INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY FIFTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/25)

Kuala Lumpur, Malaysia, 8 – 11 September 2014

Agenda Item 3: Performance Framework for Regional air navigation planning and implementation

3.4 CNS

UPDATED DOCUMENTS FROM CRV TASK FORCE: MSA AND RFI

(Presented by the Secretariat)

CRV Management Service Agreement (MSA)

As a follow-up to an action taken in CRV TF second meeting, an ICAO letter APAC State letter Ref. T 8/2.11 & T 8/10.21:AP093/14 (CNS) - Common Regional Virtual Private Network (CRV) Procurement (Stage 1), was sent out on 25 June 2014 to APAC States to request comments from States/Administrations to the CRV Management Service Agreement (MSA) before 18 July 2014.

Comments received from States are logged in the **Appendix A** Table of comments 01 September 2014.

The MSA, initially prepared by ICAO Technical Cooperation Bureau in coordination with the ICAO APAC Regional Office was reviewed by the CRV TF on 28 May 2014. Resulting comments are also recorded in the Appendix A, along with ICAO's answers.

Consequently, a new version of MSA was prepared and sent out to ICAO Legal Bureau on 1 August 2014.

This consolidated version of the MSA was submitted to the ICAO Legal Bureau, for requesting their comments on MSA. Comments from ICAO Legal Bureau were received on 29 August 2014 and incorporated in the MSA and its attachments, and logged in the Table of comments. This version is attached at **Appendix B** with its annex 1 **at Appendix C**.

The signing of MSA by Pioneer States has to take place before 15 December 2014.

The meeting is invited to adopt the MSA through the Draft Conclusion 18/11 – CRV Pioneer Parties, article I endorsed by the CNS SG/18 meeting.

Request for Information (RFI)

Following CNS SG/18 meeting, the RFI was finalized, receiving no comments from the CNS SG.

5 documents were prepared:

1) CRV Introduction (MS Word)

2) Request For Information (RFI) instructions

3) Response schedule (MS Word)

4) Site schedule schedule (Excel format)

5) The CRV Concept of Operations (version 0.6), for information

All documents were posted on the ICAO APAC website:
http://www.icao.int/APAC/Pages/CRV.aspx.

They are placed respectively at **Appendices D, E, F, G and H**.

Prospective service providers interested in responding to this RFI are asked to issue a written RFI Response by 03 November 2014.

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Document	Para	Origin	Comments received from APAC States/Administrations during CRV meeting 28 May 14 and through consultation by ICAO State letter	ICAO TCB's answer	ICAO Regional Office	ICAO Legal Bureau 29 August 14
MSA	All sections containing "Annex"	CRV TF	delete the "(es)" from "Annex(es)" or "(s)" from "Project(s)",	No need to delete the "(es)" from "Annex(es)" or "(s)" from "Project(s)", since this is template agreement and we can't predict at this point if there will not be another project or annex.		
MSA	1.4	CRV TF	The said services are considered approved if they are laid out in the Annex as the annex will be reviewed by ICAO TCB.	should not delete "shall be approved by ICAO", as previously mentioned, this is standard text and not a necessary change		
MSA	1.4	CRV TF	We suggest to add: "Unless otherwise agreed by the Parties, […]"	Comment LFS: we should not include "unless otherwise agreed by the Parties" as it is not possible to implement projects outside the scope of ICAO policies, practices, etc.		
MSA	1.4	CRV TF	Add "and subsequent variations."	fine with the suggested addition		
MSA	1.7	CRV TF	Add "and the changes to the Agreement shall be made in accordance with 7.2"	fine with the suggested addition		
MSA	1.8	CRV TF	What is the meaning of "contract for inputs required for the provision of the Services"? Is that expert inputs?	"inputs" is the generic term ICAO uses to indicate any number of services such as contracting experts, facilitating fellowships, procurement services, etc."		
MSA	1.8	CRV TF	The CRV meeting dated 28 May 14 considers that this approval may require a long time. This sentence may be deleted by ICAO TCB	agree to delete: "The recruitment of personnel and the signature of contracts shall be subject to prior approval by the Participating States", as this would not be practical.		
MSA	1.12	CRV TF	The total cost (Services and Administrative Charges) of the Project(s) including these additional funds shall not exceed the capped amount reflected in the Annex(es) without the prior agreement of the Participating States.	should not include the proposed text as ICAO does not operate with "capped" amounts, this is contrary to ICAO Financial Regulations and Rules and could potentially put ICAO in a financially liable situation, which is not acceptable to FIN or our auditors.		
MSA	2.1 & 2.2	CRV TF	Replace "estimated" by "capped"	as previously mentioned we can't make reference to a "capped" amount.		
MSA	2.4	CRV TF	Add "and shall not be obliged to pay or commit any sums"	the proposed change does not really affect the general purpose of the clause, so in keeping with the line that no unnecessary changes should be made, we should keep the original language already approved by LEB.		
MSA	2.6	CRV TF	Replace "requesting" by "Participating" States	fine with the suggested addition		
MSA	2.6	CRV TF	Add "and not exceeding the capped amount of the total cost (Services and Administrative Charges)"	again, must remove reference to "capped" amount		
MSA	2.7	CRV TF	Is that necessary that Parties' bank accounts be indicated in this MSA then?	we aenee that incluidne bank details of multiole States is not advisable.		
MSA	3.1 to 3.1.4	CRV TF	Replace "equipment and supplies" by "services" and "requested directly from the Participating States through an official communication to ICAO" by "otherwise agreed by the Parties".	we can't accept these changes as they are standard clauses in all our MSAs and CAPS agreements.		
MSA	3.1.1 and 3.1.2	CRV TF	Delete those subparagraph as they do not apply to CRV			
MSA	6.1	CRV TF	Add "For the Participant States: to the signatories of this MSA"	fine with the suggested addition		
Annex 1	Appendix B	ICAO RO	What do the miscellaneous costs cover?	As you may be aware, this is a standard budget line included in all of our project budgets, which may comprise of (but not limited to) UN common costs, security costs, insurance, communication costs, courier, bank charges, and third party transaction costs (i.e. UNDP).		
Annex 1		ICAO RO	Capped amount	As mentioned in our comments to MSA, we can't adhere to a "capped" amount principle. However, as also stated in the MSA, ICAO may not incur expenditures beyond the approved budget without express consent from the State (or States in this case). This is standard in all our technical cooperation projects.		
Annex 1	Page 2, section 1.12, last line	France	We noticed that, unlike the MSA main body, the annex doesn't refer to any "capped amount". The annex should be put in consistence with the text of MSA. We are supporting the notion of capped amount.	As mentioned in our comments to MSA, we can't adhere to a "capped" amount principle. However, as also stated in the MSA, ICAO may not incur expenditures beyond the approved budget without express consent from the State (or States in this case). This is standard in all our technical cooperation projects.		
Annex 2	Page 2, section 1.12 and section 2.1	France	Editorial: The same sentence is duplicated "The total cost …. participating states"		Done	
Annex 3	Page 3, section 2.1	France	Editorial: Should we replace "in the event that **the** Participating State" by "In the event that **a** Participating State"		Done	
Annex 4	Page 3, section 3.1	France	What is the precise meaning and framework of "otherwise agreed by parties" ? Could we precise the process of the kind of agreements?		This leaves open the possibility to have a variation on that topic in the future	
Annex 5	Page 5, section 7.1	France	Editorial: Is "both" relevant here?		"Both" deleted.	
MSA		Honk Kong China	While the provision of a "capped" amount is contrary to ICAO procedures, Hong Kong, China considers that the absence of such "capped" amount would put the Hong Kong Government in an uncertain and difficult financial commitment. It is therefore proposed to deliberate a feasible solution in the coming CNS SG/18 Meeting such that a balance can be made between Member States and ICAO TCB to facilitate the progress of the project as well as to mitigate the financial risk on both sides.		OK, this will be taken care of by the capped provisional budget by States, according to the outcome of CNS SG/18. Mention to capped amount in the MSA has been deleted.	
MSA		Japan	1. According to paragraph 3.1.1 of MSA, it seems that Participating States need to deposit the amount required by dividing into 3 times. On the other hand, according to the text in the state letter, Participating States are invited to deposit the necessary fund to ICAO's bank account before 31 JAN 2015. Which is the number of payment to ICAO once or three times? 2. Assuming 'three times' is right, when is the timing that Participating States should deposit to ICAO? And what is the percentage that Participating States should deposit at each time? The first 20%, the second 30% and the last rest 50%?	The actual payment for TCB services will be dictated by the Annex 1 (to the MSA) and not by the text in the Para 3 of the MSA (which talks about a phased payment schedule/invoicing according to the degree of advancement of the procurement process) . The Annex 1 states that " Funds will be provided by the Civil Aviation Authorities and/or related ANSPs as listed in Appendix A, in advance of commencement of the project". Hence there will be a single invoice for each participating State with 100% of its proportionate share indicated.		
MSA	1.4	Singapore	"The services shall be approved by ICAO and shall be specified in the Annex(es) to this Agreement and subsequent variations (hereinafter referred to as "the Services"). Such services shall be provided in accordance with ICAO's policies, practices, procedures and rules and subject to all necessary funds having been made available to ICAO."		Proposed for inclusion to LEB	Agreed
MSA	1.8	Singapore	"ICAO shall, on behalf of the Participating States, contract for inputs required for the provision of the Services specified in the Annex(es) to this Agreement. The recruitment of personnel and the signature of contracts shall be subject to prior approval by the CRV Task Force.		Not proposed to LEB, as the CRV task Force proposed it for deletion	
MSA	2.4	Singapore	Add "and shall not be obliged …." "ICAO shall not be obliged to begin or continue the provision of the Services and shall not be obliged to pay or commit any sums until the payments mentioned in paragraphs 2.2 and 2.6 of this Agreement have been received and ICAO shall not be obliged to pay or commit any sums exceeding the funds deposited in the aforementioned account."		Ok, no change has been done as required.	
MSA	3.1 to 3.1.4	Singapore	"3.1 ICAO shall acquire, at the request and on behalf of the Participating States and in conformity with this Agreement and ICAO's Procurement Code, the necessary equipment and supplies services described in the Annex(es) to this Agreement or requested directly from the Participating States CRV Task Force through an official communication to ICAO otherwise agreed by the Parties 3.1.2 The Participating States shall be responsible for the custom clearance process. Should the costs resulting from tariff duties, taxes or similar fees directly related to the release from customs of the equipment and supplies not be subject to exemption by the Government, the Participating States shall be responsible for defraying such costs using funds not proceeding from those specified in the Annexes."			
Annex 1	Annex 1-5 Appendix B	Singapore	This Appendix only shows the estimated cost, which could be in general form. What do miscellaneous cost cover and what are the unit rates of each of these items? However, the MSA does not state clearly how the actual payable cost will be computed. It is necessary to state clearly what are the miscellaneous items that will be payable by participating States/ANSPs and how much (unit rates) does each of these items cost. (ie travelling cost incurred by the Project Personnel, which class of travel is he/she will travel on? Business or Economy?). If they are charged at cost, it should be stated so	Miscellaneous costs: this is a standard budget line included in all of our project budgets, which may comprise of (but not limited to) UN common costs, security costs, insurance, communication costs, courier, bank charges, and third party transaction costs (i.e. UNDP). Invoice: there will be a single invoice for each participating State with 100% of its proportionate share indicated.	Unit is USD. UN rules apply on travels (business class required ona leg if a leg is longer than 9 hours).	
MSA	2.1	Singapore	Both the Service and Administrative Charges are not clearly shown in Appendix B. Do Service Charges refer to only the Project Personnel cost, while Administrative Charges refer to only the miscellaneous cost?	Administrative Charges refer specifically to ICAO overhead (i.e. 8?54A OVERHEAD CHARGES in the budget). Services refer to the actual services ICAO provides in a project (i.e. the rest of the budget).		
MSA	3.1.2	Singapore	How do we know the quantum of the Administrative Charges associated with the issuance of the original Purchase Order/Contract? If this sum is unknown now, then how to ensure that it does not change?	POs are charged an overhead based on established rate (e.g. CAPS rate). However, in this case, since ICAO will not be issuing the PO (unless there has been some change in decision TCB is not aware of), there will be no overhead against a PO. The text is standard in all our MSAs, in the case that a project would request ICAO to issue the PO.		
MSA	4.1	Singapore	Who will decide which arbitrator to be engaged?	This is a question for LEB.		
Annex 1		Singapore	The terms "RT" (Registered Tenderer?) in Annex 1, "TSS" and "w/m" (working month ?) in Appendix B, and "w/d" (working day?) in Appendix C are not defined.	TSS= technical support service; w/m = work months; w/d=work day	RT has been explicited (Registered tenderer, indeed).	
Annex 1		Singapore	"All parties commit to complying with the Management Service Agreement and have appointed the Chairman of the CRV Task Force to sign the MSA and associated Annex 1 of the Project Document on their behalf." CAAS' comments: This is not in line with the MSA and the Annex 1, which require each participating State/ANSP to sign. We prefer each participating State/ANSP to sign.		Ok, deleted	
Annex 1		Singapore	Inconsistent calculation of working days/months. CAAS' comments: • the quantity (w/m) of the Project Personnel is 2 (2 months?) here, while the Appendix C shows a duration of 67 w/d is required; o Duration: o 58 days at Home and 9 in Bangkok (3 missions to Bangkok of 3 w/d each) • The unit rate of each item and the estimated quantity of each miscellaneous item are not stated here. In this case, how do participating States/ANSPs know whether the estimated cost has been exceeded and how to compute the additional cost when the estimated cost is exceeded?	This is a mathematical formula which translates w/d into w/m. ICAO budgets are always presented in months; however job descriptions may present duration in days, when appropriate, as is this case.		
Annex 1		Singapore	Appendix C, Organisational Setting: "It is conducted by the CRV Project Management team composed of the CRV Task Force chairman in coordination and the ICAO APAC CNS Officer. The ICAO TCB is in charge of facilitating the procurement process." CAAS' comments: Is the CRV Project Management team comprises only two persons, viz. the CRV Task Force Chairman and the ICAO APAC CNS Officer?		Yes, unless there is an improvement you would suggest. "In coordination" has been deleted.	
Annex 1	Header	Thailand	Typo 'APPENDIX' to be 'APPENDIX'		Done	
Annex 1	Background: 2	Thailand	Propose to add 'a unit under ICAO,' before 'ICAO Technical...' to emphasize that this agreement will be signed by ICAO and State/Administration not ICAO TCB and State/Administration		Done, included "All Parties jointly agree to appoint ICAO through its Technical Cooperation Bureau."	
Annex 1	Background: 3	Thailand	Propose to delete 'through the establishment of an Operational Oversight Group (OOG) of the CRV network.' in order to reduce confusion with non-related parties. We also propose to delete/reduce the reference of other activities beyond the scope of this MSA and Annex 1 because we consider it irrelevant to the MSA and Annex 1.		Done	
Annex 1	Services to be provided 1 - Consultation & RFP Response 2nd bullet	Thailand	Propose to replace 'RT' with 'Registered Tender (RT)' in order to clarify the acronym 'RT'.		Done	
Annex 1	Risk Assessment Other Risk Factors	Thailand	Propose to delete this 'Other Risk Factors' section. We consider this section irrelevant to the MSA and Annex 1 because the signing of DoA will be performed after activities of MSA.		OK, Keep Other Risk Factors for the future but deleted the content that is relevant for stage 2 only	
Annex 1	Project Plan (CRV Planning)	Thailand	Propose to provide partial project plan, only items related to TCB activities and milestones, etc. We consider the details in Annex 1 should be consistant and should only mention relevant information.		The planning as is gives contextual information to ICAO TCB also, so it is considered preferable to keep the whole project plan.	
MSA	Item e DISPUTES RESOLUTION (SETTLEMENT OF DISPUTES)	Thailand	Propose to remove the clause ", if unsuccessful, such dispute, controversy or claim shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules, as in force at the time of arbitration…"		Comment inserted into the draft MSA 26 July 2014 "Some States would like this clause to be deleted if possible." for consideration by LEB.	This provision is mandatory. It could not be removed, considering that Parties are able to fall back on arbitration to conclusively resolve any dispute should they fail to resolve it amicably.
MSA	Title	ICAO Legal Bureau				Changed to "BETWEEN THE INTERNATIONAL CIVIL AVIATION ORGANIZATION AND THE CIVIL AVIATION AUTHORITIES AND/OR RELATED AIR NAVIGATION SERVICE PROVIDERS's (ANSPs) OF THE PARTICIPATING STATES REGARDING THE ESTABLISHMENT AND IMPLEMENTATION OF A COMMON REGIONAL VIRTUAL PRIVATE NETWORK "
MSA	Preamble	ICAO Legal Bureau				Hereinafter referred to individually as "Party" and collectively to as the "Parties
MSA	3.1.2	ICAO Legal Bureau				Addition of "by the Participating States "
MSA	3.1.3	ICAO Legal Bureau				Change the verb "change" to "decrease" in " An amendment to a Purchase Order/Contract shall not change decrease the Administrative Charges associated with the issuance of the original Purchase Order/Contract."decrease
MSA	5.1.2	ICAO Legal Bureau				Addition of "The Participating States shall indemnify, hold harmless and, in consultation with ICAO, defend ICAO, including its personnel from any and all actions, claims or other demands arising out of any act performed by ICAO on behalf of the Participating States pursuant to this Agreement. The obligation under this clause does not lapse upon termination or completion of this Agreement."
MSA	7.1	ICAO Legal Bureau				Modified to "This Agreement shall come into force for each Party on the date on which it ishas been signed by its representativethe parties"
MSA	7.3	ICAO Legal Bureau				Modified to "The Participation of any party in thisThis Agreement may be terminated at any time, by either Party, giving to the other a sixty (60) calendar days written notification to the other parties. The withdrawal of a Party from this Agreement shall not affect obligations already accruing to it and such Party shall take all necessary steps to ensure the settlement of its obligations. This Agreement shall terminate sixty (60) calendar days after receipt of the notification."
MSA	End	ICAO RO			Change the signing to "Agreed on behalf of the Participating State:" A contract will be issued to States/Administrations in parallel no there should not be a list of Participing States included to avoid referring back the MSA to ICAO HQ if more or less States than expected sign in. States that sign the MSA will become Participating States.	
Annex 1	Budget and Appendix A	ICAO RO			Deleted Appendix A: A contract will be issued to States/Administrations in parallel no there should not be a list of Participing States included to avoid referring back the MSA to ICAO HQ if more or less States than expected sign in. States that sign the MSA will become Participating States	
Annex 1	Estimated start date	ICAO RO			deleted "with informal coordination needed upfront"	
Annex 1	Project Plan (CRV planning)	ICAO RO			Refer to September 2014 baseline	

