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TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

REPORT OF THE COMMITTEE TO THE CONFERENCE ON AGENDA ITEM 2

The attached report has been approved by the Committee for submission to the Plenary.

Captain John F. McCormick
Committee Chairman

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Agenda Item 2: Aerodrome operations – improving airport performance**2.1 INTRODUCTION**

2.1.1 Under this agenda item, the modules that support the key performance area of aerodrome operations were presented. The Committee noted that increased runway infrastructure and advances in air navigation and aircraft systems were fundamental to increasing airport capacity, but are to little avail if overall airport surface operations were not optimized to improve airport performance. Modules that support airport performance improvements were addressed.

2.1.2 These are Optimized Airport Accessibility, Increased Runway throughput through Dynamic Wake Turbulence Separation, Enhanced Safety and Efficiency of Surface Operations, Optimized Airport Operations through Airport Collaborative Decision-Making, Remote Operated Aerodrome Control Tower and Improved Airport Operations through Departure, Surface and Arrival Management.

2.1.3 Consideration was given to complementary operational procedures that maximize the usage of performance-based navigation (PBN) and are essential to increasing capacity and enhancing safety through approaches with vertical guidance and stabilization of approaches to help mitigate runway excursions; and collaborative decision-making arrangements that support the sharing of information between operational partners at an airport in order to improve situational awareness and realize substantial efficiencies in the management of surface traffic. Finally, security issues were addressed which included the relationship between airport security and predictability and punctuality of flights, and cyber-security.

2.1.4 The Committee supported the module on remote towers in the aviation system block upgrades (ASBUs) but requested that this be extended to cover the full spectrum of remote air traffic services (ATS).

2.1.5 The ASBU modules that support the key performance area of aerodrome operations were introduced. These comprise the following:

- a) B0-15, B1-15, B2-15 and B3-15 – integration of arrival/departure/surface management;
- b) B0-65 and B1-65 – increasing use of GNSS-based instrument procedures;
- c) B0-70, B1-70 and B2-70 – optimized management of wake turbulence separation;
- d) B0-75, B1-75 and B2-75 – enhanced surface surveillance;
- e) B0-80 and B1-80 – airport collaborative decision-making; and
- f) B1-81 – remotely operated control towers.

2.2 AIRPORT CAPACITY

2.2.1 The Committee agreed that airports, along with aircraft and air traffic management, represent one of the three major components in an integrated approach to improving the performance of air transportation. As en-route capacity is increased, airports being the nodes of the air traffic network

could be potential choke points if nothing is done to address this constraining factor. Increased runway infrastructure and advances in air navigation and aircraft systems are fundamental to increasing airport capacity however; overall airport surface operations must also be optimized to improve airport performance.

2.2.2 In relation to surface movement guidance facilities, the Committee called upon ICAO to study performance requirements for the purpose of expediting safe and efficient ground movement of aircraft, vehicles and personnel in visibility condition 4 (equivalent to a runway visual range of 75 m or less) and reflect this in the most appropriate document.

2.2.3 Acknowledging the importance of airport collaborative decision making (A-CDM) as an enabler for airport partners to work together more efficiently and transparently, the Committee recognized that through the use of A-CDM, information sharing among stakeholders will be improved and the use of local capacity, optimized. It enables decision-making under rapidly changing operational conditions and improves predictability, capacity, performance resilience and efficiency.

2.2.4 The Committee also agreed to support the implementation of ACI's Airport Excellence in Safety (APEX) programme with the goal of improving safety by decreasing the number of runway incursions and excursions, reducing the number of fatal accidents, and decreasing the number of safety incidents. To this end, the Committee recommends that ICAO continues its participation in the safety reviews and sharing of relevant safety information.

