INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Regional Office

REGIONAL PROJECT RLA/03/901
REDDIG Management System and Satellite Segment Administration

ELEVENTH MEETING OF THE COORDINATION COMMITTEE (RCC/11)

(Lima, Peru, 5 - 6 May 2008)

Agenda
Item 2: **Report of 2007 Activities**

FOLLOW UP OF MEVA II/REDDIG INTERCONNECTION ACTIVITIES

(Presented by the Secretariat)

Summary

This working paper describes progress attained in MEVA II/REDDIG networks interconnection according to activities foreseen in the revised action plan approved during the Fifth MEVA II/REDDIG Coordination Meeting, held in Mexico City, from 3 to 5 October 2007.

References:
- Report of the Fifth MEVA II/REDDIG Coordination Meeting *(Mexico City, 3-5 October 2007)*
- MEVA II Service Supplier's response to the RFP
- REDDIG Administration's response to the RFP

1. Background

1.1 During the fifth MEVA II/REDDIG coordination meeting (MR/5), held in Mexico City, from 3 to 5 October 2007, responses for the MEVA II/REDDIG interconnection presented by the MEVA II Service Supplier and the REDDIG Administration were presented to the Proposal request (RFP). Responses to RFP present a technical analysis of the proposed solution for the MEVA II/REDDIG interconnection implementation, as well as fixed and recurrent costs derived from the implementation and supply of inherent service.

1.2 In order that the REDDIG Administration can implement the interconnection of the REDDIG with the MEVA II, the meeting requested the MEVA II service supplier the contract format for revision –Conclusion MR5/5 (Request for a contract form proposal between MEVA II service supplier and REDDIG administration).

1.3 Also, during the fifth meeting the action plan for the MEVA II / REDDIG inter-connection was reviewed and approved.

2 Analysis

2.1 **Appendix A and B** of this working paper present the revised responses to the RFP from MEVA II service supplier and REDDIG Administration. The Fifth MEVA II/REDDIG Coordination Meeting, when analyzing responses of the RFP considered that these presented in a detailed way all the required aspects to carry out MEVA II/REDDIG interconnection.

2.2 MEVA II service supplier sent the contract form to the Mexico Regional Office at the beginning of November 2007. This was forwarded to ICAO Montreal Technical Cooperation Bureau at the beginning of December 2007. The revision of the contract by the Technical Cooperation Bureau has been considerable delayed in spite of the various letters that the REDDIG Administration has sent in order to expedite contract analysis and signature.

2.3 ICAO Technical Cooperation Bureau, once analyzed the contract, considered that according to purchase procedures, the contract could not be assigned directly to a firm without a bidding process. In this regard, the Technical Cooperation Bureau informed that they will proceed to a bid process which will have a duration of approximately two months since the date of reception of the letter (18 April 2008).

2.4 To supply the service, the technical cooperation section considered to address to the MEVA II service supplier since due to particular characteristics of the MEVA II/REDDIG interconnection this can only be implemented by the MEVA II supplier. In this regard, the MEVA II service supplier was requested to modify the contract format in order to include, only, recurrent services (voice and data services) and to revise the economical proposal.

2.5 The Meeting might recall that the equipment and installation cost for the interconnection of the REDDIG nodes with the MEVA II will be covered proportionally by all the REDDIG members, which was decided unanimously between the REDDIG members.

2.6 Considering that the REDDIG interconnection with MEVA II is a consequence o fan unanimous decision of the REDDIG members, it would be convenient that the Meeting analyze the possibility that recurrent costs for the access to the MEVA II network would also be proportionally paid by REDDIG State members.

2.7 Also, recurrent costs of AFTN and voice circuits between the REDDIG node in Bogotá and the corresponding nodes of the MEVA II network will be paid by Brazil, Colombia, Ecuador, Peru and Venezuela.

2.8 As a consequence of the delay in the signature of the contract with AGS, the dates of the action plan work programme approved during the Fifth MEVA II/REDDIG Coordination Meeting have been updated. This information is being presented in **Appendix C** to this working paper.

