

International Civil Aviation Organization



**THE SECOND MEETING OF THE COMMON
REGIONAL VIRTUAL PRIVATE NETWORK
TASK FORCE (CRV TF/2) OF APANPIRG**

Seoul, Republic of Korea, 12 May 2014



Agenda Item 3: Review Cost benefit analysis (first iteration) result

COST BENEFIT ANALYSIS (FIRST ITERATION)

(Presented by Japan, India, Australia and the Secretariat)

SUMMARY

This paper introduces the Cost Benefit Analysis (CBA) to implement the Common Regional Virtual Private Network (CRV) in Asia/Pacific Region based on the survey by 'Data collection for Cost-benefit Analysis of the CRV network' (AP170-13-CNS, 18th Dec. 2013). This CBA document evaluates options that will help APANPIRG and the member states to take a decision for joining the CRV network and plan their budget accordingly.

1. Introduction

1.1 The First Meeting of the CRV Task Force elaborated a work plan for carrying out the study mandated by the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) under Decision 24/23 Common Regional Virtual Private Network (VPN) Task Force.

1.2 It was recognized that such a service could be considered as a multinational service, as per ICAO Document ASIA/PAC BASIC ANP Doc9673, and that such approach would require a cost benefit analysis to make sure that the project was cost efficient and beneficial for both developing and advanced States. The task was initiated to collect data from various member States in order to better define the recurring costs and problems associated with the current configurations. Every State or Administration of the Asia/Pacific Region was invited to reply to this survey to ICAO Asia and Pacific Office (ICAO APAC Survey).

1.3 Fifteen organization including one ANSP and fourteen States, have positively contributed through the ICAO APAC Survey. This CBA document analyzed the reports based on the survey of these States and evaluates options that will help APANPIRG and the member States to take a decision for joining the CRV network and plan their budget accordingly.

2. Current status

2.1 Currently, Aeronautical Fixed Telecommunication Network (AFTN) and AMHS services in the Asia/Pacific Region are operated over point-to-point international private lines (IPL). This network configuration exhibits a number of limitations, including (but not limited to):

- Half circuit arrangement between States is increasingly difficult to order and time consuming;
- Circuit upgrades between states is also impacted due to variable pricing and bandwidth availability of the half circuit at each State;
- Dynamic routing is not supported due to limited bandwidth and no central administration of the network;
- Incompatible network protocol do not support Extended Service as specified in ‘Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols (ICAO Doc9880)’;
- New features enhancement as recommended by ICAO 12th Air Navigation Conference such as System Wide Information Management (SWIM) is not supported;
- Network security measures cannot be implemented which leads many States to implement their own security measures and policy adding to overall costs; and
- Different budget cycles and priorities between States make the synchronization of upgrades difficult and in turn limit the seamless distribution of Aeronautical Fixed Service (AFS) data.

3. Result of the Cost Benefit Analysis

3.1 The CBA document has studied two scenarios: introducing and not introducing a common aeronautical regional network in the Asia/Pacific region. Cost and benefit analysis was performed for the two scenarios.

3.2 Scenario 1 (Do nothing) is the case of not introducing the CRV. In the Benefit analysis, this chapter refers summarized cost of current link infrastructure from ICAO APC Survey (Type of circuits in use, Bandwidth in use, Ratio of Landline to Satellite circuits). Also, by the reports from States, it found following issues:

- Inability to support GANP technology roadmap
- Difficult to expand / manage ground-ground communications (lack of scalability and manageability)
- No common interface – different interfaces due to different technologies used such as X.25, VSAT, etc.
- Obsolescence

3.3 In addition, by the Cost analysis, it was recognized that current predictable cost may be seen that the present method of constructing the network by IPLs to meet the existing requirements in near future, the cost to maintain the circuits will continue to upwards from yearly US\$ 5 million presently being used by 15 States in ICAO APAC Survey.

3.4 Scenario 2 (Move to CRV) is the case of introducing the CRV. Similarly, it was analyzed about the Benefit and Cost, accordingly, it indicated the advantage to meet following issues:

- Support Global Air Navigation Plan (GANP) roadmap
- CRV technology is the enabler for future services (SWIM, ASBU/B0-FICE):

Furthermore, in the aspect of Cost analysis, if it would be analyzed by conservative and modeling approach, Scenario 2 has the advantage of Cost benefit in following phases.

- Initial One-off deployment costs
- Total cost of ownership over 10 years

3.5 The Summary of Cost benefit analysis for the CRV is as Appendix 1.

3.6 Regarding the accuracy of this CBA, as planned in the CRV planning, CRV Task 27 “Data Collection All states” and Task 28 “Update CBA for ACSICG/2 from RFI” may bring new elements. Particularly the Task 27 Data Collection All states may be used to update the Scenario 1 actual costs to a larger set of States (currently 15 States participated). In this case the Scenario 2 should also be updated to encompass the same number of Parties.

Besides, Task 28 “Update CBA for ACSICG/2 from RFI” could be used to ascertain the assumption made in Paragraph 2.2.2.2 on the cost reduction according to APANPIRG/24 - WP/20 Proposed Asia/Pacific Internet Protocol (IP) Virtual Private Network (VPN).

Nevertheless it is not expected that such updates would change dramatically the assessment that the Scenario 2 is definitively more cost efficient and operationally needed by the APAC Region, considering the expected traffic growth in the coming years.

4. Action by the Meeting

4.1 The meeting is invited to:

- a) Review the CBA placed in Attachment A;
- b) Adopt the following Draft Decision:

Draft Decision 2/X - CRV Cost Benefit analysis

That the first iteration of the CRV Cost Benefit analysis, as provided in Annex 1 to this paper, be adopted; and

- c) Discuss any matter as appropriate.

Appendix 1

	Scenario 1 – Do Nothing (based on ICAO survey)	Scenario 2 – Move to CRV
Quantitative benefit		
Cost	Scenario of reference Costs increase induced by greater connectivity is exponential	Expected reduction of the total cost of ownership by 23% over 10 years for 15 States (same number as for Scenario of reference) Initial one-off deployment efforts paid back in one to two years Costs increase induced by greater connectivity is linear
Performance	Lower performance due to low speed/obsolescent technology and unsuitable design	Better performance based on performance and safety monitoring, and ad hoc design including high speed technology (1~2 Mbps connectivity)
Diversity	Fallback solutions by Operator when available	Solutions available on the market (logical fallback on IP-VPN and physical diversity etc) but shall be required through user requirements and monitored
Reactivity (Delays)	Longer period to implement a new line with poor control of delays (a couple of months) Poor synchronisation in change management between APAC States	Reduced time to coordinate and implement any upgrade following pre-established and homogeneous contractual requirements (a couple of weeks)
Qualitative benefit		
Safety	Lay down by Point to point, secured by physical	Ensured through network design
International commitment	Not possible to meet ICAO GANP objectives	Possible to meet ICAO GANP objectives
Contingency	Manage with coordinating each half-circuit by both Service Providers	Manage a whole network by Service Provider
Upgradeability	Need for new line and facility to upgrade Bandwidth	Easy to upgrade Bandwidth without installing additional facility