepts and new operations. This paper also supports ICAO's continued efforts through the updated GANP and ASBUs as well as attempting to make the SARPs process more efficient. Finally this paper introduces the United States Info-Centric NAS initiative

Action: The Assembly is invited to:

a) endorse the seventh Global Air Navigation Plan;
b) further support the work of the ICAO Standards Roundtable and welcome the participation of unconventional (non-aviation) industries to provide guidance while planning for the evolution of the 8th Global Air Navigation Plan;
c) endorse the new ICAO Standardization Initiatives ensuring transparency and access to the validation history of the direct submission process; and
d) note the United States Info-Centric NAS initiative as a materialization of the GANP Conceptual Roadmap.

Strategic Objectives:	This working paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
Financial implications:	None.
References:	Doc 10140, *Assembly Resolutions in Force (as of 4 October 2019)* Doc 9750, *Global Air Navigation Plan*

1. INTRODUCTION

1.1 The increase of new innovative concepts and operations have challenged both ICAO and States to standardize integration into the global aviation system while maintaining the highest levels of safety. ICAO is frequently criticized for inefficiencies and delays in producing Standards and Recommended Practices (SARPs) as well as technical guidance material to help States prepare for and operate an integrated and harmonized airspace and keep pace with industry innovation. This criticism is also inclusive of the challenge of updating and maintaining over 12 000 SARPs.

1.2 Over the past decade, ICAO has made significant progress in creating efficiencies and creative solutions in the SARPs development process as well as helping States implement ICAO provisions. Some of this progress is credited to the evolution of the Global Air Navigation Plan (GANP) and associated aviation system block upgrades (ASBUs) as well as an openness and better transparency of the SARPs development process.

2. DISCUSSION

2.1 ICAO is in a difficult position to connect a global aviation system where participants have varying levels of development and resources. ICAO works to provide assistance for essential services while maintaining agility to allow innovation and technical advancement. The hierarchy of the GANP, Global Aviation Safety Plan (GASP), ASBUs and basic building blocks (BBBs) are vital to the health of the global aviation system.

2.2 Seventh edition of the GANP

2.2.1 The seventh edition of the GANP, while considered a minor update, solidifies linkages with the ASBUs and BBBs as well as the Global Aviation Safety Plan (GASP). The GANP reflects the interconnectivity and symbiosis of safety and air traffic.

2.2.2 In past ICAO plans, safety and air traffic while related were never directly reflected in the GANP and GASP together. The seventh edition of the GANP begins to correct this by including a safety performance framework that bridges both documents.

2.2.3 The seventh edition of the GANP also helps to build an agile foundation as the global community moves into an information-centric and total performance system as outlined in the Conceptual Roadmap, which will be further defined in the 8th edition of the GANP.

2.3 Standards Development Efficiency

2.3.1 SARPs are the core product for ICAO and are the basis of safe and harmonized international aviation operations consistent with the GANP and the GASP. Historically, the ICAO SARPs development process was in-depth and lengthy which at times limited the growth of innovation in the global aviation industry. States frequently express frustration with the time it takes to create and amend SARPs.

2.3.2 To help create efficiencies in the SARPs process, ICAO is introducing Standardization Initiatives to simplify SARP language and to invite members of global aviation standards making organizations (SMOs) to participate on the ICAO Standards Roundtable. SMOs are asked to provide best

practices and mature standards, which may be directly accepted by ICAO under the Direct Submission process.

2.3.3 The United States appreciates ICAO's intent in developing the Direct Submission Process, but encourages a modified due process that can quickly measure the quality, maturity and impact of the standards on the ICAO Work Programme.

2.3.4 The United States also encourages the participation of non-traditional members on the Standards Roundtable. As the global aviation system evolves to an information-centric ecosystem, partners from other industries may be beneficial. Cloud-based technologies and telecom networks are only a few of the non-traditional industry partners that may have a role in the future of aviation.

2.3.5 In regards to the transition from traditional operations to a digitized and total performance system that's envisioned in the GANP Conceptual Roadmap, the United States published its Operations in an Info-Centric National Airspace System (ICN) vision document. The ICN explains how the United States will leverage the information and connectivity revolution and integrate technologies, like autonomous vehicles, electric aircraft, supersonic jets, and spacecraft.

2.4 GANP Conceptual Roadmap and the Info-Centric NAS

2.4.1 As stated above, the seventh edition of the GANP bridges the gap to the information-centric and total performance system as outlined in the Conceptual Roadmap.

2.4.2 The United States published its ICN Vision Document and Concept of Operations that builds upon the previous NextGen program and outlines how it will manage new airborne vehicles that have non-traditional missions as outlined in the Conceptual Roadmap. The ICN also shows how the United States will scale to meet the expected growth in these operations with new traffic management services tailored to new entrant characteristics while coexisting with traditional air traffic services.

2.4.3 The vision focuses on the enhancement to the current system by leveraging innovation in the area of information, communication infrastructure and application layer

2.4.4 In the future the United States will operate the National Airspace System on trajectory-based operations (TBO) and interoperate with xTM services where flight rules will account for diversity of operations, environmental considerations and vehicle attributes.

2.4.5 Public-private partnerships will make contracting possible for managed services in enterprise capabilities, such as communications, aeronautical information, and weather services.

2.4.6 Public and private infrastructure will deliver traffic management services that are ubiquitous, resilient to unanticipated changes, and agile to respond to future user needs. Machine learning and artificial intelligence techniques make the workforce more adaptable and flexible in off nominal conditions such as temporary facility shutdowns.

2.4.7 The United States National Airspace System will continue to rely on a layered approach to safety controls with a greater reliance on data and emphasis on risks introduced by the integration of distributed and diverse systems. Safety-critical performance indicators will be monitored to support airworthiness, detect operational emergencies, and evaluate information assurance.

2.4.8 The United States invites ICAO and States to take note of the ICN Vision and visit the ICN website located in the footnote of this document.

3. CONCLUSION

3.1 While the development of traditional aviation systems continue around the globe, new and innovative concepts and operations are growing exponentially. States and ICAO are challenged to maintain the safe and efficient growth of traditional operations while having to plan and integrate new entrants and operations.

3.2 ICAO can utilize its global strategic plans to outline the current and future state of aviation in order to ensure harmonized growth and interconnectivity among regions and States. At its core, the global strategic plans are built upon SARPs. ICAO is applauded for the work already done and encouraged to continue to find ways to create a safe and efficient SARPs development process including traditional and non-traditional industry partners.

3.3 The United States encourages States to support the seventh edition of the GANP and its initiatives to make the SARPs development process more efficient and invites States to review the Operations in an Info-Centric NAS vision document.

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