2 **Suggested action**

2.1 The Meeting is invited to:

a) take note of the information being presented;

b) analyze the RFP response presented by MEVA II service supplier, which is included as Appendix A to t his working paper;

c) take note of the recurrent services cost presented as Appendix A;

d) take note of the analysis carried out by ICAO technical cooperation regarding the contract form presented by AGS. Please refer to paragraphs 2.3 and 2.4 of section 2 of this working paper.

e) analyse the possibility that recurrent cost referred to MEVA II satellite access be paid proportionally by all REDDIG member Status, the same as the equipment that is necessary to communicate REDDIG nodes with respective MEVA II nodes, paragraphs 2.5 and 2.6 of this working paper;

f) analyse the amendments to the action plan for the MEVA II/REDDIG interconnection, presented in Appendix C to this working paper;

g) examine any other related item that the Meeting deems appropriate.

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APENDICE A/APPENDIX A

AGS RESPONSE TO THE INTERNATIONAL CIVIL AVIATION ORGANIZATION

REQUEST FOR TECHNICAL AND COST PROPOSAL (RFP)

For

INTERCONNECTION OF THE MEVA II AND REDDIG SATELLITE TELECOMMUNICATIONS NETWORKS

VOLUME II – COST PROPOSAL

Pricing Proposal - Table of Contents

Non-Recurring Summary

SITE LOCATION	EQUIPMENT NRC FEE	SPARES EQUIPMENT NRC	TOTAL EQUIPMENT NRC	PROPOSED SITE SURVEY & TRAVEL NRC	PROPOSED NETWORK INTEGRATION/INSTALL & TRAVEL NRC	PROPOSED SHIPPING NRC	PROPOSED ACTIVATION	TOTAL SURVEY, INSTALL, SHIPPING & ACTIVATION NRC	TOTAL NON-RECURRING CHARGES
COCESNA	$ 26,124.26	$ 11,677.50	$ 37,801.76	$ 3,487.50	$ 12,510.16	$ 3,346.88		$ 19,344.54	**$ 57,146.29**
BRAZIL	$ -	$ -	$ -	$ -	$ 4,791.41	$ -		$ 4,791.41	**$ 4,791.41**
ARUBA	$ -	$ -	$ -	$ -	$ 4,791.41	$ -		$ 4,791.41	**$ 4,791.41**
CURACAO	$ 1,076.63	$ 1,076.63	$ 2,153.25	$ -	$ 7,410.16	$ 360.94		$ 7,771.10	**$ 9,924.35**
CARACAS	$ 57,473.01	$ -	$ 57,473.01	$ 3,487.50	$ 12,510.16	$ 3,346.88	$ 2,500.00	$ 21,844.54	**$ 79,317.55**
BOGOTA	$ 28,124.01	$ -	$ 28,124.01	$ 3,487.50	$ 12,510.16	$ 3,346.88	$ 2,500.00	$ 21,844.54	**$ 49,968.55**
JAMAICA	$ 891.00	$ -	$ 891.00	$ -	$ 7,410.16	$ 360.94		$ 7,771.10	**$ 8,662.10**
MIAMI	$ 8,572.50	$ -	$ 8,572.50	$ -	$ 7,410.16	$ 360.94		$ 7,771.10	**$ 16,343.60**
PANAMA	$ 2,190.38	$ -	$ 2,190.38	$ -	$ 7,410.16	$ 360.94		$ 7,771.10	**$ 9,961.48**
SAN JUAN	$ 2,004.75	$ -	$ 2,004.75	$ -	$ 7,410.16	$ 360.94		$ 7,771.10	**$ 9,775.85**
PERU	$ -	$ -	$ -	$ -	$ 4,791.41	$ -		$ 4,791.41	**$ 4,791.41**
ECUADOR	$ 2,835.00	$ 1,417.50	$ 4,252.50	$ -	$ 4,791.41	$ 360.94		$ 5,152.35	**$ 9,404.85**
									$264,878.85