MANAGEMENT SERVICE AGREEMENT

BETWEEN
THE INTERNATIONAL CIVIL AVIATION ORGANIZATION
AND
THE CIVIL AVIATION AUTHORITIES AND/OR RELATED AIR NAVIGATION SERVICE PROVIDERS~~'s (ANSPs)~~ OF THE PARTICIPATING STATES
REGARDING THE ESTABLISHMENT AND IMPLEMENTATION OF A COMMON REGIONAL VIRTUAL PRIVATE NETWORK

The CIVIL AVIATION AUTHORITIES AND/OR RELATED AIR NAVIGATION SERVICE PROVIDERS (ANSPs), hereinafter referred to as the "*Participating States"*, represented by their respective authorities and

The International Civil Aviation Organization, hereinafter referred to as "ICAO", represented by the Secretary General;

Hereinafter referred to individually as "Party" and collectively ~~to~~ as the "Parties";

AGREE ON THE FOLLOWING:

1. GENERAL PROVISIONS

1.1 The Parties agree to enter into an agreement regarding management and other support services to be provided by or through ICAO, as specified in this Management Service Agreement (hereinafter referred to as "this Agreement").

1.2 A detailed description of the Project(s) in relation to which specific Services are going to be provided will be set out in and designated as Annex(es) to this Agreement.

1.3 Services to be provided by or through ICAO under this Agreement in response to requests submitted by the *Participating States* shall be furnished under the direction of the Director, Technical Co-operation Bureau of ICAO on behalf of the *Participating States*. Nevertheless, the *Participating States* shall retain overall responsibility for the implementation of the Project(s).

1.4 The services shall be approved by ICAO and shall be specified in the Annex(es) to this Agreement and subsequent variations (hereinafter referred to as "the Services"). Such Services shall be provided in accordance with ICAO's policies, practices, procedures and rules and subject to all necessary funds having been made available to ICAO.

1.5 The specific responsibilities of the Parties with regard to the contribution for the implementation of Project(s) shall be outlined as inputs in the Annex(es) to this Agreement.

1.6 ICAO and the *Participating States* shall maintain close consultations respecting all aspects of the provision of the Services contemplated under this Agreement.

1.7 Any change to the duration of the Agreement and/or the scope of the Project(s) shall require negotiations between the Parties and the changes to the Agreement shall be made in accordance with 7.2.

1.8 ICAO shall, on behalf of the *Participating States*, contract for inputs required for the provision of the Services specified in the Annex(es) to this Agreement.

1.9 In the performance of the duties the personnel or contractors shall collaborate closely with officials of the *Participating States* and shall help to execute the Project(s) in conformity with such general guidelines as the *Participating States* may establish in consultation with ICAO. The latter shall furnish to the above-mentioned personnel or contractors whatever guidance ICAO deems necessary for the successful implementation of the Services.

1.10 Unless agreed otherwise by the *Participating States* and ICAO in the Annex(es) to this Agreement, the *Participating States* shall be solely responsible, using funds other than those specified in the Annex(es), for the recruiting of local personnel and payment of their salaries and benefits, as well as for the administrative support (local secretarial and personal services, offices, locally produced equipment and supplies, transportation within the country, and communications) required for the execution of the Project(s) and the provision of the Services and related support.

1.11 The funds and activities under this Agreement shall be administered according to applicable ICAO regulations, rules, directives, procedures and practices.

1.12 The obligations assumed by the parties under this Agreement shall continue to exist after termination of this Agreement to the extent necessary to permit the orderly finalization of activities, the withdrawal of personnel, the distribution of funds and assets, the liquidation of accounts existing between the parties, and the settlement of contractual obligations. Additional funds, if necessary, to cover the above-mentioned expenditures shall be provided by the *Participating States*.

2. FINANCING PROVISIONS

2.1 The estimated total cost of the Services will be indicated in the Annex(es) to this Agreement. For management of the Services, ICAO shall be paid Administrative Charges as indicated in the Annex(es). The total cost (Services and Administrative Charges) of the Project(s) shall not exceed the amount reflected in the Annex(es) without the prior agreement of the *Participating States*.

2.2 Upon signature of the Annex(es), the *Participating States* shall deposit the amounts detailed in the Annex(es) to cover the estimated cost of the Services and Administrative Charges.

2.3 All cash receipts to, and payments made by, ICAO under this Agreement shall be recorded in a separate account, opened, *inter alia*, in order to place on record the receipt and administration of payments. All payments made to ICAO shall be made in U.S. dollars and deposited in ICAO's bank account as follows:

Pay to:	//CC000305101 Royal Bank of Canada Ste. Catherine and Stanley Branch 1140 Ste. Catherine Street West Montreal, Quebec Canada H3B 1H7
For credit to:	05101 404 6 892 Project: Common Regional Virtual Private Network (CRV). ICAO Pool Account
Swift code:	ROYCCAT2

2.4 ICAO shall not be obliged to begin or continue the provision of the Services until the payments mentioned in paragraphs 2.1 and 2.7 of this Agreement have been received and ICAO shall not be obliged to pay or commit any sums exceeding the funds deposited in the aforementioned account.

2.5 ICAO shall furnish the *Participating States* with unaudited financial statements concerning the Services covered in this Agreement, showing the status of the funds in U.S. dollars as at the end of March, June, September and December. After ICAO has concluded the provision of the Services, it shall submit to the *Participating States* a final financial statement. In the event that a *Participating State~~s~~* request that a special audit/evaluation of its account or project under this Agreement be performed by the Internal or External Auditor of ICAO, the requesting *State~~s~~* shall bear the cost of such audit.

2.6 If due to unforeseen circumstances the funds received under this Agreement should prove insufficient to cover the total cost of provision of the Services and Administrative Charges, ICAO shall inform the *Participating States* to that effect and additional funds, if required, shall be made available to ICAO before the continuation of the project.

2.7 Any balance of funds not disbursed and not committed at the conclusion of the Services shall be returned to the *Participating States* on request, or be retained in the account for future use to be defined by the *Participating States*.

2 PROCUREMENT SERVICES PROVISIONS

3.1. ICAO shall acquire, at the request and on behalf of the *Participating States* and in conformity with this Agreement and ICAO's Procurement Code, the necessary services described in the Annex(es) to this Agreement or requested directly from the *Participating States* through an official communication to ICAO~~:~~.

3.1.1. The *Participating States* shall be responsible for the custom clearance process. Should the costs resulting from tariff duties, taxes or similar fees directly related to the release from customs of the equipment and supplies not be subject to exemption by the Government, the *Participating States* shall be responsible for defraying such costs using funds not proceeding from those specified in the Annexes.

3.1.2. The Administrative Charge fees will be phased according to the degree of advancement of the procurement process (20% at the issuance of the tender, additional 30% when the evaluation process has been completed and the balance upon signature of the purchase order/contract). Should an on-going Purchase Requisition approved by the *Participating States* be cancelled by the *Participating States* before the purchase is effected, ICAO shall be entitled to recover its costs based on the amount of work that has been completed in the implementation of the said Purchase Requisition. ICAO will invoice the corresponding amount to the *Participating States*.

3.1.3. An amendment to a Purchase Order/Contract shall not ~~change~~ decrease the Administrative Charges associated with the issuance of the original Purchase Order/Contract.

3 DISPUTES RESOLUTION (SETTLEMENT OF DISPUTES)

4.1 Any dispute, controversy or claim arising out of or relating to this Agreement, or the breach, termination or invalidity thereof, shall be settled, in the first instance, by direct negotiations between the parties concerned. If unsuccessful, such dispute, controversy or claim shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules, as in force at the time of arbitration. The place of arbitration shall be Montreal, Province of Quebec, Canada, conducted in the English language. Arbitration shall be conducted by one arbitrator. The arbitral award shall contain a statement of reasons on which it is based and shall be accepted by the Parties as the final adjudication of the dispute.

4 ICAO PRIVILEGES AND IMMUNITIES

5.1 Nothing in or relating to this Agreement shall be deemed a waiver, express or implied, of any immunity from suit or legal process or any privilege, exemption or other immunity enjoyed or which may be enjoyed by ICAO, its officers, staff, assets and funds either pursuant to the *Convention on the Privileges and Immunities of the Specialized Agencies, 1947* or other applicable conventions, agreements, laws or decrees.

5.2 The *Participating States* shall indemnify, hold harmless and, in consultation with ICAO, defend ICAO, including its personnel from any and all actions, claims or other demands arising out of any act performed by ICAO on behalf of the *Participating States* pursuant to this Agreement. The obligation under this clause does not lapse upon termination or completion of this Agreement.

5 CORRESPONDENCE

6.1 All correspondence relating to the implementation of this Agreement other than this signed Agreement or the amendments thereto, shall be addressed to:

- **For ICAO:**

Regional Director
Asia and Pacific Office
P.O. Box 11, Samyaek Ladprao
Bangkok 10901
Thailand

- For the Participant States: to the signatories of this MSA.

6.2 The *Participating States* shall keep ICAO duly informed of all measures which it adopts for the fulfilment of this Agreement or which may affect this Agreement.

6 ENTRY INTO FORCE, AMENDMENTS AND TERMINATION

7.1 This Agreement shall come into force for each Party on the date on which it is~~has been~~ signed by its representative~~the parties~~. It shall continue to be in force until terminated under paragraph 7.3. Upon coming into force, it shall supersede existing Agreements concluded between the parties on the same subject matter.

7.2 This Agreement may be amended at any time by written agreement between the parties. This Agreement shall not be varied, modified or supplemented by the Parties in any manner, except in writing signed on behalf of each of the Parties by a duly authorised officer or representative. Any request for a variation, modification or supplement to this Agreement shall be submitted for review by the requesting Party and shall be agreed by all Parties. A variation shall be agreed between the Parties to reflect the outcome of the negotiations.

7.3 The Participation of any party in this~~This~~ Agreement may be terminated ~~at any time,~~ by ~~either Party,~~ giving ~~to the other a~~ sixty (60) calendar days written notification to the other parties. The withdrawal of a Party from this Agreement shall not affect obligations already accruing to it and such Party shall take all necessary steps to ensure the settlement of its obligations. ~~This Agreement shall terminate sixty (60) calendar days after receipt of the notification.~~

Agreed on behalf of the International Civil Aviation Organization:

Signed by: _____

Name: _____

Title: _____

Date: _____

Agreed on behalf of the *Participating State*:

For _____ (State/Administration)

_____

Name: _____

Title: _____

Date: _____

– END –

ANNEX 1

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ANNEX 1 TO THE MANAGEMENT SERVICE AGREEMENT BETWEEN
THE INTERNATIONAL CIVIL AVIATION ORGANIZATION AND
THE CIVIL AVIATION AUTHORITIES AND/OR RELATED AIR NAVIGATION SERVICE PROVIDERS AS LISTED IN APPENDIX A

Project Title:	Common Regional Virtual Private Network (CRV) multinational service with a common service provider
Project No.:	RAS/14/801
Initial duration:	01 June 2015. – 31 November 2016
Sector and Sub-Sector:	Transport and Civil Aviation
Country Implementing Agency:	Civil Aviation Authorities and/or related ANSPs
Executing Agency:	International Civil Aviation Organization (ICAO)
Location:	Asia Pacific
Estimated Start Date:	June 2015~~, with informal coordination needed upfront~~
Estimated Project Cost:	US$ 109,300

Brief Description: ICAO will assist the Civil Aviation Authorities and/or related ANSPs in the procurement management (i.e. Stage 1) of the APAC CRV Project and in the selection of a common service provider. The ICAO assistance covers the specific work scope outlined in this project document.

