INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY SIXTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/26)

Bangkok, Thailand, 7 – 10 September 2015

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

3.4: CNS

IMPLEMENTATION OF IP BASED VCCS/VHF FOR UPPER AIRSPACE HARMONISATION IN INDIA

(Presented by India)

SUMMARY

India is harnessing appropriate CNS system technologies, including the use of IP Based Voice Control and Communication System (VCCS)/VHF Radios and advanced ATM Automation systems, to cope with the phenomenal growth of air traffic. One of the major ANS initiatives in enhancing safety, efficiency and increasing airports & airspace capacity is Upper Air Space Harmonization in Indian Air space.

This paper highlights implementation of new state-of-the-art IP Based VCCS/VHF Radios and ATM Automation System, enhanced and overlapping ATS surveillance/VHF coverage by networking of systems in implementing Upper Air Space Harmonization in Kolkata and Delhi FIR.

This paper relates to –

Strategic Objectives:
A: Safety – Enhance global civil aviation safety
C: Environmental Protection and Sustainable Development of Air Transport – Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment

Global Plan Initiatives:
GPI-3 Harmonization of level systems
GPI-4 Harmonization of upper airspace

1. INTRODUCTION

1.1 Indian airspace contains a number of relatively large sectors with significant over-sea components. In view of huge traffic growth, the rationalization of air space is considered necessary to cope with the increased air traffic.

1.2 To enhance capacity and reduce delays, India has drawn up plans to restructure airspace to enhance flight handling efficiency through use of appropriate technology.

1.3 In line with ICAO Global Air Navigation Plan, India has taken major initiatives to enhance safety, efficiency and airspace capacity through installation of ATM Automation Systems, improved ATS surveillance coverage with installation of Radars (MSSRs) and ADS-B ground receivers and implementation of Data Links for departure clearance.

1.4 India has taken up Upper Airspace Harmonization programs within the Indian FIRs through integration of Surveillance Sensor data (Radar & ADS-B) along with an efficient and seamless VHF communication System network.

1.5 This paper highlights capabilities of an Advance IP Based VCCS/VHF Radio systems being used for providing seamless VHF communication System network part of Upper Airspace Harmonization program within the Kolkata FIR and work is in progress for implementation in Delhi FIR.

2. DISCUSSION

2.1 The Master plan for restructuring the entire Indian airspace, details that, each FIR will have only one Upper ACC centre with multiple sectors to be operated from four Metro ACC Centers at Chennai, Kolkata, Delhi and Mumbai thereby amalgamating existing 11 Upper ACCs into 4 Upper ACCs initially and subsequently into 2 Upper ACCs.

2.2 In view of complexity and magnitude, the task was planned in a phased manner. First phase was completed with restructuring of Chennai FIR. Second phase has recently been completed with Upper Airspace Harmonization in Kolkata FIR and implementation is in progress in Delhi FIR. Subsequently restructuring shall also be taken up for Mumbai FIR.

Implementation of state-of -art IP Based VCCS system at Kolkata ACC

2.3 Kolkata ATCC has been provided with an efficient VHF network with cross coupling technique to provide VHF coverage throughout the airspace even at lower levels. IP based Radios (VHF TX/RX) and VCCS system have been deployed for the first time in the country and is amongst one of the largest networks using IP based system(s).

2.4 The IP based system implemented at Kolkata fully complies with the specifications of ICAO Doc 9896 and Euro CAE 137B.

2.5 VCCS with 100 IP based controller workstations installed.

2.6 VHF IP radios installed at thirteen remote network stations have been networked to provide seamless coverage to the routes operating in the FIR.

2.7 30 VHF frequencies using about 120 IP RadioTx/RXs provides seamless communication in entire Kolkata FIR.

2.8 With implementation of IP based VCCS and Radio at major ACCs, it will be possible to share Radio resources between these centre’s for optimum utilization apart from seamless operation from single ACC in case of operational requirement like emergency or contingency.

2.9 Necessary telecommunication infrastructure which presently uses MLLN is also being upgraded with dual redundant links which shall further be replaced by managed telecom IP-VPN MPLS based network by 2016-17.

2.10 Along with implementation of IP based Radio system at Kolkata, a state of art integrated ATM Automation system has also been commissioned at Kolkata. The advanced ATM Automation system at Kolkata ATCC has sufficient redundancy to provide fail-safe operations.

2.11 The automation system is capable of integrating 35 RADARs, 32 ADS-B and 10 M-LAT sensors. Already 9 RADARs and 8 ADS-B sensors have been integrated to provide an extensive surveillance coverage well beyond Kolkata FIR. The system is capable of 4D trajectory calculation and the accuracy of trajectory calculation is enhanced by GRIB2 data integration.

2.12 Benefits of the Upper Airspace Harmonization include harmonized ATM procedures, reduction in separation between aircraft resulting in increased airspace capacity utilization and enabling aircraft to get User Preferred Flight Profile and consolidating and deconsolidating sectors dynamically depending on traffic density besides fuel savings and reduction in carbon emission.

Implementation of state-of -art IP Based VCCS system at Delhi ACC

2.13 Similar IP Based VCCS and Radios have been planned for upper air space harmonization in Delhi FIR and is planned for implementation shortly.

2.14 A new ACC Complex is also being commissioned at Delhi soon. The ACC along with implementation of IP based Radio system as mentioned above will have a new state of art integrated ATM Automation system and other CNS/ATM Facilities operational. The CNS/ATM systems being planned at Delhi ACC have sufficient redundancies to provide fail-safe operations.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) note the information contained in this paper;

b) note India’s initiatives to establish a single continuum of upper airspace enabled through state of art IP based VCCS/Radios, ATM Automation Systems, Surveillance and Communication networking in India; and

c) discuss any relevant matters as appropriate.

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