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Agenda Item 2: Review of the implementation of the Regional Air Navigation Plan

a) Review of improvements to the regional ATM

REVIEW OF PERFORMANCE BASED NAVIGATION (PBN) INITIATIVES AND NEED FOR ADVANCEMENT OF OPERATIONAL APPROVAL AND FLIGHT VALIDATION EXPERTISE

(Presented by the United States)

SUMMARY

The United States Federal Aviation Administration (FAA) places a high priority on the development of harmonized standards and recommended practices for procedure design, aircraft and operator approvals, and air traffic procedures. This statement is especially true in the area of Performance Based Navigation (PBN), a foundational program for the U.S. Next Generation Air Transportation System (NextGen), where the need for a convergence of criteria is vital. The international aviation community has widely recognized the safety, efficiency, capacity and other benefits possible with PBN. This paper discusses some of the FAA's recent PBN activities in the ICAO Caribbean/South America Regions (CAR/SAM) and encourages States to develop the necessary expertise regarding operational approval and flight validation for safe implementation.

1. Introduction

1.1 The Federal Aviation Administration (FAA) is committed to the development of harmonized standards and recommended practices for air traffic route and instrument procedure design, aircraft and operator approvals, and air traffic procedures. This is especially true in the area of Performance Based Navigation (PBN), which encompasses both Area Navigation (RNAV) and Required Navigation Performance (RNP) operations. PBN is a foundational program for the U.S. Next Generation Air Transportation System (NextGen), where the need for a convergence of criteria is vital.

1.2 The international aviation community has widely recognized the safety, efficiency, capacity, and other benefits possible with PBN. The International Civil Aviation Organization (ICAO) *PBN Manual* (Doc 9613) was published in 2007, providing a globally harmonized set of aircraft and operator requirements (called "navigation specifications") for several types of RNAV and RNP implementation. ICAO 36th Assembly Resolution A36-23 (Sept 2007) calls for regional and State PBN Implementation Roadmaps to be developed by the end of 2009, as well as setting specific PBN implementation targets, to which all ICAO Member States have agreed.

1.3 In addition to a number of PBN global harmonization and education activities, carried out primarily in various ICAO forums, the FAA has joined with a number of partners in the South American (SAM) region, and beyond to advance PBN. These efforts have produced tangible achievements in terms of safety, access, and efficiency.

1.4 A solid framework for PBN implementation has begun to take shape, primarily because of vital information-sharing and coordination among the various stakeholders. By continuing to work together, we will gain valuable experience for future implementations of performance based navigation.

1.5 The development of PBN-related operational approval procedures¹ and ongoing safety assurance processes should be of specific interest for overall success.

2. PBN Initiatives

2.1. The ICAO Caribbean/South America Regions (CAR/SAM) have been at the forefront of ICAO PBN strategic planning, as well as its activities to advance readiness for PBN implementation in its Member States. The CAR/SAM PBN Roadmap, developed by Member States in 2006 and approved by the Grupo Regional de Planificación e Implantación del Caribe y Sudamérica (GREPECAS) in April 2007, is a notable example of regional. It was approved several months before ICAO Resolution A36-23 on PBN.

2.2 More recently, the FAA has been privileged to participate as an observer at the ICAO SAM Region Implementation Group (SAM/IG), where specific PBN implementation activities are undertaken. The ICAO SAM Region's Model PBN Implementation Plans (En-route, Terminal and Approach) have been shared by ICAO Headquarters with other ICAO regions as examples to follow. The SAM/IG has initiated a program to develop model Advisory Circulars, intended to provide SAM States with example texts to embody ICAO PBN Manual navigation specifications into their national regulations. ICAO Headquarters also is sharing SAM model Advisory Circulars with other Regions as they become available, as extremely useful examples to assist other Regions.

2.3 From 2005 to 2007, FAA personnel assisted with the implementation of RNP approach procedures in Quito, Ecuador. This coordination resulted in the publication and operational use of RNP instrument approach procedures² at Mariscal Sucre International Airport, which have significantly improved safety and reduced diversions.

2.4 In the CAR region in 2006, FAA personnel conducted a PBN workshop and assisted in the development of instrument approach procedures for the personnel of Corporación Centroamericana Servicios de Navegación Aérea (COCESNA) in Tegucigalpa, Honduras. This workshop was attended by Air Traffic and Aeronautical Information Service personnel from five Central American countries (Honduras, Belize, El Salvador, Nicaragua, and Guatemala) and Mexico.

¹ Issue previously assigned to Project RLA/99/901 (Regional Safety Oversight Cooperation System) at SAM/IG/2 under Agenda Item3- *Standards and Procedures for Performance Based Navigation Operations Approval*.

² This procedure, while designed prior to the development of the PANS OPS design criteria of ICAO Doc 9905, shares many attributes with the category of operations known as RNP Authorization Required (RNP AR). The procedure at Quito also requires specific authorization be obtained by operators prior to use.

2.5 Later in 2006, the FAA conducted meetings in El Salvador with representatives of the aviation regulatory authorities of Honduras and El Salvador, as well as interested air carriers, to promote an understanding of the airworthiness and operator requirements to safely implement upcoming procedures. As a result, a number of procedures were implemented in El Salvador and Honduras, including the 2008 publication of an RNP Authorization Required (RNP AR) procedure at Toncontín International Airport in Tegucigalpa.

2.6 In August 2008, Brazil, Chile, and Mexico sent experienced PANS OPS procedure designers to the prototype three-week U.S. Transportation Safety Institute (TSI) procedures design (RNP AR) course in Oklahoma City, Oklahoma, which provided FAA Flight Standards approved technical training and enabled TSI to get valuable feedback on course design. *Note: TSI is an agency of the U.S. Department of Transportation, as is the FAA.*

2.7 In June 2008, FAA Flight Standards, Aircraft Certification, and Air Traffic experts participated with counterparts from the European Organization for the Safety of Air Navigation (EUROCONTROL) in the presentation of two ICAO Performance Based Navigation Seminars in Lima, Peru, and Santo Domingo, Dominican Republic. These seminars, presented to stakeholders from a variety of agencies and operators, provided a detailed introduction to the ICAO PBN Manual and the technical requirements of the harmonized RNAV and RNP navigation specifications it contains.

3. Conclusions

3.1 While the potential benefits are substantial, significant challenges remain for continued implementation of PBN. A collaborative decision making process and coordination among aviation regulator, operator, and air navigation service provider stakeholders is essential to successful PBN implementation, as is the accrual of the requisite knowledge by representatives of each expertise. State regulator personnel must receive a suitable amount of education and training in order to evaluate and, as appropriate, approve various PBN operations. Similar education and training of procedure design and flight validation personnel must be accomplished to ensure PBN procedures are safely designed and properly flight validated prior to publication and operational use.

4. Suggested Actions

The Meeting is invited to:

- a) note the contents of this paper, and
- b) promote activities that will further the development of performance based navigation, including training seminars related to operational approvals and flight validation.