Table 1: MEVA II - REDDIG Interconnection Non-Recurring Cost Summary

Monthly Recurring Summary

SITE LOCATION	Network Access Fee	AFTN CIRCUITS	PAMA CIRCUITS	DAMA CIRCUITS	Bandwidth	TOTAL Bandwidth & Network Access MONTHLY RECURRING CHARGES
COCESNA				2	$ 236.00	**$ 236.00**
BRAZIL	$ 279.24	1			$ 245.00	**$ 524.24**
ARUBA				1	$ 118.00	**$ 118.00**
CURACAO		1		1	$ 363.00	**$ 363.00**
CARACAS	$ 1,380.48	2		3	$ 844.00	**$ 2,224.48**
BOGOTA	$ 822.00	1		5	$ 835.00	**$ 1,657.00**
JAMAICA				1	$ 118.00	**$ 118.00**
MIAMI		2			$ 490.00	**$ 490.00**
PANAMA		1	1	1	$ 468.00	**$ 468.00**
SAN JUAN		1		1	$ 363.00	**$ 363.00**
PERU	$ 279.24	1			$ 245.00	**$ 524.24**
ECUADOR					$ -	**$ -**
						$ 7,085.96

CIRCUIT PRICE LIST

AFTN Circuit/half circuit	**$**	**245.00**
PAMA Voice Channels/half circuit	**$**	**105.00**
DAMA Voice Channels/port	**$**	**118.00**

Table 2: MEVA II - REDDIG Interconnection Monthly Recurring Summary

TOTAL REDDIG PRICE – PURCHASE PRICE OPTION

SITE LOCATION	TOTAL NON-RECURRING CHARGES	TOTAL MONTHLY RECURRING CHARGES	BASE TERM (Five Year Contract)	OPTION YEAR 1	OPTION YEAR 2	OPTION YEAR 3	OPTION YEAR 4	OPTION YEAR 5	TOTAL
COCESNA	$ 57,146.29	$ 236.00	$ 71,306.29	$ 2,832.00	$ 2,832.00	$ 2,832.00	$ 2,832.00	$ 2,832.00	$ 85,466.29
BRAZIL	$ 4,791.41	$ 524.24	$ 36,245.81	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 67,700.21
ARUBA	$ 4,791.41	$ 118.00	$ 11,871.41	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 18,951.41
CURACAO	$ 9,924.35	$ 363.00	$ 31,704.35	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 53,484.35
CARACAS	$ 79,317.55	$ 2,224.48	$ 212,786.35	$ 26,693.76	$ 26,693.76	$ 26,693.76	$ 26,693.76	$ 26,693.76	$ 346,255.15
BOGOTA	$ 49,968.55	$ 1,657.00	$ 149,388.55	$ 19,884.00	$ 19,884.00	$ 19,884.00	$ 19,884.00	$ 19,884.00	$ 248,808.55
JAMAICA	$ 8,662.10	$ 118.00	$ 15,742.10	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 22,822.10
MIAMI	$ 16,343.60	$ 490.00	$ 45,743.60	$ 5,880.00	$ 5,880.00	$ 5,880.00	$ 5,880.00	$ 5,880.00	$ 75,143.60
PANAMA	$ 9,961.48	$ 468.00	$ 38,041.48	$ 5,616.00	$ 5,616.00	$ 5,616.00	$ 5,616.00	$ 5,616.00	$ 66,121.48
SAN JUAN	$ 9,775.85	$ 363.00	$ 31,555.85	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 53,335.85
PERU	$ 4,791.41	$ 524.24	$ 36,245.81	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 67,700.21
ECUADOR	$ 9,404.85	$ -	$ 9,404.85	$ -	$ -	$ -	$ -	$ -	$ 9,404.85
TOTAL	**$ 264,878.85**	**$ 7,085.96**	**$ 690,036.45**	**$ 85,031.52**	**$ 85,031.52**	**$ 85,031.52**	**$ 85,031.52**	**$ 85,031.52**	**$ 1,115,194.05**

Table 3: MEVA II - REDDIG Interconnection Total REDDIG Price - Purchase Price Option

