



International Civil Aviation Organization

WORKING PAPER

AN-Conf/13-WP/208
19/9/18
(Information Paper)
English only

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE A

Agenda Item 3: Enhancing the global air navigation system

3.1: System-wide information management (SWIM)

IMPLEMENTATION OF COMMON AERONAUTICAL VIRTUAL PRIVATE NETWORK (CRV) AND FUTURISTIC TELECOMMUNICATION INFRASTRUCTURE (FTI)

(Presented by India)

EXECUTIVE SUMMARY

India is a participating member of the ICAO Asia Pacific Common Aeronautical Virtual Private Network (CRV) and has finalized plans to hook up with the system backbone with national system. In order to meet the challenge of growing air traffic and to ensure safety in multi-stakeholder environment, robust and highly reliable telecommunication links are required for transportation of aviation data in real time. As such the aviation community is moving towards managing and exchanging high quality information among all stakeholders and across all information domains under system-wide information management (SWIM) environment, for which a reliable telecommunication infrastructure is an essential requirement. In this context, India is implementing Futuristic Telecommunication Infrastructure (FTI) which will provide high availability of SLA based telecommunication links to connect various locations using Latest Technology and redundant communications infrastructure.

1. INTRODUCTION

1.1 In accordance with the GANP, advancement made in Tele-communication infrastructure needs to be utilized in order to increase the efficiency of different air traffic management (ATM) applications pertaining to air traffic control, air traffic flow management and flight information sharing. In this context, India has taken up implementation of Futuristic Telecommunication Infrastructure (FTI) for its air navigation services, which will provide high availability of links between various sites and airports.

1.2 Currently, aeronautical fixed telecommunication network (AFTN) and aeronautical message handling system (AMHS) services operate over point to point international leased circuits in ICAO Asia Pacific Region, which are subject to limitations such as obsolescence, lack of standardization, duplication of services, poor escalation process etc.

1.3 Therefore, to overcome the issues and constraints of existing telecommunication network across various states, Common Aeronautical Virtual Private Network (CRV) is under implementation in the Asia Pacific Region to facilitate common service provider across the region.

2. DISCUSSION

2.1 India as a participating member of CRV in the Asia Pacific Region of ICAO, has finalized plan to be part of CRV. CRV network is a dedicated multiprotocol label switching (MPLS) internet protocol based Virtual Private communication Network provided by a common network service provider and support all aeronautical fixed services in the APAC region.

2.2 The CRV network enables and facilitates a number of aviation system block upgrade (ASBU) modules, including B1-SWIM, B1-FICE (flight and flow information for a collaborative environment) and also covers the current limitations (such as obsolescence, lack of standardization, poor escalation processes and other aeronautical communication deficiencies) of point to point international leased circuits.

2.3 Intended services by the CRV network includes AMHS/AFTN circuits, transportation of ground-ground voice communication, ground-ground surveillance data, AIDC data, AIM data, ATFM data, and SWIM data.

2.4 In accordance with the fifty fourth Asia /Pacific DGCA conference action item, the target date of CRV implementation is no later than 2020 in the APAC region. Accordingly, AAI is in the process of executing contract with the common service provider in the fourth quarter of 2018 with tentative service readiness in first quarter of 2019 with BBIS States first and with BIS States subsequently.

2.5 As regards India's initiative for implementation of CRV, India is implementing FTI which will provide high availability SLA based telecommunication links to connect various locations using Latest Technology and redundant communications infrastructure. The FTI will provide high availability SLA based telecommunication links between ninety two locations using Latest Technology equipment and communications infrastructure at each AAI location.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information in the paper regarding progress made by India in strengthening the communication infrastructure within the State and plans for cross-border cost-effective telecommunications network with other APAC States.