Signed on behalf of:	**Signature**	**Name/Title**	**Date**
International Civil Aviation Organization	_____	Raymond Benjamin Secretary General	_____

~~CRV Pioneer~~
~~State/Administration~~

Entity:

Title:

Civil Aviation Authorities/ANSPs

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Background:

1. The Civil Aviation Authorities and/or related ANSPs as listed in Appendix A, hereinafter collectively referred to as the "Parties" and individually as the "Party", have determined that the Common Regional Virtual Private Network (CRV) multinational service with a common service provider can more effectively:
   - provide network services to the Parties;
   - support a common Internet Protocol (IP) network;
   - establish services based on Voice over IP (VoIP); and
   - enhance network diversity and timely service implementation and delivery.

2. All Parties jointly agree to appoint ICAO through its Technical Cooperation Bureau (TCB) to assist in the procurement management (i.e. Stage 1) of the CRV project and in the selection of the common Service Provider. Upon selection of the common service provider after a Sealed Tender (ST) process through TCB, a Party shall subscribe to the Services by signing an individual Service Contract with the Service Provider for the procurement, installation, training, testing, commissioning and operation of the CRV network and the associated services.

Services to be provided:

1. Through this Annex to the above-mentioned Management Service Agreement, the following services will be provided by ICAO:

   - Tender Preparation Stage
   - Review the technical specifications provided by the CRV Task Force with the aim to have SMART (Simple, Measurable, Assignable, Realistic and Time-related) and consolidated requirements;
   - Develop the evaluation criteria for CRV Task Force consideration and finalization;
   - Prepare tender documents including integrating the technical specifications, and any other information required in the tender documents.

   - TCB Publication of Sealed Tender

- Investigate market and propose and identify suitable suppliers to register with ICAO, including those having participated in the Request For Information (RFI), which is handled by the ICAO APAC Regional Office;
- Advertise Sealed Tender (ST) on ICAO's tendering website and notify the appropriate suppliers.

  - Consultation & RFP Response
- Coordinate any site survey needed by RT (Registered Tenderers), as appropriate;
- Handle all the tender clarifications including consultation with the CRV Task Force, organization of tender clarification meetings (by telephone, webconference, etc), and fair dissemination of information to all RT;
- Optionally, to set up a Face to Face meeting with RT to exhaust questions before submission of responses.

  - Selection
- Receive tender responses at ICAO's tendering website, carry out a pre-evaluation, and provide support to the CRV Tender Evaluation Committee meetings, including a final physical evaluation meeting;
- Award the tender.

  - General On-going Assistance
- Participate as a technical advisor to the CRV Task Force ;
- Any other related services.

Budget:

The detailed budget is as attached at Appendix B.

1. Funds will be equally shared among the Civil Aviation Authorities and/or related ANSPs as listed in Appendix A, and provided by them in advance of commencement of the project.
2. The total estimated amount is of US$ 109,300 as per Appendix B. This amount is the total estimated amount including administrative and technical support.

Risk Assessment

Initial Major Risk Factor

1.1 Delay in the signing of this project document and remittance of funds.

Risk Level: Medium

Mitigation: ICAO will work through the Chairman of the CRV Task Force with the Civil Aviation Authorities and/or related ANSPs to facilitate the signing of the project document and the remittance of required funds.

Other Risk Factors

1.2 None

Project Plan (CRV planning):

The CRV Project planning as per ~~May~~ September 2014 is attached at Appendix D.

Appendix A

PARTIES TO THIS MSA (FOR STAGE 1)

The Civil Aviation Authorities, related Organizations of the Governments such as Air Navigation Service Providers, Organizations representing States and/or act on behalf of States) as listed below, agree to be parties of the aforementioned MSA. All parties commit to complying with the Management Service Agreement by signing the MSA and associated Annex 1 of the Project Document.

- Australia
- Fiji
- France (the project covers French Polynesia, New Caledonia, and Wallis and Futuna islands)
- Hong Kong China
- India
- Japan
- Malaysia
- New Zealand
- Philippines
- Singapore
- Thailand
- United States of America (USA) (the project covers American Samoa, Guam, Johnston Island, Kingman Reef, Midway, Northern Mariana Islands, Palmyra, Wake Island)

~~NOTE: This list will be finalized on 14 November 2014 at the latest.~~

Appendix B

PROJECT BUDGET COVERING MSA CONTRIBUTION
(IN UNITED STATES DOLLARS)

COUNTRY: REGIONAL PROJECT
PROJECT NO: RAS14801
PROJECT TITLE: ASSISTANCE WITH THE PROCUREMENT OF A CRV (COMMON REGIONAL V
WORK ORDER: RAS14801-01

	TOTAL		**2015**	
	w/m	$	**w/m**	$
PROJECT PERSONNEL				
INTERNATIONAL PROFESSIONAL POSTS				
B554A CONSULTANTS FOR TSS	2.0	81 800	2.0	81 800
SUB-TOTAL (INTERNATIONAL PROFESSIONAL POSTS)	2.0	81 800	2.0	81 800
TOTAL (PROJECT PERSONNEL)		81 800		81 800
MISCELLANEOUS				
B807L REPORTING COSTS		5 000		5 000
B807M MISCELLANEOUS EXPENSES		4 300		4 300
B754A OVERHEAD CHARGES		18 200		18 200
TOTAL (MISCELLANEOUS)		27 500		27 500
PROJECT TOTAL		109 300		109 300

Appendix C

International Civil Aviation Organization
Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Communications expert	Position Number (ID):	
Specific Title:	Aeronautical communications procurement expert	Skill Code: (By FRU)	
Project Number:		Post Number/Job Code:	
Duty Station:	Home and Bangkok	Classification Level: (By FRU)	
Duration:	58 days at Home and 9 in Bangkok (3 missions to Bangkok of 3 w/d each)		
Starting Date:	June 2015		

ORGANISATIONAL SETTING

The Technical Cooperation Bureau (TCB) of ICAO is responsible for planning, development, implementation, and evaluation of the ICAO Technical Co-operation Programme. TCB provides assistance in identifying priority development needs of the civil aviation sector and provides technical cooperation to the receiving States. The Field Operations Section (FOS) implements projects and programmes in accordance with the policies and practices of TCB.

The objective of the CRV project (Common Regional Virtual Private Network) is to build the Asia Pacific aeronautical network that will carry aeronautical data and voice communications between the States of this region from end of 2016 onwards, and that will also be connected to other regional networks as needed and practicable. The project consists in procuring a service of transportation (and not equipment) through a virtual network provided by a Telecommunication Service Provider.

The CRV project constitutes a follow-up to the decision 24/32 made by APANPIRG in June 2013 that a Task Force with Subject Matter Experts be established to study the virtual private network and develop a detailed proposal by 2016. It is conducted by the CRV Project management team composed of the CRV Task Force chairman ~~in coordination~~ and the ICAO APAC CNS Officer. The ICAO TCB is in charge of facilitating the procurement process.

IMPACT OF OUTCOME OF THE POSITION

Selection of a single Communication Service Provider (CSP) for the CRV network in APAC region.

MAJOR DUTIES AND RESPONSIBILITIES

Under the supervision of the Director, Technical Cooperation Bureau, the consultant will:

1. Main Tasks:

    1. Review all documentation developed for this project in order to understand the Concept of Operations developed for CRV
    2. Review the user requirements (general, technical and process) provided by the CRV Task Force with the aim to have consolidated requirements;
    3. Develop the evaluation criteria for CRV Task Force consideration and finalization;
    4. Assist TCB, if required, to handle the tender technical clarifications including consultation with the CRV Task Force,
    5. If needed, participate in a Face to Face meeting with Registered Tenderers to exhaust questions before submission of responses;

6. Carry out a pre-evaluation, and provide support to the CRV Tender Evaluation Committee meetings, including a final physical evaluation meeting;
7. Participate as a technical advisor to the CRV Task Force for tender preparation and evaluation.
8. Perform any other task related to the points mentioned above, as required.

Specifically, On-Site work at ICAO Regional Office facilities in Bangkok, Thailand, will consist in the following tasks:

- Provide technical support for the review of CRV user requirements with APAC States as appropriate;
- Provide technical and Secretariat support to the Face to Face meeting with Registered Tenderers and some APAC States to clarify the project technical requirements before submission of responses; and
- Provide technical support to the final CRV Tender Evaluation Committee meeting.

2. Deliverables include:

a) A consolidated List of CRV validated user requirements (general, technical and process);
b) Draft evaluation criteria for CRV Task Force consideration;
c) Provide technical support for clarifications requested by the Registered Tenderers,
d) A pre-evaluation of the proposals from Tenderers;
e) A final evaluation of the proposals from Tenderers including recommendation of the winner; and
f) A summary report of the procurement process.

3. Reporting duties:

a) Prepare and submit Periodic Progress and Final Reports to CRV Project Management Team and TCB, in accordance to the approved project Work Plan Report. Participate in periodic teleconferences CRV Project Management Team and TCB, as appropriate.

4. Coordination duties:

a) Coordinate with ICAO TCB and CRV Project management team, the preparation of the Work Plan, and submission of the Work Plan report within 5 working days of start of assignment.

b) Act as focal point liaising with CRV Project management team, TCB, and other stakeholders as appropriate.

c) Perform any other project management/coordination duties as required.

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree in Telecommunications Engineering or Equivalent acceptable academic and technical qualifications

Professional experience and knowledge

Minimum 10 years of professional experience with aeronautical telecommunications
Minimum 5 years of professional experience in the preparation of specifications, negotiations and acquisition of aeronautical telecommunications services
Minimum 5 years of professional experience in the Planning, installation, operation and maintenance of aeronautical telecommunications facilities
Experience in safety cases related to Air Traffic Services
In-depth experience with review of tender documentation and recommendation for selection of suppliers
In-depth Knowledge of related ICAO SARPS regarding Aeronautical Fixed Services, fault/configuration/safety/security management of communications networks, typical designs for IP networks, Voice over IP

Language Skills

1. Expert must to be fluent in English (both written and verbal).

Competencies

1. Judgment/decision–making: Proven ability to take ownership of all responsibilities and to honour commitments, to exercise mature and fair judgment, to recognize key issues and analyse relevant information, to make feasible recommendations and to make sound decisions.

2. Communication: Ability to write clearly and concisely and to present articulate verbal reports.

3. Teamwork: Ability to work with colleagues to achieve the project goals and maintain harmonious working relationships in a multinational environment.

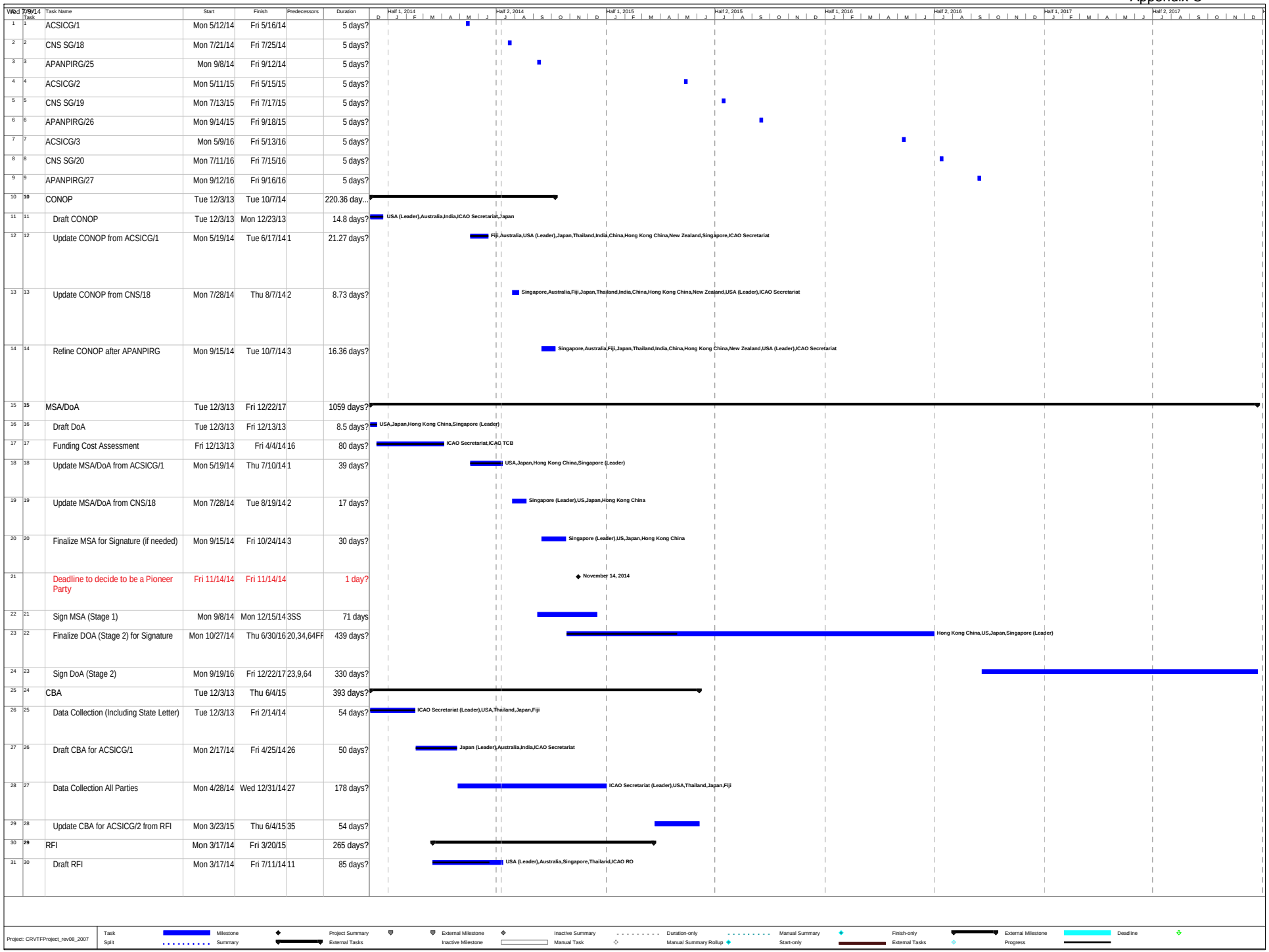
4. Client Orientation: Ability to establish and maintain partnerships with external collaborators, to work and advocate effectively in a consensus-based system and to successfully manage and resolve conflict.