TOTAL REDDIG PRICE – EQUIPMENT LEASE OPTION

SITE LOCATION	NON-RECURRING CHARGES	MONTHLY RECURRING EQUIPMENT LEASE	MONTHLY RECURRING SPACE SEGMENT	BASE TERM (Five Year Contract)	OPTION YEAR 1	OPTION YEAR 2	OPTION YEAR 3	OPTION YEAR 4	OPTION YEAR 5	TOTAL
COCESNA	$ 19,344.54	$ 1,641.00	$ 236.00	$ 131,964.54	$ 22,524.00	$ 22,524.00	$ 22,524.00	$ 22,524.00	$ 22,524.00	$ 244,584.54
BRAZIL	$ 4,791.41	N/A	$ 524.24	$ 36,245.81	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 67,700.21
ARUBA	$ 4,791.41	N/A	$ 118.00	$ 11,871.41	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 18,951.41
CURACAO	$ 9,924.35	N/A	$ 363.00	$ 31,704.35	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 53,484.35
CARACAS	$ 21,844.54	$ 2,496.00	$ 2,224.48	$ 305,073.34	$ 56,645.76	$ 56,645.76	$ 56,645.76	$ 56,645.76	$ 56,645.76	$ 588,302.14
BOGOTA	$ 21,844.54	$ 1,221.00	$ 1,657.00	$ 194,524.54	$ 34,536.00	$ 34,536.00	$ 34,536.00	$ 34,536.00	$ 34,536.00	$ 367,204.54
JAMAICA	$ 8,662.10	N/A	$ 118.00	$ 15,742.10	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 1,416.00	$ 22,822.10
MIAMI	$ 7,771.10	$ 372.00	$ 490.00	$ 59,491.10	$ 10,344.00	$ 10,344.00	$ 10,344.00	$ 10,344.00	$ 10,344.00	$ 111,211.10
PANAMA	$ 9,961.48	N/A	$ 468.00	$ 38,041.48	$ 5,616.00	$ 5,616.00	$ 5,616.00	$ 5,616.00	$ 5,616.00	$ 66,121.48
SAN JUAN	$ 9,775.85	N/A	$ 363.00	$ 31,555.85	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 4,356.00	$ 53,335.85
PERU	$ 4,791.41	N/A	$ 524.24	$ 36,245.81	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 6,290.88	$ 67,700.21
ECUADOR	$ 9,404.85	N/A	$ -	$ 9,404.85	$ -	$ -	$ -	$ -	$ -	$ 9,404.85
TOTAL	**$ 132,907.58**	**$ 5,730.00**	**$ 7,085.96**	**$ 901,865.18**	**$ 153,791.52**	**$ 153,791.52**	**$ 153,791.52**	**$ 153,791.52**	**$ 153,791.52**	**$ 1,670,822.78**

Table 4: MEVA II - REDDIG Interconnection - Total REDDIG Price - Equipment Lease Option

PRICING NOTES

1. This quote is valid for a period of thirty (30) days.
2. AFTN and PAMA circuit pricing is based on half circuit pricing and are allocated to each end of the circuit.
3. Lease term is a minimum of 3 years. Customer may exercise option to purchase leased equipment after base year of 5 years. Government has the option to purchase the equipment for $1.00 after the original contract term.
4. Translation services for member state contract generation are not included in this pricing and upon request will be priced separately.
5. Reference Technical Volume for member state equipment list provided in non-recurring charges.
6. Reference Technical Volume for member state spare equipment list provided in non-recurring charges.
7. Space Segment (bandwidth) Usage includes bandwidth, network access fee and infrastructure allocation costs.
8. A site survey will be conducted at each of the interconnect sites including COCESNA, Bogota and Caracas.
9. MEVA II member states are not required to pay an additional network access fee monthly recurring charge to access REDDIG network, only REDDIG sites are required to pay this monthly recurring charge.
10. Brazil, Peru and Ecuador are required to pay a portion of the monthly recurring network access fee as their communications are going through one of the interconnect sites.
11. Bogota site option to purchase redundant 60 watt BUC package is $28,620.00. Redundant 60 watt BUC package includes two (2) 60 watt BUCs and a C-Band 1+1 TX Redundant Kit.