2.3 SECURITY

2.3.1 On the subject of security of air navigation systems, the Committee was presented with an oral report covering the outcome of the High-level Conference on Aviation Security (HLCAS) that was held in Montréal from 12 to 14 September 2012. The Committee agreed that cyber security could be an impediment to the implementation of the Global Air Navigation Plan. The term "cyber security" encompasses the protection of electronic systems from malicious electronic attack and the means of dealing with the consequences of such attacks. Although, numerous industry groups are making standards in their own areas of expertise, it was noted that there was no overall oversight thus resulting in potential for gaps, overlaps and inconsistencies and no global framework that addresses cyber security issues with a clear view of air traffic management (ATM) efficiency and based as far as possible on existing ICAO structures and bodies but with proper involvement of the necessary cyber security expertise. Consequently, the Committee called upon ICAO, while continuing its work on air traffic management (ATM) security, to establish a mechanism for addressing cyber security issues. The Committee noted that the ICAO *Air Traffic Management Security Manual* (Doc 9985), was now available.

2.4 WAKE TURBULENCE

2.4.1 The Committee was made aware of and fully supported the cooperative work, currently on-going, aimed at preparation of ICAO's validation and implementation guidance material in support of static aircraft pair-wise wake turbulence separation minima. The Committee agreed that there would be advantages of potentially advancing timescales associated with the related modules. The Committee noted the intention of several States to directly support the existing working arrangements of ICAO on this matter, underscoring the importance of a safety-first approach to the development of new harmonized, global wake turbulence separation minima. In recognizing the capacity improvements offered by dynamic wake turbulence separation implementations, the Committee fully supported the development of associated validation and implementation guidance material within the existing ICAO working arrangements addressing the matter.

2.4.2 Recognizing that safety risks associated with wake turbulence may extend beyond the arrival and departure phases of flight and the potential for overall increased levels of safety with respect to wake turbulence offered by appropriate real-time airborne and/or ground-based wake turbulence monitoring and alerting systems, the Committee agreed that ICAO should pursue, within the existing ICAO working arrangements addressing wake turbulence, the development of an ICAO integrated flight safety system “wake vortex flight safety system (WVSS)” concept, system architecture and cost-benefit analysis. Furthermore, the Committee agreed to invite ICAO to consider the possibility for inclusion of WVSS within the relevant blocks.

2.5 **PERFORMANCE BASED-NAVIGATION – TERMINAL**

2.5.1 Under this item, the Committee acknowledged the notable work that had already been completed by ICAO and its partners to support the global implementation of performance-based navigation (PBN) but also recognized that there is a shortfall in meeting Assembly Resolution A37/11 regarding production of State PBN implementation plans and instrument approach procedures with vertical guidance. Consequently, the Committee recognized that States still required assistance with PBN implementation especially in the areas of operational approvals and training of personnel. However, it was highlighted that the resources to support PBN were extremely limited and must be managed effectively. The Committee agreed that ICAO should continue to provide support, with assistance from States, international organizations and industry, in order to facilitate the timely implementation of PBN.

2.5.2 The Committee acknowledged the need for additional ICAO provisions to support specific PBN applications for specific situations including PBN standard terminal arrival routes (STARs) for simultaneous parallel runway operations.

2.5.3 The Committee agreed to the development of separation standards to support all PBN specifications and which will also allow for operations where mixed navigation performance requirements are in effect.

2.5.4 The Committee discussed the application of ground-based augmentation systems (GBAS) for standard instrument arrivals and departures and agreed that further analysis of the requirement was necessary.

2.5.5 The Committee also recognized that airport authorities are a key stakeholder and need to be involved early in the PBN planning process in order to address/mitigate potential impacts such as community noise exposure and airport infrastructure requirements.

2.5.6 The Committee supported the sharing of required navigation performance authorization required (RNP AR) implementation and flight operational safety assessment (FOSA) documentation as a means to inform States with examples of the safe implementation of RNP AR procedures.

2.5.7 The Committee endorsed the aviation system block upgrade modules (ASBUs) relating to airport capacity included in Block 1, and agreed in principle to the ASBU modules relating to airport capacity included in Blocks 2 and 3 as the strategic direction for this subject.