5. Commitment to continuous learning: Willingness to keep abreast of new developments in professional field.

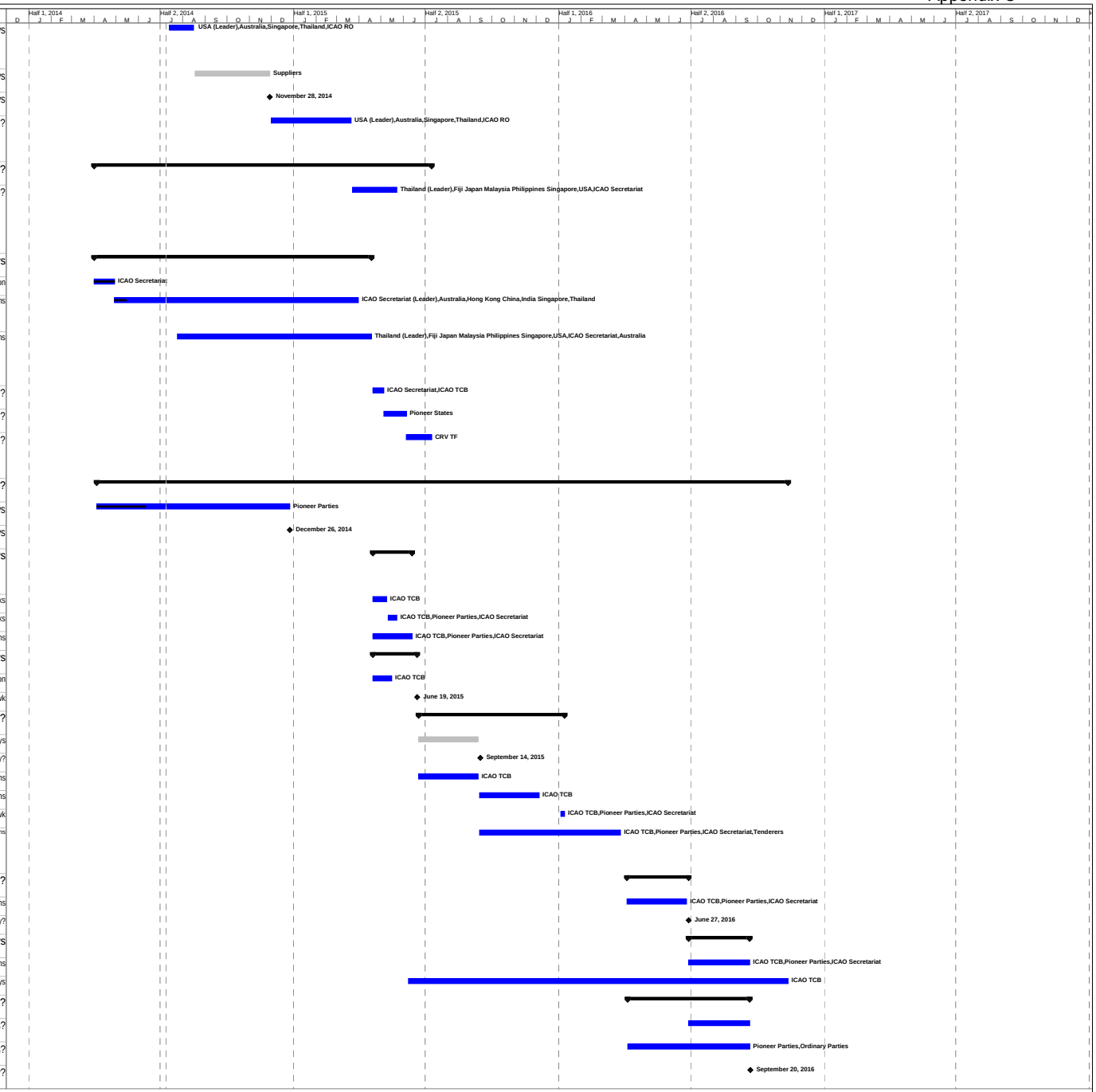
6. Technological awareness: Ability to use contemporary office automation equipment, software, databases.

SALARY

TBD by FPS/FRU


Wed 7/9/14
Task Name
Start
Finish
Predecessors
Duration
Half 1, 2014
Half 2, 2014
Half 1, 2015
Half 2, 2015
Half 1, 2016
Half 2, 2016
Half 1, 2017
Half 2, 2017
1 ACSICG/1 Mon 5/12/14 Fri 5/16/14 5 days?
2 CNS SG/18 Mon 7/21/14 Fri 7/25/14 5 days?
3 APANPIRG/25 Mon 9/8/14 Fri 9/12/14 5 days?
4 ACSICG/2 Mon 5/11/15 Fri 5/15/15 5 days?
5 CNS SG/19 Mon 7/13/15 Fri 7/17/15 5 days?
6 APANPIRG/26 Mon 9/14/15 Fri 9/18/15 5 days?
7 ACSICG/3 Mon 5/9/16 Fri 5/13/16 5 days?
8 CNS SG/20 Mon 7/11/16 Fri 7/15/16 5 days?
9 APANPIRG/27 Mon 9/12/16 Fri 9/16/16 5 days?
10 CONOP Tue 12/3/13 Tue 10/7/14 220.36 day...
11 Draft CONOP Tue 12/3/13 Mon 12/23/13 14.8 days?
USA (Leader),Australia,India,ICAO Secretariat,Japan
12 Update CONOP from ACSICG/1 Mon 5/19/14 Tue 6/17/14 1 21.27 days?
Fiji,Australia,USA (Leader),Japan,Thailand,India,China,Hong Kong China,New Zealand,Singapore,ICAO Secretariat
13 Update CONOP from CNS/18 Mon 7/28/14 Thu 8/7/14 2 8.73 days?
Singapore,Australia,Fiji,Japan,Thailand,India,China,Hong Kong China,New Zealand,USA (Leader),ICAO Secretariat
14 Refine CONOP after APANPIRG Mon 9/15/14 Tue 10/7/14 3 16.36 days?
Singapore,Australia,Fiji,Japan,Thailand,India,China,Hong Kong China,New Zealand,USA (Leader),ICAO Secretariat
15 MSA/DoA Tue 12/3/13 Fri 12/22/17 1059 days?
16 Draft DoA Tue 12/3/13 Fri 12/13/13 8.5 days?
USA,Japan,Hong Kong China,Singapore (Leader)
17 Funding Cost Assessment Fri 12/13/13 Fri 4/4/14 16 80 days?
ICAO Secretariat,ICAO TCB
18 Update MSA/DoA from ACSICG/1 Mon 5/19/14 Thu 7/10/14 1 39 days?
USA,Japan,Hong Kong China,Singapore (Leader)
19 Update MSA/DoA from CNS/18 Mon 7/28/14 Tue 8/19/14 2 17 days?
Singapore (Leader),US,Japan,Hong Kong China
20 Finalize MSA for Signature (if needed) Mon 9/15/14 Fri 10/24/14 3 30 days?
Singapore (Leader),US,Japan,Hong Kong China
21 Deadline to decide to be a Pioneer Party Fri 11/14/14 Fri 11/14/14 1 day?
November 14, 2014
22 Sign MSA (Stage 1) Mon 9/8/14 Mon 12/15/14 3SS 71 days
23 Finalize DOA (Stage 2) for Signature Mon 10/27/14 Thu 6/30/16 20,34,64FF 439 days?
Hong Kong China,US,Japan,Singapore (Leader)
24 Sign DoA (Stage 2) Mon 9/19/16 Fri 12/22/17 23,9,64 330 days?
25 CBA Tue 12/3/13 Thu 6/4/15 393 days?
26 Data Collection (Including State Letter) Tue 12/3/13 Fri 2/14/14 54 days?
ICAO Secretariat (Leader),USA,Thailand,Japan,Fiji
27 Draft CBA for ACSICG/1 Mon 2/17/14 Fri 4/25/14 26 50 days?
Japan (Leader),Australia,India,ICAO Secretariat
28 Data Collection All Parties Mon 4/28/14 Wed 12/31/14 27 178 days?
ICAO Secretariat (Leader),USA,Thailand,Japan,Fiji
29 Update CBA for ACSICG/2 from RFI Mon 3/23/15 Thu 6/4/15 35 54 days?
30 RFI Mon 3/17/14 Fri 3/20/15 265 days?
31 Draft RFI Mon 3/17/14 Fri 7/11/14 11 85 days?
USA (Leader),Australia,Singapore,Thailand,ICAO RO
Project: CRVTFProject_rev08_2007
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Progress
Deadline

Wed 7/9/14	Task	Task Name	Start	Finish	Predecessors	Duration
32	31	Release of RFI	Mon 7/14/14	Fri 8/15/14	31	25 days
33	32	Waiting Response	Mon 8/18/14	Fri 11/28/14	32	75 days
34	33	RFI Close	Fri 11/28/14	Fri 11/28/14	33	0 days
35	34	Review and Process RFI	Mon 12/1/14	Fri 3/20/15	34,1,27	80 days?
36	**35**	RFP	Tue 4/1/14	Thu 7/9/15		333 days?
37	36	Gather State Information	Mon 3/23/15	Fri 5/22/15	14,35	45 days?
38	**37**	Generate Requirements	Tue 4/1/14	Fri 4/17/15		274 days
39	37-a	Make User Requirement Template	Tue 4/1/14	Mon 4/28/14		1 mon
40	37-b	Make Safety Preliminary analysis	Tue 4/29/14	Mon 3/30/15	39	12 mons
41	37-c	Make user Requirements	Thu 7/24/14	Fri 4/17/15		9.56 mons
42	38	Determine Selection Process	Mon 4/20/15	Mon 5/4/15	22,41	11 days?
43	39	Determine Awarding Process	Tue 5/5/15	Thu 6/4/15	42	23 days?
44	40	Update APANPIRG/26 on Sealed Tender	Fri 6/5/15	Thu 7/9/15	43	25 days?
45	**41**	TCB Process	Fri 4/4/14	Fri 11/11/16		680.5 days?
46	42	Funding Preparation	Fri 4/4/14	Fri 12/26/14	17	190 days
47	43	Funds are ready	Fri 12/26/14	Fri 12/26/14	46	0 days
48	**44**	TCB Requirement Reviews and Packaging	Mon 4/20/15	Fri 6/12/15	22,38,47	40 days
49	44-a	(a) Review the technical specifications	Mon 4/20/15	Fri 5/8/15	41	3 wks
50	44-b	(b) Develop the evaluation criteria	Mon 5/11/15	Fri 5/22/15	49	2 wks
51	44-c	(c) Prepare tender documents	Mon 4/20/15	Fri 6/12/15		2 mons
52	**45**	TCB Publication of Sealed Tender	Mon 4/20/15	Fri 6/19/15		45 days
53	45-d	(d) Identify suitable suppliers	Mon 4/20/15	Fri 5/15/15	49SS	1 mon
54	45-e	(e) Advertise Sealed Tender (ST)	Mon 6/15/15	Fri 6/19/15	53,51	1 wk
55	**46**	Consultation & ST Response	Mon 6/22/15	Fri 1/8/16	54	145 days?
56		Wait for proposals from Tenderers	Mon 6/22/15	Fri 9/11/15	54	60 days
57		Proposals from Tenderers	Mon 9/14/15	Mon 9/14/15	56	1 day?
58	46-f	(f) Coordinate site surveys	Mon 6/22/15	Fri 9/11/15		3 mons
59	46-g	(g) Handle tender clarifications	Mon 9/14/15	Fri 12/4/15	58	3 mons
60	46-h	(h) Face to Face meeting with RT	Mon 1/4/16	Fri 1/8/16	59FS+1 mon	1 wk
61	**53**	Establish Common Provisions (including CRV design and SLA)	Mon 9/14/15	Fri 3/25/16	59SS	7 mons
62	**47**	Selection	Mon 4/4/16	Mon 6/27/16	60FS+3 m	61 days?
63	47-i	(i) Carry out a preevaluation and evaluation mee	Mon 4/4/16	Fri 6/24/16		3 mons
64	48-l	(l) Notify selection to supplier	Mon 6/27/16	Mon 6/27/16	63	1 day?
65	**49**	Contract preparation	Tue 6/28/16	Mon 9/19/16	64	60 days
66	49-k	(k) Prepare Individual Service Contract template	Tue 6/28/16	Mon 9/19/16		3 mons
67	49-j	(j) Participate as a technical advisor to the CRV Ta	Mon 6/8/15	Fri 11/11/16		375 days
68	**50**	Implementation Plan	Tue 4/5/16	Mon 9/19/16		120 days?
69	51	Draft Implementation Plan	Tue 6/28/16	Mon 9/19/16	62	3 mons?
70	52	OOG Setting Up and Staffing	Tue 4/5/16	Mon 9/19/16	69FF	6 mons?
71		Start Individual Service Contracts	Tue 9/20/16	Tue 9/20/16	66	1 day?



Project: CRVTFProject_rev08_2007

Task | Milestone | Project Summary | External Milestone | Inactive Summary | Duration-only | Manual Summary | Finish-only | External Milestone | Deadline
Split | Summary | External Tasks | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | External Tasks | Progress

What is CRV?

CRV is the future Asia-Pacific aeronautical network, the implementation of which is planned for end 2016.

It is a wholly dependable and reliable communications infrastructure for aeronautical communications in Asia Pacific and with other ICAO regions, facilitating the Global Air Navigation Plan (GANP 4th Edition) B0-FICE, B0-NOPS, VoIP and B1-SWIM modules.

CRV is now in the study phase, and its implementation is subject to a conclusion by the Asia Pacific Air Navigation Planning and Implementation Regional Group.

Initially led by a Pioneer group of States and Administrations, the intention is that the CRV network connects all Administrations over the Asia-Pacific Region.

Some **key ideas**:

The network is an Asia-Pacific-Region-wide Internet Protocol (IP) communication network.

The network is an upgrade from a current point-to-point communication infrastructure employed in APAC.

The network will utilize a private commercial network from a single Communication Service Provider.

The network will initially carry Air Traffic Service Message Handling System (AMHS) data and potentially other types of data such as voice over IP.

The network will be a fundamental foundation for the reliable and secured support of current and future ATM information services such as inter center communications, sharing of surveillance data, exchange of Air Traffic Flow Management data, System Wide Information Management (SWIM), etc.

Start of operations is planned for end 2016, if confirmed by APANPIRG

Request for Information, to the attention of Telecommunication Service Providers

Prospective service providers interested in responding to this RFI are asked to issue a written RFI Response by **03 November 2014.**

Prospective service providers willing to present their proposal on **9 December 2014** at the ICAO Asia-Pacific Regional Office located in 252/1 Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900, Thailand are

requested to issue a copy of the presentation by **28 November 2014**. Any presentation received after **28 November 2014 will not be accepted.**

RFI Responses received between **03 November** and **28 November** will be accepted, but those service providers will not be invited to present at the **9 December** meeting.

Non response to this RFI will not preclude any service providers from participating in a potential future Sealed Tender.

The Request for Information (RFI) consists of 4 documents:

- Request For Information (RFI)
- Response schedule
- Site schedule
- The CRV Concept of Operations (version 0.6), for information.

Responses to RFI

A **hard copy** response, with its corresponding **electronic version**, is requested by **17h00 (ICT) on 03 November 2014** to the attention of:

Asia Pacific CRV TF
International Civil Aviation Organization (ICAO) Asia and Pacific Office (ICAO-APAC)
252/1 Vibhavadi-Rangsit Road, Chatuchak,
Bangkok 10900, Thailand

Electronic version is to be sent to: apac@icao.int

Questions and answers

Answers to the questions by Telecommunication Service Providers that are of interest to all Telecommunication Service Providers will be posted here.

Registering for the potential future Sealed Tender

Interested Telecommunication Service providers willing to register in view of the future potential sealed tender can proceed to the ICAO Procurement portal http://cfapp.icao.int/procurement/ to register.