APPENDIX B

INTERNATIONAL CIVIL AVIATION ORGANIZATION

RLA/03/901 PROJECT
REDDIG MANAGEMENT SYSTEM AND SATELLITE SEGMENT ADMINISTRATION

TECHNICAL-ECONOMICAL PROPOSAL FOR MEVA II AND REDDIG NETWORKS INTERCONNECTION

OPERATION OF COCESNA NODE AT REDDIG

September 2007

CONTENTS

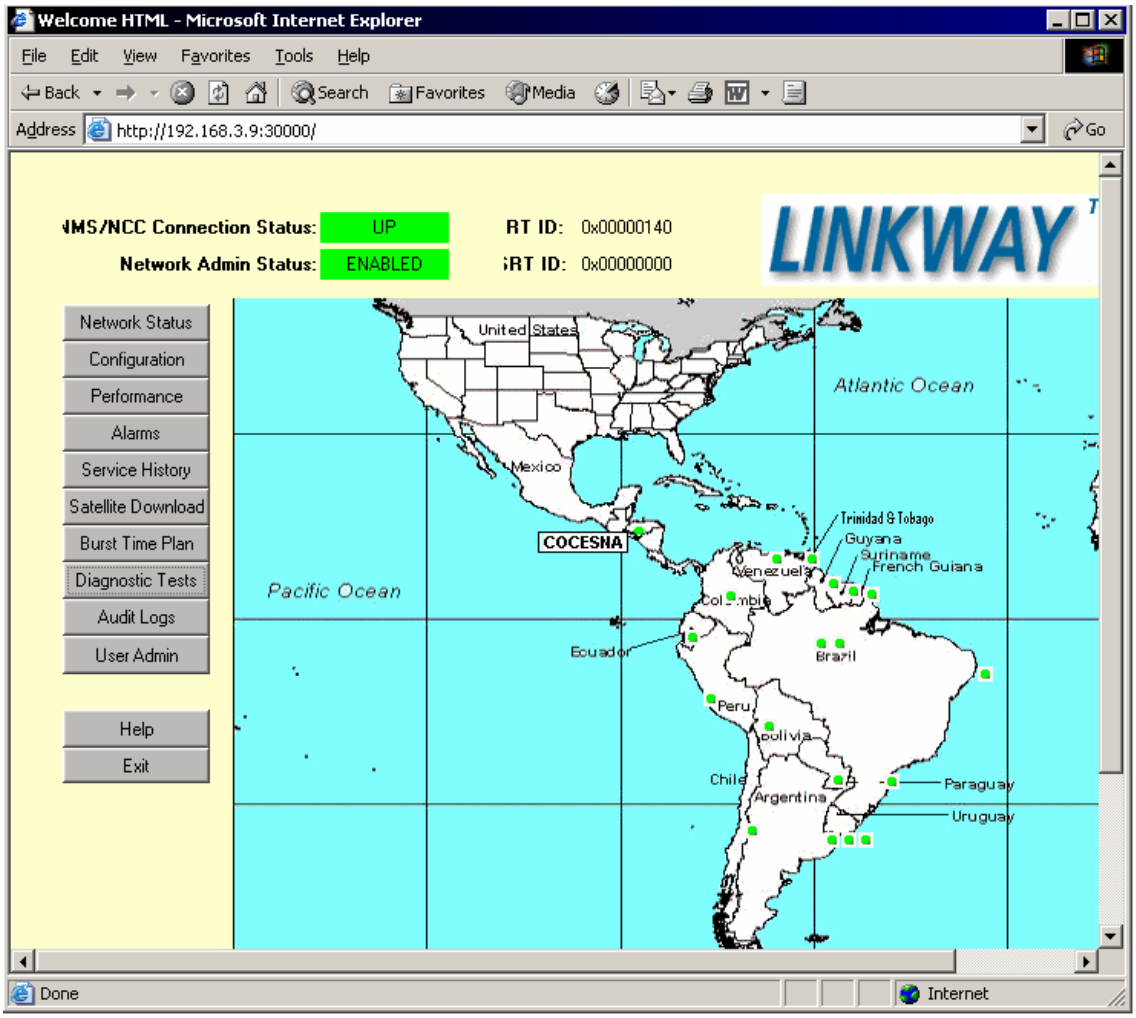
1. **PRESENTATION**

1.1 REDDIG administration, in representation of project RLA/03/901, presents its Technical-Economical Proposal for the operation of the MEVA II COCESNA node in the REDDIG network, meeting the RFP technical requirements with the highest availability, reliability and quality standards that REDDIG has been providing since 2003 to the aeronautical telecommunications services of thirteen South American States and one Caribbean State.

1.2 The REDDIG digital network is the result of the cooperation among participant States and those interested in having the objective of sharing an owned network that provides modern current and future aeronautical telecommunications services.

1.3 REDDIG administration, under ICAO RLA/03/901 Regional Technical Cooperation Project, manages a non-profit making integral operation of the network and administrates the corresponding satellite segment.

1.4 Below is a map indicating the REDDIG nodes being currently operated, and the future COCESNA node proposed.



2. TECHNICAL PROPOSAL

2.1 Executive summary

2.1.1 On the basis of the COCESNA node communications requirements for the interconnection of MEVA II / REDDIG networks and of the technical premises indicated in this proposal, the integral solution consists in the provision, installation and tests of the equipment described in paragraph 2.5.1.1, as well as the operation of the COCESNA node within REDDIG, from hereon COCESNA/REDDIG node, with the highest availability, reliability and quality standards of the services to be rendered by the network.

2.1.2 The solution presented takes into consideration the maximum use of the equipment currently available in the COCESNA/MEVA II. An additional Linkway 2100 modem will be used with the current RF chain, which is supported by the link budget analyses carried out to this effect. In addition, the slots available in the current FRAD equipment will be used to install additional cards that will support the COCESNA/REDDIG node communications channels.