— — — — —

APPENDIX

SYSTEM ARCHITECTURE

1. FTI is a **network of Dual Telecommunication links** for transportation of aviation data from one location to multiple locations using IP MPLS technology. FTI will provide high availability SLA based telecommunication links in between ninety two locations using Latest Technology equipment and communications infrastructure at each location. For highly sensitive applications, where real time data is of great significance, three point to point and one V-SAT link has been provisioned for achieving RMA-1 (i.e. 99.999 %) availability.
2. **Centralized Monitoring:** Performance of these links will be continuously monitored at Network Operation Control Centre (NOCC) at Delhi and Bangalore for various parameters like availability, latency, jitter and packet loss etc. to meet the global ATM application performance requirement. All telecommunication links and each network equipment will be centrally monitored 24/7 for immediate response to fix any outages.
3. **Security Operation Control Centre (SOCC):** Security Operation Control Centre (SOCC) at Delhi and Bangalore will protect the network from cyber threats. All service connections and each equipment will be security hardened, monitored, and safeguarded against intrusion 24/7 with constant system updates against latest security threats.
4. The initiative will upgrade network operations, enhance security, and improve the performance, reliability and quality of India's ATMtelecommunications network and a 15 year contract on Build Own Operate (BOO) Model has been entered with the vendor.
5. FTI High Level Architecture will result in 99.9 to 99.999 % availability of network to support real time services as per user requirement. All connections have at least two paths that switch automatically if there is a failure and end-user is not affected. Service connections configured to connect directly to AAI equipment, eliminating need for modems and other interface equipment prone to failure. Annexure-1 & 2.
6. **Bandwidth Availability:** Services are networked to high-bandwidth equipment and paths to provide efficient space, cost, and fast upgrades as needed, while using all of AAI's existing equipment technology and protocols.
7. **Performance based Network:** MSP provides daily and monthly reports in real time of performance of each service connection and shall pay penalty for not meeting SLA.
8. **Disaster Recovery:** 24/7 NOCC & SOCC will also have mirrored operations between Delhi and Bangalore in case of any failure or natural disaster. Entire FTI network will be designed to continue operations even without NOCC & SOCC in case of catastrophic failure.
9. Project will be implemented in nine phases and likely to be completed within 30 months from the signing of the contract i.e. 10 May 2018.
10. Details of FTI High Level Architecture are as given Figure1 and 2.
Figure-I FTI High Level Architecture (99.999% Availability)