APANPIRG/25 - Flimsy 1
Appendix E

ASIA PACIFIC CIVIL AVIATION AUTHORITIES AND AIR NAVIGATION SERVICE PROVIDERS

Request for Information (RFI)

Asia Pacific Common Regional Virtual Private Network (CRV)

RFI INSTRUCTIONS

Dear Service Providers,

The current point-to-point circuit based telecommunications system for the Asia/Pacific region uses dated technology and is increasingly difficult to maintain and update. This Request For Information (RFI) is to solicit industry input on current technologies to replace the existing system and provide cost-effective growth in both network participants and capacity. The Asia Pacific CRV will provide interactive voice and data telecommunications services between air traffic control facilities associated with international airports in several States located in the Asia/Pacific Region.

The Asia and Pacific (APAC) Regional Office of the International Civil Aviation Organization (ICAO) on behalf of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) – Communication/Navigation/Surveillance (CNS) Sub-Group – Aeronautical Communication Service (ACS) Implementation Co-ordination Group (ACSICG) – Common Regional Virtual Private Network (VPN) Task Force (CRV TF), formal technical entity representing all the Asia Pacific member States/Organizations, is issuing the Request For Information (RFI) document.

Based on responses to this RFI, a Request for Proposal (RFP) under a tendering procurement process will be issued. ICAO in support of the CRV TF will assist the tender procurement process to select a Service Provider and negotiate the terms for a five (5) year contract with a five year option contract that will be signed between the chosen Service Provider and each host Government participating in the Asia Pacific CRV.

Prospective service providers interested in responding to this RFI are asked to issue a written RFI Response by **03 November 2014.**

Prospective service providers willing to present their proposal on **9 December 2014** at the ICAO Asia-Pacific Regional Office located in 252/1 Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900, Thailand are requested to issue a copy of the presentation by **28 November 2014**. Any presentation received after **28 November 2014 will not be accepted.**

RFI Responses received between **03 November** and **28 November** will be accepted, but those service providers will not be invited to present at the **9 December** meeting.

Non response to this RFI will not preclude any service providers from participating in a potential future Sealed Tender.

The RFI documentation is posted on the ICAO APAC Regional Office website http://www.icao.int/APAC/Pages/CRV.aspx.

Thank you for participating in this process for the modernization of the Asia Pacific communications.

Asia Pacific Common Regional VPN Task Force

Instructions to Prospective Service Providers, For Response to Request for Information (RFI), Aeronautical Fixed Services Telecommunications Network "Asia Pacific CRV"

1. This REQUEST FOR INFORMATION is addressed to telecommunication service providers that would like to participate in the modernization process for Asia Pacific air traffic control communications. Companies interested in responding to this RFI are asked to issue a written RFI Response by **17h00 (ICT) on 03 November 2014**. For those vendors expressing interest, the Asia Pacific CRV TF will provide answers to questions that are submitted by e-mail or any other communication means during the permitted time frame.

2. Responses to the RFI must be in English. A hard copy response, with its corresponding electronic version, is requested by **17h00 (ICT) on 03 November 2014** to the attention of:

   Asia Pacific CRV TF
   International Civil Aviation Organization (ICAO) Asia and Pacific Office (ICAO-APAC)
   252/1 Vibhavadi-Rangsit Road, Chatuchak,
   Bangkok 10900, Thailand

The electronic version must be sent to apac@icao.int.

3. The question/answer period regarding the Asia Pacific CRV RFI will be until **24 October 2014**. Questions must be received by email no later than **17h00 (ICT) on 17 October 2014**. All questions and answers to those questions will be posted on the Asia Pacific CRV RFI Webpage http://www.icao.int/APAC/Pages/CRV.aspx no later than **17h00 (ICT) on 24 October 2014**. The identity of the party posing questions will not be divulged to any of the other parties. Service Provider information marked Proprietary or Confidential will not be divulged to any of the other parties. All questions are to be addressed to the following email: apac@icao.int.

4. The following milestones for the Asia Pacific CRV RFI process must be considered by all interested Service Providers:

15 August 2014	Public RFI issuance for all telecommunication Service Providers
17 October 2014	Deadline to receive questions at apac@icao.int. Questions and answers to those questions will be posted on the Asia Pacific CRV RFI Webpage (http://www.icao.int/APAC/Pages/CRV.aspx) by **24 October 2014**.
03 November 2014	Deadline to receive RFI responses from service providers wishing to present at the **9 December** CRV TF session
28 November 2014	Deadline to receive the presentation for the **9 December** session to the CRV TF
28 November 2014	Deadline to receive RFI responses from service providers not wishing to present at the **9 December** CRV TF session
9 December 2014	Presentation of responses to CRV TF (duration of slot will be fairly allocated), questions and answers

5. The technical aspects for the network system described in this Asia Pacific CRV RFI are based on the "Common Regional Virtual Private Network (CRV) Of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) Concept of Operations", dated 19 June 2014.

6. Please include in your response any accompanying figures, tables, and commercial literature that

support the requested content of the RFI response. Technical data and accompanying information presented in a tabular or summary format will be acceptable. No elaborate technical, management, or cost proposals are being requested at this time however you are expected to provide price estimations for the technical solution proposed. **Also include responses to the questionnaire in the attached document "APAC CRV RFI Response Schedule".**

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Appendix F

ASIA PACIFIC CIVIL AVIATION AUTHORITIES AND AIR NAVIGATION SERVICE PROVIDERS

Request for Information (RFI)

Asia Pacific Common Regional Virtual Private Network (CRV)

RFI RESPONSE SCHEDULES

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INTRODUCTION

These are the Response Schedules for the Asia Pacific Civil Aviation Authorities and Air Navigation Service Providers Asia Pacific Common Regional Virtual Private Network (CRV) Request for Information. These schedules must be completed in full.

The Information Response Schedules set out in this RFI, describe the information that the Respondent is required to provide in their Response. It is the Respondent's responsibility to ensure that the information provided is clear, accurate and complete to allow a full assessment.

The Respondent must specifically address every item in each Information Response Schedule in the format set out and/or requested in that Schedule. Where the Respondent is required to provide additional requirements or further information, the Respondent must clearly mark the Schedule/Annexure with the applicable Schedule reference.

If a section is not applicable or relevant to the Response, please place "N/A" in the relevant schedule.

RESPONSE SCHEDULES CHECK LIST

Schedule	**Information Response Description and Summary**	**Complete** (Yes / No / NA)	**Comments** (e.g. title and location within Response
1	Respondents Details	Yes	
2	Infrastructure Capability And Capacity	Yes	
3	System Architecture	Yes	
4	Service level undertakings	Yes	
5	Network and Service Management	Yes	
6	Project implementation	Yes	
7	Financial considerations	Yes	
8	Contractual considerations	Yes	
9	Supplementary Information	Yes	
10		Yes	
11		Yes	
12		Yes	
13		Yes	
14		Yes	
15		Yes	

SCHEDULE 1: RESPONDENT'S DETAILS

The Respondent is required to provide the following information, as applicable:

1.1. Respondent's full name.

1.2. If a company, its registered office and principal place of business.

1.3. Any trading or business name.

1.4. Name and contact details of the representative in responsible for the Respondent's Response (who will be responsible for answering all requests for clarification or further information).

Name	
Position	
Postal Address	
Email	
Work office Phone	
Work Mobile phone	

1.5. Location of the Respondent's main administrative centre and the place(s) from which supply of the Requirement would be managed and supplied.

Notes: An Excel file entitled "APAC CRV Participant Site Schedule" known as "Site Schedule" in this document has been provided for response options to be submitted as part of the *Response*. The *Respondent* will annex this requirement to their *Response* marked as "Schedule 9.2 – CRV Participant Site Schedule".

This schedule will assist in recording and analysing common information across Participants sites and Respondents are encouraged to use the CRV Participant Site Schedule.

SCHEDULE 2: INFRASTRUCTURE CAPABILITY AND CAPACITY

.

2.1.	Describe your current network infrastructure in the Asia Pacific Region. Including details of your IP VPN Networking capabilities.
2.2.	List if possible current notable customers in the APAC region to whom you provide IP VPN Networking Services.
2.3.	Indicate in which countries you own your infrastructure and in which countries you lease or in partnership with another service provider for the provision of their telecommunications infrastructure.
Refer Site Schedule, Worksheet “Schedule Responses” Column H - M	
2.4.	There are 21 Participant sites during the initial phase of this RFI. In the future the CRV may require an additional 31 sites in the Asia Pacific region. Describe your ability to provide telecommunications services to all Participant sites as detailed in **Site Schedule**.
Refer Site Schedule, Worksheet “Schedule Responses” Column N	
2.5.	Provide details regarding your capabilities to deliver IP services using IPv6 and/or IPv4
Refer Site Schedule, Worksheet “Schedule Responses” Column O	
2.6.	List the typical Products/Services that are generally available to be provided, such as but not limited to International Private Line (IPL), Ethernet Virtual Private Line (EVLP), IP Virtual Private Network (IPVPN).
2.7.	If possible, list minimum and maximum Ethernet Line (Access) Speeds that are available at each Participants site.
Refer Site Schedule, Worksheet “Schedule Responses” Column P - Q	
2.8.	If possible, list minimum and maximum Ethernet Port Speeds that are available at each Participants site.

Refer Site Schedule, Worksheet “Schedule Responses” Column R - S

2.9. If possible, list physical handoff options the for the Products/Services such as but not limited to Single Mode Fibre, Multimode Fibre, Copper, etc
Refer Site Schedule, Worksheet “Schedule Responses” Column T

2.10. List the typical traffic that could be carried by the CRV such as but not limited to XOT, TCP, UDP and VoIP. List also what are your typical site requirements (installation, power, remote logical access, etc), detail if they vary in accordance with the service level agreement (expected performance).

2.11. Provide details of the class of service (CoS) that can be provided to segment traffic streams and prioritise the traffic such as but not limited to Voice, Video, Critical Data, Interactive Data, Standard Data, Low Priority Data

2.12. Include any additional information in relation to Infrastructure Capability And Capacity below

SCHEDULE 3: SOLUTION ARCHITECTURE

3.1.	Describe in detail your understanding of the function and purpose of Civil Aviation Authorities and Air Navigation Service Providers in the APAC Region and the services that they provide.
3.2.	Describe in detail your proposed typical solution architecture(s) for the CRV that could meet the requirements and address the issues as detailed in the Concept of Operations.
3.3.	Describe the scalability of proposed solution architecture.
3.4.	Describe the methodologies and process that would be used in the design of a solution and how you will iterate with the CRV Task Force to build and validate a final design.
3.5.	System security requirements apply to the protection of the physical information technology, the communications equipment, and the data. Protection also applies to the facilities, environment, hardware, software, and people associated with the CRV. Detail how you would protect data directly associated with the CRV from unauthorized disclosure, modification, or deletion and protect CRV services and resources from unauthorized use and denial of service.
3.6.	Detail any country to country data restrictions that may apply for data that is transported by an IP Network.
Refer Site Schedule, Worksheet “Data Restriction Matrix”	
3.7.	List reference customers to whom you have provided network related services where that customer’s traffic/data should be protected from third parties during transmission across a network.

3.8.	During the life of the CRV, it is intended that the CRV will interconnect to other regional CRVs such as EuroContols Pan-European Network Services (PENS). Detail your capabilities in enabling interconnects to other regional VPN Networks.

3.9.	Detail the key technical requirements in enabling interconnects to other regional VPN Networks provided by you or another Service Provider

3.10.	Include any additional information in relation to Solution Architecture below

SCHEDULE 4: SERVICE LEVEL UNDERTAKINGS

4.1.	Provide reference customers to whom you have provided network related services that support the customer's high availability environment.
4.2.	Provide reference customers to whom you have provided network related services where a network outage may contribute to safety of life concerns, and/or for whom you have contributed to a safety case.
4.3.	Describe your capability to meet the availability and reliability performance parameters as specified in the Concept of Operations, and how you would meet safety requirements. Indicate your awareness of Required Communication Performance (RCP) and Required Surveillance Performance (RSP) and how they would map on your design/organization.
4.4.	Detail the service levels and rebates that are available in respect to the following:- Service Delivery: Service Provisioning Time, Service Reliability: Service Availability and Mean Time to Restore Network Performance: Round Trip Delay, Packet Loss, and Jitter.
	For Service Delivery and Reliability, Refer Site Schedule, Worksheet "Schedule Responses" Column U – Z For Network Performance, Refer Site Schedule, Worksheet "Jitter & RTT Performance Matrix" and "PL Performance Matrix"
4.5.	Explain how/by whom service levels measurements would be done and reported during the life of the contract.
4.6.	Briefly describe the availability of enhanced service levels and if possible the associated costs
	Refer Site Schedule, Worksheet "Schedule Responses" Column AA
4.7.	Detail the methodologies used to support the network redundancy, availability, reliability and maintainability

4.8.	Include any additional information in relation to Service Level undertakings below

SCHEDULE 5: NETWORK AND SERVICE MANAGEMENT

5.1.	The CRV may cover up to more than 40 independent states and territories. Please describe your proposed customer service delivery engagement and contract management model to support the following stakeholders (as per Concept of Operations): - CRV Operation Oversight Group. - Each Participant

Note: for this schedule 5, you may refer to the ISO Telecommunications Management Network model and framework for network management **FCAPS**. *FCAPS* is an acronym for *fault*, *configuration*, *accounting*, *performance*, *security*, the management categories into which the ISO model defines network management tasks. Any explicit mapping to those task definitions in your response would be an asset.

5.2.	Describe your capability to provide a dedicated 24/7/365 Service Desk staff with technical personal that have awareness of aviation applications, knowledge of business recovery processes and knowledge of safety implications of disruption to the CRV

5.3.	Detail your general Global Service Desk including hours of contact, methods of contact, fault management, fault update guidelines, problem severities and national and international escalation process,

5.4.	Describe your change management and notification process for services impacted by your Planned Network Maintenance. This should include details supporting change to design documentation and scheduled maintenance.

5.5.	Describe your process for managing customer initiated changes

5.6.	Briefly describe your service management reporting, which could include network health, report faults, service restoration times, etc. Also detail the methods that these reports are available to be received.

5.7.	Briefly describe your typical end-to-end architecture(s) and capability to provide online (internet based) real-time monitoring and report tools available for use by the Participants own service desk or technical operations centres

	to provide their own first line fault/failure analysis.

5.8.	Include any additional information in relation to Network and Service Management below

SCHEDULE 6: PROJECT IMPLEMENTATION

6.1.	Summarize the main programmatic steps you will take to ensure the successful design, implementation, transition and cutover to operation of the CRV network system and required telecommunications services.

6.2.	Describe your basic program management approach, availability of management/technical staff and field resources.

6.3.	Provide an early high level milestone schedule of events and key decision points for the program as seen from your perspective and based on your experience with similar programs, also taking into account the close coordination with each Civil Aviation Authority/Air Navigation Service Provider for installation/decommissioning purposes.

6.4.	Identify any requirements for specific support, decisions, or actions required by the Participants during the course of the program that will affect your ability to meet your schedule commitments.

6.5.	Identify any long lead-time, development items, or implementation activities that may potentially impact your ability to meet Participants requirements for operational services.