2.1.3 In addition to the two ATS-exclusive voice channels, an on net administrative voice channel is included for the carrying out of tasks and maintenance coordinations, with the consequent savings in international long distance calls.

2.1.4 The installation of equipment in the node will be carried out in coordination with COCESNA and the MEVA II service provider, with the aim of reducing to a minimum the interruption period of its communications services. The satellite line up tests and the start up of the COCESNA/REDDIG node will be carried out under the coordination and supervision of the REDDIG Centre of Operations.

2.1.5 The COCESNA/REDDIG node will have all the technical facilities as REDDIG, such as 24x365 technical support from the Manaus-Brazil Centre of Operations, the geographical redundancy from the network's Master Reference Terminal, local redundancy from the NCCs from both Manaus-Brazil and Ezeiza-Argentina and, if required, the activation of the alternate Centre of Operations in Ezeiza.

2.1.6 Taking into consideration that all REDDIG nodes have redundant equipment configuration, providing the COCESNA/REDDIG node with greater communications availability with its counterpart nodes, the option of purchasing a Linkway 2100 modem as a spare equipment is presented, which would permit backing up any MEVA II or REDDIG modems, and thus improving the availability of the COCESNA node, in general.

2.2 Interconnection requirements at COCESNA node

2.2.1 In accordance to Table 3 in Appendix B to the RFP document, the communications requirements of COCESNA are:

(1) ATS voice channel with the Bogota, Colombia, control centre; and
(1) ATS voice channel with the Guayaquil, Ecuador, control centre.

2.3 Technical premises for the operation of the COCESNA node at REDDIG

a) That the COCESNA node operates on the IS-1R satellite, using C band transponders with US/Latin America hemisphere beam and co-lineal vertical polarization.

b) That the COCESNA node use a 3.8 m in diameter antenna with a 40 Watts and integrated BUC power amplifier.

c) That MEVA II network use carriers of up to 1.25Msym/s with QPSK modulation and 1/2 FEC.

d) That the Memotec CX-960e equipment in COCESNA be 100% interoperable with Memotec CX-950 equipment.

e) That the Memotec CX-960e equipment in COCESNA have slots available for the installation of additional cards to operate in REDDIG.