2.6 On the basis of the discussions, the following recommendations were accepted by the Committee:

Recommendation 2/1 – ICAO aviation system block upgrades relating to airport capacity

That the Conference:

- a) endorse the aviation system block upgrade modules relating to airport capacity included in Block 1 and recommended that ICAO use them as the basis of its standards work programme on the subject;
- b) agree in principle to the aviation system block upgrade modules relating to airport capacity included in Blocks 2 and 3 as the strategic direction for this subject;
- c) recommend that the ICAO Council supports the implementation of the APEX in Safety Programme and asks the Secretary General to continue ICAO participation in safety reviews and sharing of relevant safety information, as provided for in the Memorandum of Cooperation between ACI and ICAO;

That ICAO:

- d) include, following further development and editorial review, the aviation system block upgrade modules relating to airport capacity in the draft Fourth Edition of the *Global Air Navigation Plan*;
- e) States and service providers ensure that airport capacity, including relevant airport planning and operational issues, are addressed and accounted for when planning for air traffic management capacity and system performance;
- f) work with the Airports Council International (ACI) and other interested parties on guidance material to promote the globally-harmonized implementation of airport collaborative decision-making, including best practices and global technical standards; and

That States:

- g) according to their operational needs, implement the aviation system block upgrade modules relating to airport capacity included in Block 0.

Recommendation 2/2 – Development of ICAO provisions for remotely operated air traffic services

That ICAO provide:

- a) updates on additional guidelines for surveillance and air and ground communications systems;
- b) requirements for the use of sensors and display technologies to replace visual observation to air traffic in the provision of air traffic services; and
- c) requirements for air traffic services (ATS) personnel and flight crew training, ATS personnel licensing and related procedures for remotely operated air traffic services.

Recommendation 2/3 – Security of air navigation systems

That ICAO:

- a) seek the support of States and stakeholders to complete its work in developing a robust, secure aeronautical telecommunication network; and
- b) establish, as a matter of urgency, an appropriate mechanism including States and industry to evaluate the extent of the cyber security issues and develop a global air traffic management architecture taking care of cyber security issues.

Recommendation 2/4 – Optimized management of wake turbulence

That ICAO:

- a) accelerate the implementation of new ICAO wake turbulence categorization systems and to pursue development of dynamic wake turbulence separation provisions with supporting implementation guidance;
- b) support the continuation of the cooperative work on-going addressing the static pair-wise separation, with a view to having revised global provisions in place in advance of Block 1 timescales; and
- c) develop the wake vortex flight safety system (WVSS) concept description along with a proposed system architecture with the possibility for WVSS to be included in the aviation system block upgrade Modules B1-70, B2-70, B1-85 and B2-85.

Recommendation 2/5 – Performance-based navigation for terminal and approach operations implementation

That States and stakeholders:

- a) urgently implement, where appropriate, performance-based navigation for terminal and approach operations in accordance with Assembly Resolution A37-11;
- b) urgently adopt efficient operations approval procedures and support the mutual recognition of other States' operational approvals;
- c) share their best practices including required navigation performance authorization-required implementation initiatives as well as relevant flight operational safety assessment documentation with other States;
- d) determine operational requirements in support of their airspace concept in accordance with the processes described in the *Performance-based Navigation (PBN) Manual* in order to select the appropriate PBN specification;
- e) including regulators, airport authorities, air navigation service providers, commercial operators, General Aviation and the military, work together at all levels and in close coordination to ensure successful performance-based navigation implementation;

That:

- f) international organizations and industry continue to provide resources to support ICAO with the development of provisions, guidance and training material in support of performance-based navigation implementation; and
- g) States, when considering performance-based navigation routes arriving at and departing from airports, should ensure that air navigation service providers and aircraft operators involve airport operators from the outset so that they may consult fully with local communities in order to avoid adverse noise impact on those communities.

Recommendation 2/6 – Development of ICAO provisions for performance-based navigation for terminal and approach operations

That ICAO study and make appropriate additions where required to the ICAO provisions, including:

- a) required navigation performance authorization-required departure navigation specification;
- b) the application of performance-based navigation standard terminal arrival routes for en route independent simultaneous approaches;
- c) assessment of the need for ICAO provisions on the use of ground-based augmentation system to append standard instrument arrival and standard instrument departure procedures to approach and landing trajectory;
- d) development of separation minima to support all performance-based navigation specifications and which will also allow for operations where mixed performance requirements are in effect;
- e) advanced use of performance-based navigation to support aviation system block upgrade modules;
- f) continued development of provisions, guidance and training material in support of performance-based navigation implementation; and
- g) develop and make available the minimum qualification requirements for personnel to attend performance-based navigation procedure design training.

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