6.6.	Include any additional information in relation to Project Implementation below

SCHEDULE 7: OPTIONAL: FINANCIAL CONSIDERATIONS

Important note: the following considerations will help the CRV Task Force to consolidate its cost benefit analysis and user requirements. They will not be made public in any way. The resulting cost benefit analysis will only quote prices without any reference to any vendor.

7.1.	Please indicate if pricing per Participant country includes or excludes local and or national government taxes and charges.
Refer Site Schedule, Worksheet “Schedule Responses” Column AB	
7.2.	For services offered to the Participants for operation and maintenance of the network, please detail the billing method(s) proposed (One-Time Charge, Monthly, Quarterly, Yearly, Pre-Paid, Post-Paid, etc).
7.3.	For billing services, please detail any proposed rebates for issues arising from incorrect billing
7.4.	Detail any conditions and potential cost associated with the early termination of service
Refer Site Schedule, Worksheet “Schedule Responses” Column AC	
7.5.	Provide any cost associated with customer initiated changes in US Dollars.
Refer Site Schedule, Worksheet “Schedule Responses” Column AD	
7.6.	Provide indicative costs for typical Port Speeds at the Participants Sites in US Dollars for services annually over a 5 year contract
Refer Site Schedule, Worksheet “Schedule Responses” Column AE - AH	
7.7.	Provide indicative costs for typical Line (Access) charges at the Participants Sites in US Dollars for services annually over a 5 year contract
Refer Site Schedule, Worksheet “Schedule Responses” Column AI - AL	
7.8.	Provide indicative one off costs associated with the provision of a new service

	at the Participants Site, including but not limited to commercial or enterprise works, setup of port charge, installation of access (NTU).
Refer Site Schedule, Worksheet “Schedule Responses” Column AM	
7.9.	Should a final architecture include a managed device on the Participants Site such as but not limited to a Router, Switch and or Firewall, please indicate the indicative annual costs associated with the provision of that device in US Dollars annually over a 5 year contract
Refer Site Schedule, Worksheet “Schedule Responses” Column AN - AO	
7.10.	Provide indicative recurrent costs for the provision of the core CRV network per country in US Dollars annually over a 5 year contract. If you plan to have a pricing scheme based on a number of countries/sites/Service Level Agreement/years, please provide early information.
Refer Site Schedule, Worksheet “Schedule Responses” Column AP	
7.11.	Provide information on other potential ongoing costs not covered in the RFI per country in US Dollars annually over a 5 year contract, such as project management, safety case, etc.
Refer Site Schedule, Worksheet “Schedule Responses” Column AQ	
7.12.	Include any additional information in relation to Financial Considerations below

SCHEDULE 8: CONTRACTUAL CONSIDERATIONS

8.1.	The CRV may cover up to 44 independent states and territories. Describe in detail your proposed method of contracting each of the participants for the proposed core CRV and the services installed at each of the Participants Sites
8.2.	Please provide minimum and maximum contract terms per Participant country, include any renewal notice periods.
8.3.	Include any additional information in relation to Contractual Considerations below

SCHEDULE 9: SUPPLEMENTARY INFORMATION

Respondents are required to provide the following information, as applicable:

9.1.	Respondents are to provide any and all supplementary information Respondents wants to provide. Any documents must be annexed to the Response and marked “Schedule 9.1 – Supplementary Information”.

SCHEDULE 10: DEFINITIONS

Item	Meaning
APAC	ICAO Asia Pacific Region
CRV	Asia Pacific Common Regional VPN
VPN	Virtual Private Network
Participants	Asia Pacific Civil Aviation Authorities and Air Navigation Service Providers as listed in “CRV Site Schedule”

Instructions:
The table below is to provide supporting information to the Main Response Schedule. If no information can be provided please insert "N/A".
Please insert additional column headings schedule references where necessary. If so, please reference this in the Response Schedule.

							Schedule 2.3	Schedule 2.3	Schedule 2.3	Schedule 2.3	Schedule 2.3	Schedule 2.4	Schedule 2.5	Schedule 2.7	Schedule 2.7	Schedule 2.8	Schedule 2.8	Schedule 2.9
State/Administration	ANSP/Civil Aviation Site	City	Services installation Address	Telephone / Fax	Stage 1 Procurement Particpant	Stage 2 Implementation Potential Participant	Does the Respondent operate in Country	Does the Respondent owns network Infrastrucutre	If Column H is no, name the Local Partnership in Country	Does the Respondent owns "last mile" network Infrastructure	If Column L is no, Name the "last mile" Owner	Can the Respondent provide Services in Country	Can the Respondent provide IPV4 and/or IPV6	Provide minimum Line (Access) Speed	Provide maximum Line (Access) Speed	Provide minimum Port Speed	Provide maximum Ethernet Port Speed	Typical physical handoff
Afghanistan		Kabul	Kabul International Airport	Tel.: Fax :	No	Yes												
American Samoa		Pago Pago	Pago Pago International Airport	Tel.: Fax :	No	Yes												
Australia	Airservices Australia	Brisbane	Air Traffic Services Centre Airport Drive, Eagle Farm, Queensland 4009 Australia	Tel.: +61-7-3866-3580 Fax :	Yes	Yes												
Australia	Airservices Australia	Melbourne	Air Traffic Services Centre, Tower Road Tullamarine, Victoria Australia	Tel.: 61 2 6268 4111 Fax :	Yes	Yes												
Bangladesh		Dhaka	Hazrat Shahjalal International Airport	Tel.: Fax :	No	Yes												
Bhutan		Paro	Paro Airport	Tel.: Fax :	No	Yes												
Brunei Darussalam		Brunei	Brunei International Airport	Tel.: Fax :	No	Yes												
Cambodia		Phnom Penh	Phnom Penh International Airport	Tel.: Fax :	No	Yes												
China		Beijing	Beijing Xijiao Airport	Tel.: Fax :	No	Yes												
China		Guangzhou	Guangzhou Baiyun International Airport	Tel.: Fax :	No	Yes												
China, Hong Kong		Hong Kong	Air Traffic Control Complex, 1 Control Tower Road, Hong Kong International Airport, Lantau, Hong Kong	Tel.: Fax :	Yes	Yes												
China, Macau	ADA- Administraiton of Airports	Macau	Macau International Airport PAC on Talpa Macao, China	Tel.: (+853) 2886 111 Fax :	Yes	Yes												
China, Taibei		Taibei			No	Yes												
Cook Islands		Rarotonga	Rarotonga International Airport	Tel.: Fax :	No	Yes												
Democratic People's Republic of Korea		Pyongyang	Pyongyang City	Tel.: Fax :	No	Yes												
Fiji	Airports Fiji Limited	Nadi	Nadi Air Traffic Management Center Nadi International Airport Queens Road, Nadi, Fiji	Tel.: Fax :	Yes	Yes												
French Polynesia		Papeete	Fa'a'ä International Airport	Tel.: Fax :	Yes	Yes												
India	Airports Authority of India	New Delhi	Rajiv Gandhi Bhawan New Delhi -110003	Tel.: 91-11-24652075 Fax : 91-11-24654142	Yes	Yes												
Indonesia	Jakarta ATS Centre	Jakarta	Soekarno-Hatta International Airport Jakarta, Tangerang, Banten 19120 Indonesia	Tel.: Fax :	No	Yes												
Indonesia	Makassar ATS Centre	Makassar	Sultan Hasanuddin International Airport Jalan Raya Airport No. 1 Makassar Sulawesi 90552, Indonesia	Tel.: Fax :	No	Yes												
Japan	Systems Development, Evaluation and Contingency Management Center (SDECC)	Osaka	2-2 Kuko Ikeda-city Osaka-pref 563-0034 Japan	Tel.: Fax :	Yes	Yes												
Japan	Air Traffic Management Center (ATMC)	Fukuoka	1302-17 Nata Higashi-ku Fukuoka-city Fukuoka-Pref 811-0204 Japan	Tel.: Fax :	Yes	Yes												
Kiribati		Tarawa	Bonriki International Airport	Tel.: Fax :	No	Yes												
Lao People's Democratic Republic		Vientiane	Wattay International Airport	Tel.: Fax :	No	Yes												
Malaysia	Kota Kinabalu Air Traffic Control Centre	Kota Kinabalu	Bangunan ATCC 88618 Kota Kinabalu Sabah	Tel : +6088 224911 Fax : +6088 219198	Yes	Yes												
Malaysia	Kuala Lumpur Air Traffic Control Centre (KL ATCC)	Selangor	Air Traffic Control Centre Block B, ATCC Complex Sultan Abdul Aziz Shah Airport 47200 Subang Selangor Darul Ehsan	Tel.: +603 78473573 Fax : +603 78473572	Yes	Yes												
Malaysia	Kuching Sub-Centre Kuching Air Traffic Control Centre	Kuching	Kuching International Airport 93728 Kuching Sarawak	Tel : +6082 455572 Fax : +6082 453199	Yes	Yes												
Maldives		Male	Malé International Airport	Tel.: Fax :	No	Yes												
Marshall Islands		Majuro	Marshall Islands International Airport	Tel.: Fax :	No	Yes												
Micronesia (Federated States of)		Chuuk/Kosrae/ Ponapei/Yap	Pohnpei International Airport	Tel.: Fax :	No	Yes												
Mongolia	Communication Navigation Surveillance section, Civil Aviation Authority of Mongolia	Ulaanbaatar	Khan-Uul district, 10th khoroo, Buyant-Ukhaa, Ulaanbaatar, Mongolia	Tel.: +976 11 281603 Fax : +976 1170049785	Yes	Yes												

Myanmar	Department Of Civil Aviation	Yangon	ATC Tower Building, Yangon Int'l Airport Airport Road, (11021), Mingaladon Tsp: Yangon, Myanmar.	Tel.: 95-1-533045 Fax :	Yes	Yes													
Nauru		Nauru	Nauru International Airport – Yaren	Tel.: Fax :	No	Yes													
Nepal		Kathmandu	Tribhuvan International Airport	Tel.: Fax :	No	Yes													
New Caledonia		Noumea	Nouméa Magenta Airport,	Tel.: Fax :	Yes	Yes													
New Zealand	Airways New Zealand	Christchurch,	20 Sir William Pickering Drive, Russley, Christchurch, New Zealand	Tel.: Fax :	Yes	Yes													
New Zealand	Airways New Zealand	Auckland,	Cyrill Kay Road, Auckland Airport, Auckland, New Zealand	Tel.: Fax :	Yes	Yes													
Niue Islands					No	Yes													
Pakistan		Karachi	Jinnah International Airport	Tel.: Fax :	No	Yes													
Palau		Koror	Roman Tmetuchl International Airport	Tel.: Fax :	No	Yes													
Papua New Guinea		Port Moresby	Jacksons International Airport Morea-Tobo Rd Port Moresby 121 Papua New Guinea	Tel.: Fax :	No	Yes													
Philippines	Civil Aviation of the Philippines	Pasay City	Old Mia Road, Pasay City, Philippines, 1300	Tel.: +63-2-8799255 Fax :	Yes	Yes													
Republic of Korea	AFTN Center	Seoul	62, Haneul-Gil Gangseo-Gu Seoul, 157-711, Korea	Tel.: + 823 28800335 Fax :	Yes	Yes													
Samoa		Faleolo	Faleolo International Airport	Tel.: Fax :	No	Yes													
Singapore	Singapore Air Traffic Control Centre	Singapore	LORADS II Building, 60, Biggin Hill Road, Singapore Postal Code 509950	Tel.: 6214 8050/65 Fax : 6545 9370	Yes	Yes													
Solomon Islands		Honiara	Honiara International Airport	Tel.: Fax :	No	Yes													
Sri Lanka		Colombo	Colombo Ratmalana Airport	Tel.: Fax :	No	Yes													
Thailand	Aeronautical Radio Of Thailand LTD	Bangkok	102 Ngamduplee Tungmahamek sathorn Bangkok Thailand 10120	Tel.: 0-2287-3531-41 Fax :	Yes	Yes													
Timor Leste		Dili	Presidente Nicolau Lobato International Airport	Tel.: Fax :	No	Yes													
Tonga		Tongatapu	Fua'amotu International Airport	Tel.: Fax :	No	Yes													
Tuvalu		Funafuti	Funafuti International Airport	Tel.: Fax :	No	Yes													
United States	FAA Oakland Air Route Traffic Control Center	Oakland	5125 Central Avenue Fremont, CA 94536-6531	Tel.: 510-745-3000 Fax :	Yes	Yes													
United States	FAA Salt Lake City Network Enterprise Management Center	Salt Lake City	2150 W. 700 N. Salt Lake City UT 84116	Tel.: 801-320-2172 Fax :	Yes	Yes													
Vanuatu		Port Vila	Bauerfield International Airport	Tel.: Fax :	No	Yes													
Viet Nam		Ho Chin Minh/Hanoi	Tan Son Nhat International Airport Noi Bai International Airport	Tel.: Fax :	No	Yes													
Wallis and Futuna		Wallis	Hihifo Airport	Tel.: Fax :	Yes	Yes													

Schedule 4.4						Schedule 4.6	Schedule 7.1	Schedule 7.4	Schedule 7.5	Schedule 7.6						Schedule 7.7						Schedule 7.8	Schedule 7.9		Schedule 7.10	Schedule 7.11
Detail the service levels and rebates that are available in respect to						Enhanced service levels	Includes or excludes Taxes	Early Termination costs formula	cost associated with customer initiated changes	Indicative annual cost for typical Port (US$)						Indicative annual cost for typical Line charges (Access)						Indicative one-off cost for the provision of a new Service	Managed device indicative annual cost (US$) if proposed in Solution 6.1		Core CRV network Cost	Potential ongoing costs not covered in the RFI
Service Provisioning Time (days)	Rebate	Service Availability (%)	Rebate	Mean Time to Restore (minutes)	Rebate					Minimum line speed available	Maximum line speed available:	1024 KB	2048 KB	4096 KB	8192 KB	Minimum line speed available	Maximum line speed available:	1024 KB	2048 KB	4096 KB	8192 KB		Managed Device Type	Cost		

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Appendix H

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Common Regional Virtual Private Network (CRV) Of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG)

Concept of Operations

INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA-PACIFIC OFFICE

Document Change Record

Version Number	Date	Reason for Change	Sections Affected
0.1	March 1, 2014	Initial Draft	All
0.2	March 28, 2014	Addition of Section 4	4
0.3	April 02, 2014	• Inclusion of comments from ICAO • Result of review by CRV Participants on 02 April14 Meeting	All
0.4	April 30, 2014	Modifications resulting from review in 0.3 above	All
0.5	June 3, 2014	Modifications resulting from ACSICG/TF meeting	All
0.6	June 19, 2014	Modifications resulting from participants' comments	All

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide a Concept of Operations (ConOps) for a Common Regional Virtual Private Network (CRV) to serve the Asia/Pacific Region. This would be an Internet Protocol (IP) based VPN using a private commercial network to provide service for the exchange of Air Traffic Service Message Handling System (AMHS) data and potentially other types of data. The Air Navigation Service Providers (ANSPs) of the Asia/Pacific Region see a clear need for an upgrade to the current telecommunications network, and the CRV is the recommended solution as determined by the Aeronautical Communication Services Implementation Coordination Group (ACSICG) of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) of the International Civil Aviation Organization (ICAO).