2.4 Solution design

The objective of the technical solution design is to maximize the use of the current equipment in the COCENA node, with the additional equipment necessary for the node to operate in REDDIG.

2.4.1 Use of the current RF chain with 40 Watts amplifier and LNB

2.4.1.1 To this end, the following satellite link budget calculations have been carried out from the COCESNA node station to:

- Manaus
- Bogota
- Guayaquil
- Miami
- Panama
- Kingston
- La Habana

2.4.1.2 ***Appendix A*** presents the referred link calculations.

2.4.1.3 Resultados obtained in each of the links:

Availability of compound link (UpLink + DnLink): **99.995%**
BER: **1xE-8**

2.4.1.4 Parameters used in the link calculations:

Satellite: IS-1R
Uplink Beam: US_LAM_CVUP; Uplink Pol: V; Uplink Channel: 3C
Dnlink Beam: US_LAM_CVDN; Dnlink Pol: V; Dnlink Channel: 4C
Symbol Rate: 1.25 Msps <> Info Rate: 1144 Kbps
Modulation: QPSK
Inner FEC: Viterbi 1/2
Outer FEC: RS (236,216)
Required C/N: 4.3dB
System Margin: 1.0dB

Analysis of the power consumption in the COCESNA node transmitter

2.4.1.5 The sum of the highest feed flange values in each network is 10.3 Watts (10.12 dBW) during both networks simultaneous operation.

2.4.1.6 *Considering*:

Transmitter power:	16.02dBW
Transmitter backoff for 2 carriers:	5dB (3dB minimum)
Loss from transmitter exit to feed flange:	0.5 dB

2.4.1.7 *You have*:

Power required for transmitter exit:	10.62 dBW
Transmitter available power:	11.02 dBW

2.4.1.8 *Therefore*:

The transmitter will be able to operate simultaneously with two carriers of up to 1.25Msym/s with QPSK modulation and 1/2 FEC.

2.4.2 **Provision of one (1) Linkway 2100 modem with one (1) ground frame relay protocol interface**

2.4.2.1 In the satellite segment, the Linkway 2100 model will operate in any of the three REDDIG carriers, 2x1.25Msps and 1x0.625Msps, with MF-TDMA (MultiFrequency-Time Division Multiple Access).

2.4.2.2 The REDDIG NCC will control, monitor and manage the satellite access, as well as dynamically assign the band width, on demand, to send the required traffic.

2.4.2.3 In the ground segment, the Linkway 2100 modem will support the PVCs required for voice communications with the Bogota and Guayaquil control centres and the REDDIG management and operations centre.

2.4.3 **Use of the currently installed Memotec CX-960e equipment**

2.4.3.1 In accordance with the information provided by COCESNA, cf. ***Appendix B,*** there are four slots available in the Memotec equipment for the installation of additional cards.

2.4.3.2 Slot # 3 will have installed one (1) V.35H card to be connected to the Linkway 2100 modem ground interface, to establish PVCs with the required destinations.

2.4.3.3 Slot # 6 will have installed two (2) voice channels with FXS interface for ATS operacional communications.

2.4.3.4 Slot # 5 will have installed one (1) voice channel with FXS interface for administrative/maintenance communications.

2.4.4 **Simultaneous operation of two (2) Linkway 2100 modem**

2.4.4.1 With the aim that the two Linkway 2100 modem (one in MEVA II and the other in REDDIG) simultaneously operate with an RF chain, and in the event there is unavailability of the AST4100 module in the node, two (2) L band combiners/dividers will be provided, one to combine the TX exits of the two Linkway 2100 modem towards the BUC/transmitter, and the other to divide the signal from the LNB towards the RX entries from the two Linkway 2100 modems.

2.4.5 **Performance of the loss of call probability**

2.4.5.1 *Premise*

Two (2) free channels are required to be always available for the 0.05 (5%) call loss probability at the COCESNA/REDDIG node ATS speech channels traffic flow.