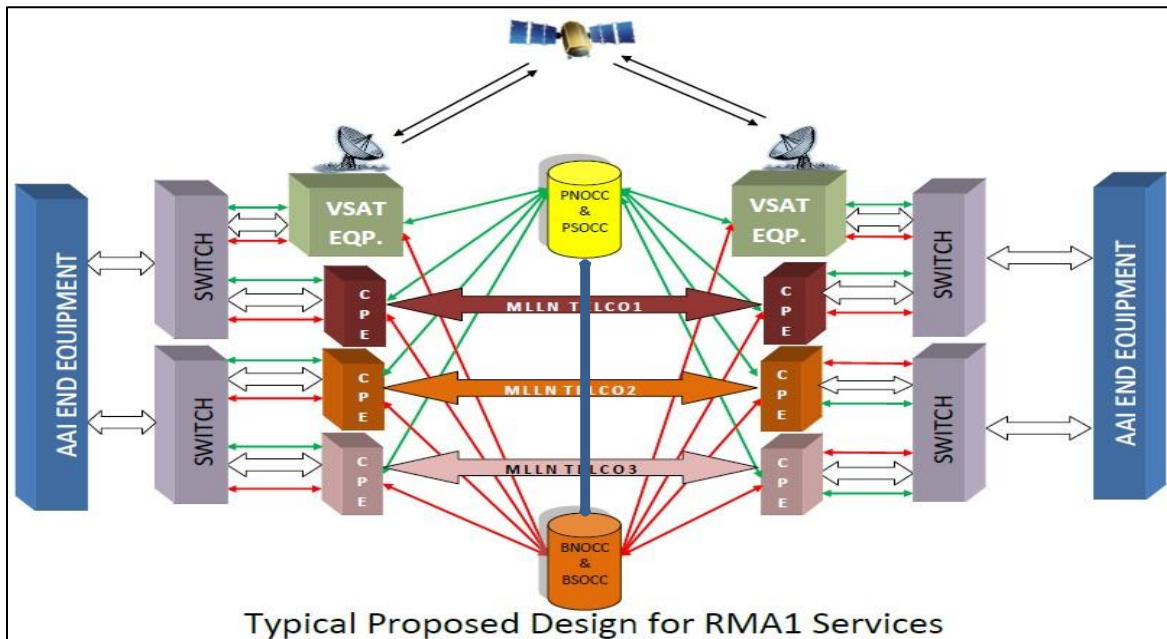
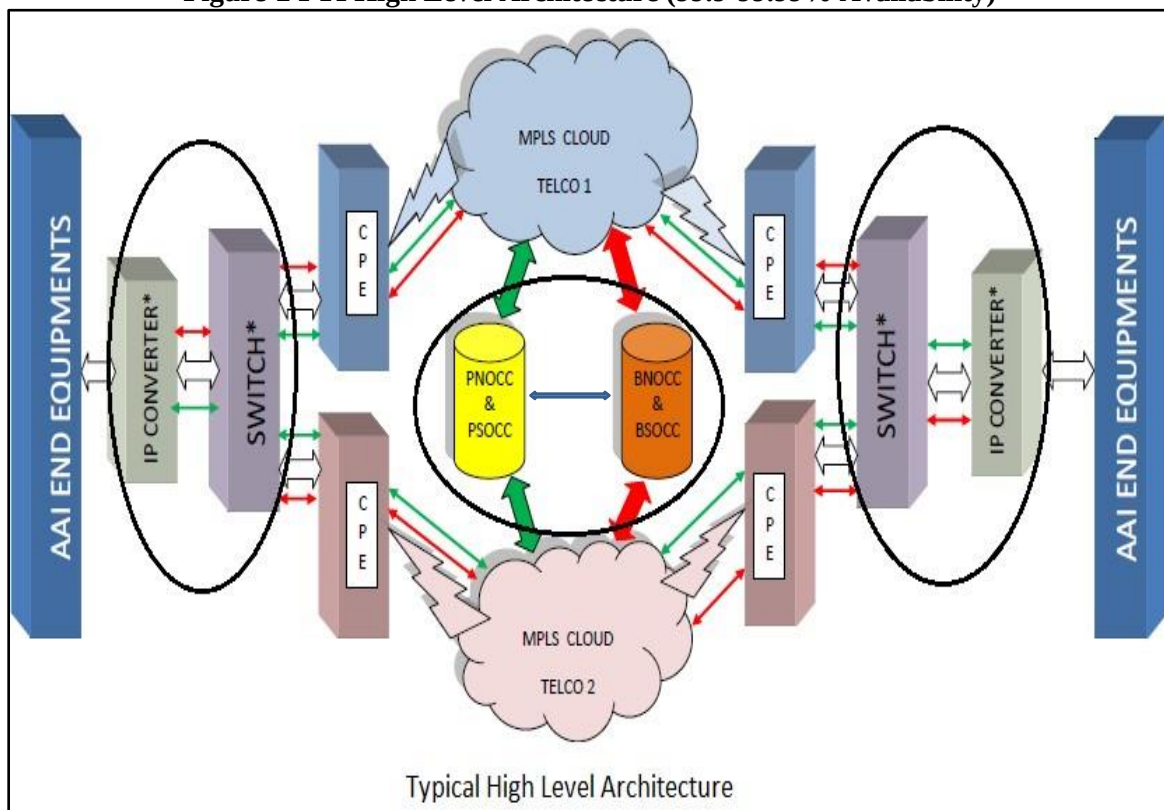


Figure-2 FTI High Level Architecture (99.9-99.99% Availability)



— END —