1.2 Background / Current Capability

Currently, aeronautical ground-ground communications in the ICAO Asia/Pacific Region, and in particular Aeronautical Fixed Telecommunication Network (AFTN) and AMHS services, operate over point-to-point international leased circuits. As pointed out by the ICAO survey on ground-ground communications performed early 2014, this network configuration exhibits a number of limitations, including (but not limited to):

- cost limitations: high costs per connection;
- a marked obsolescence threat due to ageing technologies and protocols (IPL, X25 etc);
- a need for telecommunication backup or diversity, although the current reliability is assessed as rather satisfactory;
- problems experienced with change management;
    - Need for separate requisition process for each new connection, generally a time-consuming and cumbersome process;
    - Limited flexibility for increase in bandwidth;
    - Limited flexibility for expansion to other end-points;
    - Need to deal with half circuit vs. full circuit arrangements, depending upon policies of ANSPs involved;
- A design that is not adapted to the current and new needs;
    - Potential duplication of network services as bandwidth for other types of data are generally obtained separately;
    - the inability to switch to new protocols like VoIP or SWIM with an efficient network design; and
- Heterogeneous practices as to performance requirements and monitoring.

A CRV Task Force (TF) was formally established in accordance with APANPIRG Decision (24/32), (Bangkok, Thailand, 24-26 June 2013).
There it was determined that a dedicated, common network operated by a service provider is a viable approach to be considered to replace the current configuration. Common networks have successfully been deployed in other ICAO regions (e.g. PENS in the EUR Region and MEVA in the CAR Region). Therefore, the Meeting adopted the following decision:

- **Decision 24/32 - Common Regional Virtual Private Network (VPN) Task Force**
  That, a Task Force with Subject Matter Experts (SME) be established to study the virtual private network and develop a detailed proposal by 2016. The Task Force reports the outcome of its study to APANPIRG through ACSICG and CNS SG.

1.3 Geographic Applicability

The initial intended geographic coverage of the CRV consists of the accredited States and Territories to ICAO Asia Pacific Regional Office.

1.4 Intended Audience

This ConOps presents a vision for establishing an IP VPN to provide efficient, cost-effective network services for AMHS and other IP-based services. The intended audience of this ConOps is the membership of ACSICG and all stakeholders who are interested in the acquisition and implementation of the CRV, including all interested parties of each ANSP in the ICAO Asia/Pacific Region. The document will also be presented to APANPIRG to be used during the approval process for the CRV. It can be used as a source of information for the development of the Request for Information (RFI) and Sealed Tender (ST) to be written and provided to potential vendors as part of the tender process.

1.5 Intended Benefits

The Asia/Pacific VPN is anticipated to provide a broad range of benefits to the CRV Members, including (but not limited to):

- Cost efficiencies as compared to multiple point-to-point connections;
- Reduced procurement time and effort, as each ANSP will require only the initial connection to the CRV;
- Potential to carry new services (i.e., ATFM, SWIM, etc.);
- Transition from the current bandwidth limitations to an harmonized and homogeneous level of network performance and services delivered by the

CRV Service Provider, including ease of growth, connectivity and modification;

- Potential for additional connectivity beyond the initial AFTN-like routing network, including both regional and inter-regional connectivity;
- Greater ease of handling of network service issues.

2 OPERATIONAL CONCEPT

2.1 Objective

The objective of the CRV is to offer a safe, secure, robust and cost effective telecommunications transport service to all Members, and to offer the possibility to all Candidates to contract to that service.

It will facilitate voice and data communications between Members by allowing all participants on the network to establish communications with each other. Telecommunication costs will be minimized as countries will only need a small number of connections to a far reaching network, rather than individual connections to each neighboring state.

Each user of the network will take responsibility for their own IT security. However, the network will support this security by being a closed private network, without access to the public Internet. Each Member can (and should) establish IT security protections so that they comply with their organization's security policies. At their discretion, some Members may also establish bi-lateral VPN overlays over the CRV to provide an additional layer of protection.

Finally, the network should support the telecommunication standards which the Region intends to use. Accordingly, it should carry both IP version 4 and 6.

2.2 Scope

The scope of the CRV is to provide a cross-border telecommunications network for Members in the ICAO Asia/Pacific Region. This network will allow each Member to easily communicate with any other Members in the Region. To facilitate the creation and on-going operation of this network, this document also includes the creation of the business rules and management for the network.

The network will be used to support the delivery of ATM services. It must be fit for purpose so that each ANSP can provide the highest levels of safety.

Finally, it is possible that over time the network will grow to include other users such as the military, airport, ATM industry and airlines. If this does occur then it is anticipated that this document will be revised to accommodate the increased scope of the additional stakeholders. If widely adopted, the CRV is a strong candidate to provide the network which underpins the future System Wide Information Management (SWIM).

2.3 Services Carried by the CRV Network

- Ground-ground voice ATM communications, referred to as voice communications

- Air-ground Data Link communications (in case we have one day ATN routers in common), referred to as Data Link communications
- Ground-ground ATS surveillance data, referred to as surveillance data
- Ground-ground AIDC data, referred to as AIDC data
- Ground-ground AIM data, referred to as AIM data
- Ground-ground ATFM data, referred to as ATFM data
- Ground-ground SWIM data, referred to as ATFM data
- Miscellaneous data: other data not pertaining to the categories above, or carried for TEST purpose only
- Any other category as agreed later

2.4 Use Cases

The Use Cases contained in this section illustrate how the proposed capability will operate and how users will interact.

2.4.1 Use Case 1 - ANSPs Interconnect AMHS

Summary of Situation

ANSP 'A' and ANSP 'B' wish to have a direct connection between their AMHS. Both ANSPs decide that the AMHS application shall be built upon the Aeronautical Telecommunication Network (ATN). The ATN will in turn use the CRV.

User Response

Each ANSP already has a connection to the CRV. Each ANSP:

1. Notifies the OOG Coordinator of their intention to establish the new facility.
2. Determines if their existing access speed is sufficient. If it is not the ANSP will arrange with the CRV Service Provider to increase their bandwidth.
3. Negotiates bi-laterally with the other ANSP to determine what IT security arrangements are required. In this User Case they decide to implement an IPSec VPN.
4. Negotiates bi-laterally with the other ANSP to determine what testing, acceptance and commissioning procedures are required.

Operational Needs

UC1.1 The CRV must meet the reliability and availability needs of AMHS.
UC1.2 The CRV must provide IP version 4 transport for the ATN.
UC1.3 The CRV must provide IP version 6 transport for the ATN.
UC1.4 The CRV must allow the ANSPs to implement IPSec VPN tunnels.
UC1.5 The CRV must allow for bandwidth changes.

2.4.2 Use Case 2 - ANSPs Implement ATC Voice Co-ordination Circuits

Summary of Situation

ANSPs 'A' and 'B' wish to build upon the success of their AMHS implementation and have identified four voice circuits which should be moved to the CRV.

User Response

Each ANSP already has a connection to the CRV. Each ANSP:

1. Notifies the OOG Coordinator of their intention to establish the new facility.
2. Determines if their existing access speed is sufficient. If it is not the ANSP will arrange with the Service Provider to increase their bandwidth.
3. Negotiates bi-laterally with the other ANSP to determine what IT security arrangements are required. In this User Case they decide to not implement an IPSec VPN as they see that their existing firewalls provide a compliant level protection.
4. Negotiates bi-laterally with the other ANSP to determine what testing, acceptance and commissioning procedures are required.
5. Each ANSP will tag the Voice over Internet Protocol (VoIP) and Session Initiation Protocol (SIP) data with appropriate priority markings to allow the CRV Service Provider to identify the voice traffic.

Operational Needs

UC2.1 The CRV must meet the reliability and availability needs of ATC voice.
UC2.2 The CRV must provide IP version 4 transport for the VoIP.
UC2.3 The CRV must provide IP version 6 transport for the VoIP.
UC2.4 The CRV will use the high priority tags in the packet headers to ensure that VoIP traffic is given high priority and minimal delay. The CRV must give an appropriate level of priority to SIP.
UC2.5 The CRV must deliver voice so that it is clearly understood with minimal delay.

2.4.3 Use Case 3 - ANSPs Share Automatic Dependent Surveillance-Broadcast (ADS-B) Data Along Their Border

Summary of Situation

ANSP 'B' and ANSP 'C' decide that sharing ADS-B data from ground stations along their border will improve safety. They decide to use the CRV to transport the data.

User Response

Each ANSP already has a connection to the CRV. Each ANSP:

1. Notifies the OOG Coordinator of their intention to establish the new facility.
2. Determines if their existing access speed is sufficient. If it is not the ANSP will arrange with the Service Provider to increase their bandwidth.
3. Negotiates bi-laterally with the other ANSP to determine what IT security arrangements are required. In this User Case they decide to implement an IPSec VPN.
4. Negotiates bi-laterally with the other ANSP to determine what testing, acceptance and commissioning procedures are required.
5. Each ANSP will tag the ADS-B data with a medium priority marking to allow the CRV Service Provider to give it an appropriate transport.

Operational Needs

UC3.1 The CRV must meet the reliability and availability needs of informational ADS-B.

UC3.2 The CRV must provide IP version 4 transport for the ADS-B.

UC3.3 The CRV must provide low drop rates and latency for ADS-B.

2.4.4 Use Case 4: ANSP 'A' is Experiencing Poor AMHS Service with ANSP 'B'

Summary of Situation

ANSP 'A' notices that AMHS service is not reliable with ANSP 'B'.

User Response

ANSP 'A' and ANSP 'B' both start to diagnose the problem by:

1. Checking their systems.
2. Notifying the CRV Service Provider.
3. Hopefully at this point the problem is discovered and resolved.
4. If no fault is found then the OOG Coordinator is notified. Each ANSP verifies stability of their AMHS system, including the ability (or lack thereof) to communicate with other ANSPs. Local network elements will be verified, and end-to-end stepwise validation will take place. This will provide enough information to determine the location of the fault.
5. The fault is rectified.

Operational Needs

UC4.1 The CRV Service Provider and the CRV Members must have a clear fault resolution process.

2.4.5 Use Case 5 - ANSP 'A' is Experiencing Poor Voice Communications With ANSP 'B'

Summary of Situation

ANSP 'A' notices that when their voice calls go to ANSP 'B' that the call quality is poor.

User Response

ANSP 'A' starts to diagnose the problem by:

1. Checking their systems.
2. Notifying both the CRV Service Provider and ANSP 'B' of the problem.
3. Hopefully at this point the problem is discovered and resolved.
4. If no fault is found then the OOG Coordinator is notified. Each ANSP takes a packet capture of the voice call at the interface boundary. The packet captures are compared and examined for problems. This will provide enough information to determine the location of the fault.
5. The fault is rectified.

Operational Needs

UC5.1 The CRV Service Provider and the CRV Members must have a clear fault resolution process.

2.4.6 Use Case 6 - ANSP 'B' Has Two Access Points and One Fails

Summary of Situation

ANSP 'B' has two CRV access points, one in city Alpha and one in city Beta. City Alpha's connection fails.

User Response

ANSP 'B' responds by:

1. Notifying the CRV Service Provider of the problem. The CRV Service provider commences rectification action.
2. AMHS is unaffected, as ANSP 'B' is using ATN and the ATN has automatically detected the fault and redirected traffic to use the city Beta path.
3. Current voice calls fail, but ATC have been provided with two methods to make their calls, one which is via city Alpha and one

by city Beta. ATC select the city Beta path and quickly re-establish communications.

4. The ADS-B sharing completely fails as it does not have a rerouting capability.
5. The CRV Service Provider fixes the fault and service delivery returns to normal.
6. The ANSP notifies the OOG Coordinator so that the performance of the CRV Service Provider is tracked.

Operational Needs

UC6.1 If an ANSP requires high availability then they must design into their applications a mechanism which can use dual CRV access points.
UC6.2 (optional) ANSPs wanting the network to automatically reroute in response to networking failures can implement bi-lateral measures.

2.4.7 Use Case X - The CRV Network Wants to Connect to Another Region

Summary of Situation

To be advised at a later date.

2.4.7.1.1.1 Safety Case

CRV will carry operational data, the failure of which may have impacts on the safety of operations. As safety risks must remain controlled, a Safety risk management process including hazard identification, safety risk assessment and the implementation of appropriate remediation measures has to be implemented.

The safety risk management component systematically identifies hazards that exist within the context of the delivery of CRV services. Hazards may be the result of systems that are deficient in their design, technical function, human interface or interactions with other processes and systems. They may also result from a failure of existing processes or systems to adapt to changes in the service providers' operating environments. Careful analysis of these factors during the planning, design and implementation phases can identify potential hazards before CRV becomes operational.

A list of Operational Hazards is attached to this CONOPS. The likelihood of their consequences occurring and severity will be assessed during the users' requirement process. For the risks that cannot be eliminated by design, the mitigation strategy to reduce the risks when it is not acceptable will be part of the user requirements, OOG procedures and/or CSP's procedures.

During the operational life cycle of the CRV network, reports or incident investigations will be analyzed by OOG to identify new safety hazards and/or monitor the frequency of occurrence. The escalation process will identify when any event is likely to have a safety impact handle it with appropriate care and urgency.

2.5 Stakeholders

The initial primary stakeholders of the CRV will be the set of ANSPs that form the group of founding members of the CRV. These will be the members which agree to the initial contract with the CRV Service Provider. As other ANSPs subsequently elect to join the CRV, they will be added to the primary stakeholders group. Other potential stakeholders may include military, airport, and airline representatives should it become practical for them to join the network.

Secondary stakeholders may include service providers and manufacturers, as well as military, airport, and airline representatives who may not join the network but could be associated users, via a gateway, for example.

2.6 Capability Description

The CRV is required to provide a telecommunications network between Members. While there are some common requirements, each Member will have different needs and it is expected that a variety of connections will be established.

2.6.1 Accessibility

The CRV Service Provider shall offer access to the CRV network to every Member. The location of the interface point shall be at the Member's premises.

2.6.2 Physical Connectivity Between Member and CRV Service Provider

The choice of physical connector type to be used between the Member and the CRV Service Provider is a matter for those two organizations to decide. Commonly this may be 100/1000 BaseT Ethernet; however, other technologies are possible.

Each Member will determine the number and location of connections to the CRV Service Provider. Those Members who chose to have more than one connection will gain the benefits of network diversity and higher availability. However, this diversity and higher availability may be dictated at some connection points by the performance and safety requirements, depending of the role played by the Member regarding a particular application (example: hosting an application hub, or an interregional connection).

2.6.3 Access Bandwidth and Quality of Services (QoS)

Each CRV Member shall determine what amount of bandwidth they require for each Quality of Service (QoS) sub queue. For example, a Member may decide that they need 128kbps of high priority voice bandwidth, plus 512kbps of low priority traffic.

