INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY SEVENTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/27)

Bangkok, Thailand, 5 to 8 September 2016

Agenda Item 3: **Performance Framework for Regional Air Navigation Planning and Implementation**

3.4: **CNS**

NEW GENERATION CNS EQUIPMENT VALIDATION AND CERTIFICATION IN CHINA

(Presented by People's Republic of China)

SUMMARY

This paper presents CAAC new generation CNS equipment validation and certification programs. Using GBAS as an example, the validation and certification processes are described, including Technical Review, System Ground Test, Flight Test, Ground Operational Verification and Flight Operational Verification.
Strategic Objectives:

A: ***Safety*** *– Enhance global civil aviation safety*

1. INTRODUCTION

1.1 Communication, Navigation and Surveillance System is the infrastructure to provide safe and efficient services for civil aviation. To ensure the CNS equipment compliance with ICAO's SARPs and meeting the operational requirements, Civil Aviation Administration of China (CAAC) established the CNS equipment validation and certification system in 2002 and continued to improve it.

1.2 To deal with the booming growth of air traffic, CAAC encourages the development and implementation of satellite based new generational CNS technology and systems such as Ground Based Augmentation System (GBAS) and Automatic Dependent Surveillance – Broadcast (ADS–B). The validation and certification system has been updated to adapt new products and requirements.

2. DISCUSSION

2.1 CAAC CNS equipment validation and certification processes cover the phases of system design, development, manufacture, quality control, after sales services inspecting etc. It sets up the rules and procedures of certification and provides means of quality control system evaluation for the manufacture, design review and factory testing, onsite stability and reliability testing to eliminate the potential defect issues at any stage of system development and manufacture. The validation and certification is based on ICAO SARPs, operational requirements and relevant technical specifications.

2.2 Validation and Certification of New generation CNS systems.

2.2.1 In view of some of the new generation CNS systems that has not been fully verified in China is gradually emerging in recent years. CAAC is updating validation and certification program for related systems. Take the GBAS system as an example, the validation and certification program mainly includes the followings.

[Technical Review]

- General Document Review

Review the manufacture qualification documents, such as Quality management system document.

- System Design Document Review

Requires a qualified, independent organization to check system's compliance with standards and review documentation and design artifacts. The tasks and responsibilities are to review the following:

1. Compliance with the requirements in standards or acceptable waivers or deviations
2. Compliant System Engineering activities
3. Compliance with System Safety
4. System Verification compliance5. Hardware Design Assurance
6. Software Design Assurance
7. Training Material

- Supplementary Technical Document Review

Assessing system's compliance documentation for additional requirements identified in related standards of CAAC that mainly focus on the following aspects:

1. Electromagnetic compatibility
2. Lightning protection class
3. Low-Latitude operation
4. High altitude operation

[System Ground Test]

- According to specifications and standards of ICAO and CAAC, make plans for GBAS system ground test to verify system function and performance compliance with the requirements.
- According to the requirements of system operation& maintenance, assess maintainability and reliability.

[Flight Test]

- Perform flight test according to ICAO Doc 8071 to verify the compliance with requirements of ICAO and CAAC.

[Ground Operational Verification]

- Operate the system over continuously over an extended period to review of system event / fault logs and evaluate the basic stability of the system.
- Use special equipment to monitor GBAS system signal for long-term. Analyze and assess system accuracy, continuity and availability.

[Flight Operational Verification]

- Verify operational capability of GBAS CAT-I service by preforming CAT-I approaches using commercial aircrafts.

2.3 The validation and certification programs of Automatic Dependent Surveillance – Broadcast (ADS–B), Multilateration (MLAT), Advanced-Surface Movement Guidance and Control Systems (A-SMGCS) have already been established. CAAC will continue to develop and optimize the programs of new generation CNS systems.

2.4 In view of the application of new generation CNS technology is continually increasing in the Asia-pacific region recent years. China is willing to share experience of the CNS System validation and certification with other states.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to note the information contained in this Paper.

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