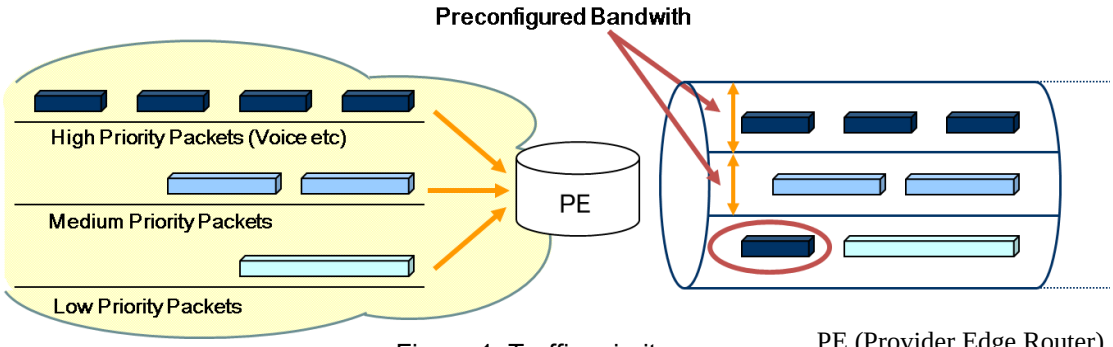


Figure 1: Traffic priority

PE (Provider Edge Router)

In addition, each CRV Member will determine the total access bandwidth that they need to purchase.

2.6.4 Network Security

The CRV is to be a private network, only available and dedicated to CRV Members. It is not to be connected to the public Internet and should not share the infrastructure with the public Internet. It is anticipated that Members will work bi-laterally to agree on their security arrangements so that they comply with their organizations' security policies and minimal requirements, if any, as set by the OOG Coordinator. Any change to these initial arrangements should be coordinated with the OOG Coordinator. Some members may

choose to use only a firewall, while others may require a firewall and an encrypted VPN. The firewall is provided by the CRV Member and remains under its responsibility. In Appendix A is provided a table of operational threats for each type of data.

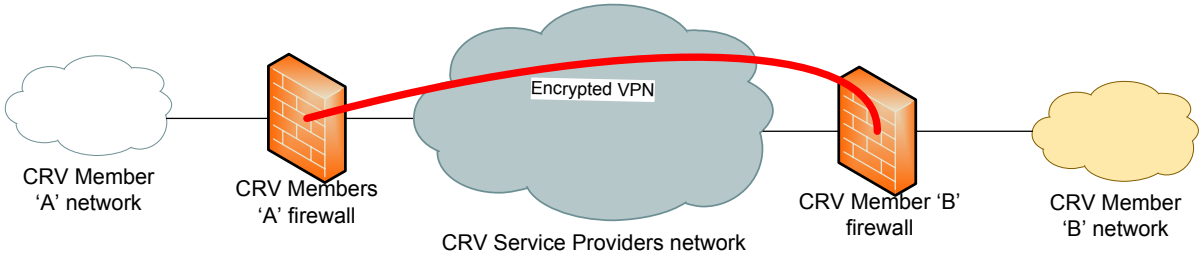


Figure 2: Example of an encrypted Virtual Private Network (VPN)

To facilitate these overlays the network will accommodate packets of at least 1550 bytes in length, without requiring packet fragmentation.

2.6.5 Capacity for Growth and Expansion

It is expected that the network will require greater speeds over time as more Members join and additional applications are added. If a Member requires a speed or class of service upgrade, this should ideally be a simple process whereby the Member contacts the OOG Coordinator to arrange for an upgrade.

2.6.6 Network Monitoring

The CRV Service Provider shall provide their networking equipment into the Members' premises. The CRV Service Provider shall manage and monitor the private network to promptly identify faults and performance degradations. On detecting an issue the CRV Service Provider will notify the CRV Member(s) and OOG coordinator and a fault rectification process will commence under the coordination by the OOG coordinator.

2.6.7 Reporting

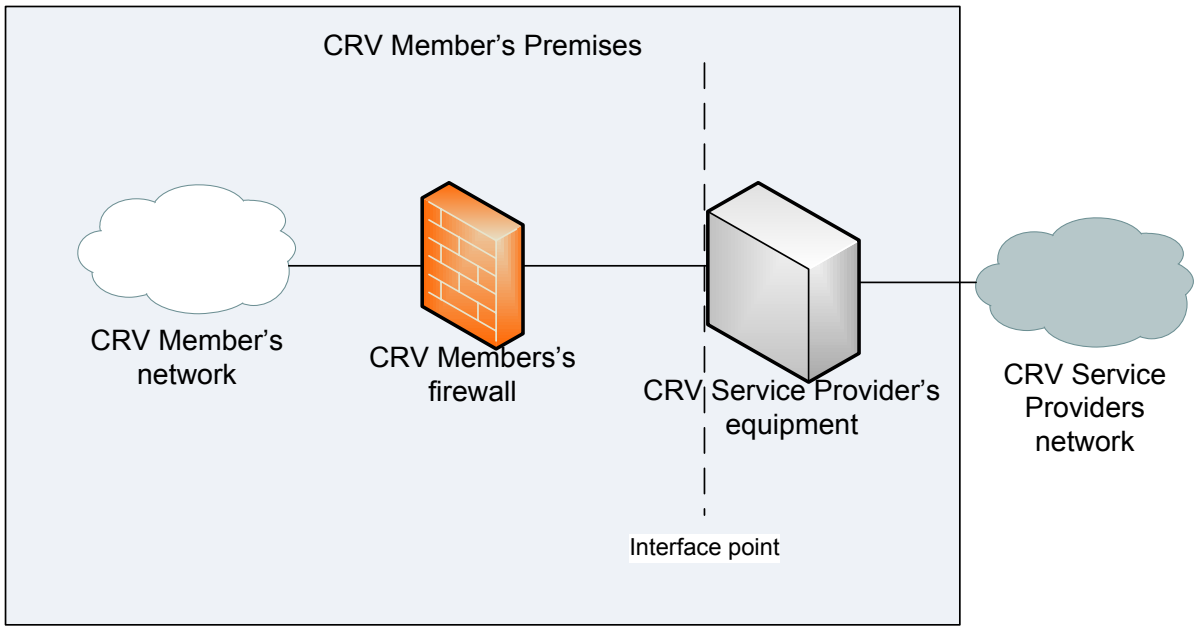
The CRV Service Provider shall provide a monthly performance report to the OOG Coordinator. The report shall include the availability of each access link, any areas of congestion and a summary of notable events (e.g. additions or removal of accesses, discussion on any failures, physical configuration, etc.). The Coordinator will make this report available to the all Members.

2.6.8 Service Notifications

The CRV Service Provider shall provide at least 10 days advance notice to a Member and OOG coordinator of any planned maintenance which will result in a loss or degradation of service.

2.6.9 Network Design and IP Addressing

The CRV Service Provider shall provide the network design. It is anticipated that the typical Member interface will adopt the interface design shown below.



IP version 4 and version 6 address space will be proposed by the CRV Service Provider and agreed with the CRV Coordinator during the procurement process. It is anticipated that Members will need to use Network Address Translation (NAT) due to the various IP addressing schemes used by the Members. The OOG Coordinator will manage the Regional IP address plan after the contract is awarded.

2.7 Support Environment

Day to day support will be provided by the CRV Service Provider. This includes issues such as billing, reporting, fault detection and fault finding.

Members hold the responsibility for ensuring that their access links are appropriately sized and configured. When establishing new inter-Member links these will need to be documented and implemented bi-laterally between the two Members, in coordination with the OOG Coordinator.

For testing purposes, each Member can choose to either use an operational access or to establish a dedicated test access point.

3 REGULATORY REQUIREMENTS

3.1 ICAO Standards and Regulations

The CRV service shall support all functional and performance requirements for Aeronautical Fixed Service (AFS) as specified in ICAO Annex 10-Aeronautical Telecommunication, Volume III-Communication Systems, Part I-Digital Data Communication Systems and Part II-Voice Communication Systems.

The following are the sections that are applied to the CRV service:

1. Part I-Digital Data Communication Systems (AFTN/AMHS/AIDC)
    a. Chapter 3-Aeronautical Telecommunication Network (ATN)
    b. Chapter 8-Aeronautical Telecommunication Fixed Network (AFTN)
2. Part II-Voice Communication Systems.
    a. Aeronautical Speech Circuits (VoIP and legacy interface conversion to IP)

The CRV shall also support the functional and performance characteristics as specified in the following ICAO Documents:

1. 9896 ATN Manual for The ATN Using Internet Protocol Suite (IPS)
2. 9880 Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols

The CRV service planning, procurement and implementation shall be compliant against the ICAO Supplementary Provisions Doc 7030 and Regional Air Navigation Plan Doc 9673.

The safety case supporting the performance and safety requirements shall be conducted following ICAO Doc 9859 (Safety Management Manual).

3.2 ANSP Specific Requirements

Any specific requirement that is not specified in the document indicated in Section 3.1 above shall be applied strictly between the CRV service provider and respective ANSP through bi-lateral contract document.

4 NETWORK GROWTH AND TRANSITION

4.1 Initial Phase of Operation

The initial operation of the CRV service is expected to include all Pioneer Parties as well as all Members which have elected to sign a contract with the Service Provider. Initially, it is likely that the CRV service shall be used to provide a platform for IP services that are either existing (currently using the point-to-point circuits which the CRV is intended to replace), or planned for the very near term (those services which would very likely have been hosted on point-to-point connections absent the benefit of the CRV). In general, the initial function of the CRV will be for the exchange of AMHS data between Members. However, as described below, it is envisioned that additional services and applications could be added to the CRV in the future.

4.2 Additional Participants in CRV

New States /Administrations of the ICAO Asia/Pacific Region may opt in to become Members of the CRV, as such need and intent arises. This process shall be conducted via the OOG Coordinator.

4.3 Effect of CRV on Boundary Intermediate Systems (BIS) and Backbone Boundary Intermediate Systems (BBIS)

The current view of the Asia/Pacific ATN is of a network that is supported by a series of BIS and BBIS routers. These roles of these routers are as described in ICAO Document 9705. Currently, it is anticipated that there will be no change to this view of the Asia/Pacific ATN in the initial phase of operation of the CRV.

4.4 CRV Network Expansion

Network expansion of the CRV can be thought of in several ways, as described in the following sections.

4.4.1 Expansion of Membership

As described above, there may be new Members added as members of the CRV. This may be for purposes of AMHS connectivity or for other potential purposes as discussed below.

4.4.2 Expansion of Connectivity

While the initial connectivity within the CRV is expected to mirror current AFTN routing as per ICAO routing charts, the CRV may present opportunity for additional connectivity between members. While a point-to-point architecture (as used today) requires

additional physical connections to be procured to add new connectivity between Members, the use of a common network (such as the CRV) provides the potential for any-to-any connectivity among its configured members. This may offer the opportunity for future expansion of connectivity between Members, thereby providing increased efficiency of routing and route diversion within the Region.

4.4.3 Expansion of Use and Applicability

While the initial use of the CRV is intended to be for AMHS, consideration should be given in the future to utilizing the network non-AMHS applications, as listed in paragraph 2.3. For Members, the carriage of such applications may induce new classes of service or requirements. Such change as an increase in bandwidth would be obtainable in a much simpler manner than for point-to-point connectivity. For example, applications such as System Wide Information Management (SWIM), once deployed to the Region, may be able to use the CRV, thereby eliminating the need for acquisition of new network resources.

REFERENCES

To be supplied.

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ACSICG	Aeronautical Communication Services Implementation Coordination Group
ADS-B	Automatic Dependent Surveillance-Broadcast
AFS	Aeronautical Fixed Service
AFTN	Aeronautical Fixed Telecommunication Network
AMHS	Air Traffic Service Message Handling System
ANSP	Air Navigation Service Provider
APANPIRG	Asia/Pacific Air Navigation Planning and Implementation Regional Group
Asia/Pac	Asia/Pacific
ATC	Air Traffic Control
ATM	Air Traffic Management
ATN	Aeronautical Telecommunication Network
BBIS	Backbone Boundary Intermediate System
BIS	Boundary Intermediate System
CAR	Caribbean Region
ConOps	Concept of Operations
CRV	Common Regional Virtual Private Network
EUR	European Region
ICAO	International Civil Aviation Organization
IP	Internet Protocol
IPS	Internet Protocol Suite
NAT	Network Address Translation
OH	Operational Hazard
OOG	Operation Oversight Group
QoS	Quality of Service
RFI	Request for Information
RFP	Request for Proposal
SIP	Session Initiation Protocol
SME	Subject Matter Expert
ST	Sealed Tender
SWIM	System Wide Information Management
TF	Task Force
UC	Use Case
VoIP	Voice Over Internet Protocol
VPN	Virtual Private Network

Appendix A: list of operational hazards and threats relating to the CRV services

	Loss of	Unavailability of	Late delivery of	Out of sequence delivery of	Corruption of	Misdirection of	Denial of service for	Alteration of	Spoofing of
AMHS/FPL	OH-FPL1	OH-FPL2	OH-FPL3	OH-FPL4	OH-FPL5	OH-FPL6	OT-FPL1	OT-FPL2	OT-FPL3
AMHS/NOTAM	OH-NOTAM1	OH-NOTAM2	OH-NOTAM3	OH-NOTAM4	OH-NOTAM5	OH-NOTAM6	OT-NOTAM1	OT-NOTAM2	OT-NOTAM3
AMHS/MET or WXXM data	OH-MET1	OH-MET2	OH-MET3	OH-MET4	OH-MET5	OH-MET6	OT-MET1	OT-MET2	OT-MET3
Voice communications	OH-Voice1	OH-Voice2	OH-Voice3	OH-Voice4	OH-Voice5	OH-Voice6	OT-Voice1	OT-Voice2	OT-Voice3
Data Link communications	OH-DLK1	OH-DLK2	OH-DLK3	OH-DLK4	OH-DLK5	OH-DLK6	OT-DLK1	OT-DLK2	OT-DLK3
Surveillance data	OH-SUR1	OH-SUR2	OH-SUR3	OH-SUR4	OH-SUR5	OH-SUR6	OT-SUR1	OT-SUR2	OT-SUR3
AIDC data or FIXM data	OH-FPL1	OH-FPL2	OH-FPL3	OH-FPL4	OH-FPL5	OH-FPL6	OT-FPL1	OT-FPL2	OT-FPL3
AIM data or AIXM data	OH-AIM1	OH-AIM2	OH-AIM3	OH-AIM4	OH-AIM5	OH-AIM6	OT-AIM1	OT-AIM2	OT-AIM3
ATFM data	OH-ATFM1	OH-ATFM2	OH-ATFM3	OH-ATFM4	OH-ATFM5	OH-ATFM6	OT-ATFM1	OT-ATFM2	OT-ATFM3
Miscellaneous data (*)	OH-MISC1	OH-MISC2	OH-MISC3	OH-MISC4	OH-MISC5	OH-MISC6	OT-MISC1	OT-MISC2	OT-MISC3

OH	Operational Hazard
OT	Operational Threat
NOTAM	A Notice to Airmen
FPL	Flight Plan
MET	Meteorological Service
AIDC	ATS Interfacility Data Communications
MET	Meteorological Service
AMHS	Aeronautical Message Handling System
(*)	Other data not pertaining to the categories above, or carried for TEST purpose only

WXXM	Weather Information Exchange Models
AIXM	Aeronautical Information Exchange Model
FIXM	Flight Information eXchange Model
ATFM	Air Traffic Flow Management