2.4.5.2 *Considering*

a) That the network's peak hour traffic flow is estimated in 13.333 Erlangs;

b) That the network has 82 channels (traffic bursts) of 16 Kbps; and

c) That from the Traffic Flow and Loss Probability Table, *Appendix E*, it can be seen that 18 channels are required to support a 13.333 Erlangs traffic flow with a 0.05 (5%) call loss probability.

2.4.5.3 *Therefore*

The network will support at all times the two (2) additional channels in the node, under peak hour condition and with a 0.05 (%5) less or equal call loss probability.

2.5 Services

2.5.1 Implementation services

The COCESNA/REDDIG node implementation programme will comprise of the carrying out of the services until the COCESNA/REDDIG node activation, thenceforth automatically and transparently passing over to the operational service.

The implementation programme's schedule of activities will be presented 15 working days after the proposal's acceptance date.

2.5.1.1 *Equipment provision*

(1) One Linkway 2100 modem with AC feed source
(1) One ground serial interface with frame relay protocol
(1) One V.35 cable
(1) One V.35H Memotec card
(2) Two DAV Memotec cards
(3) Three FXS interfaces
(2) Two L band combiners/dividers
(1) One lot of coaxial cable, connectors and adapters

Optional: Recommended spare to improve node availability:

(1) One Linkway 2100 modem with AC feed source
(1) One ground serial interface with frame relay protocol

2.5.1.2 *Site survey*

Prior to the installation, a site survey will be carried out to complete the details necessary for the activation and operation of the COCESNA/REDDIG node.

In the event necessary and upon completion of this activity, the present technical-economical proposal could be reformulated.

2.5.1.3 *Equipment installation*

The installation of the equipment listed in paragraph 2.5.1.1 will be carried out through the implementation programme, in coordination with COCESNA and the MEVA II service provider, with the aim of reducing service interruption to a minimum.

2.5.1.4 *Satellite line up*

Satellite access tests and Linkway 2100 modem line up will be carried out, together with the current RF chain, to obtain the satellite downlink nominal power REDDIG has hired.

2.5.2 **Operation services**

REDDIG administration will provide the COCESNA/REDDIG node, 24H x 365D, the following services and facilities during the whole period of the contract. It is important to mention that the services and facilities which the COCENSA/REDDIG node will count with are the same as those currently being received by all REDDIG member States.

2.5.2.1 *Configuration*

a) COCESNA/REDDIG node configuration on the basis of REDDIG NCC data.

b) Memotec CX-960e equipment configuration with the proper features for the interconnection. ***To this end, either MEVA II service provider or COCESNA must provide the REDDIG administration with the Memotec CX-960e current configuration archive (.cxt).***

c) Configuration of the Guayaquil, Bogota, Manaus and Ezeiza nodes' Memotec CX-950 equipment with the proper features for the interconnection, and for administrative/maintenance purposes.

2.5.2.2 *End to end tests and COCESNA/REDDIG node activation*

In this final stage, simultaneous end to end tests will be carried out to the ATS voice channels, as to the administrative/maintenance voice channel. Upon satisfactory completion of the aforementioned, the COCESNA/REDDIG node will be declared activated, automatically passing to a nominal and continuous status of operation within REDDIG.

2.5.2.3 *Network access and satellite segment use*

REDDIG has three carriers, two of 1.25Msps and one of 0.625Msps, to process the traffic required by all nodes in the network. The COCESNA/REDDIG node will access, upon demand, any of the mentioned carriers.

2.5.2.4 *Network management and operation*

REDDIG has two NCCs (Network Control Center), one in Manaus, Brazil and the other in Ezeiza, Argentina, working only on NCC at a time. Each NCC has local redundancy, that is to say one operates on line and the other, on hot standby.

In addition, the network has MRT (Main Reference Terminal) geographical redundancy, one in Ezeiza and an AMRT (Alternate Main Reference Terminal) in Manaus, Brazil.

All this guarantees the continuous management and operation of the network for the provision of services to all its users.

It is important to mention that both NCCs use continuous uninterrupted power system (UPS), backed by automatic actioning redundant generators (1+1) in the event of outage of commercial power.

All this guarantees the network's continuous management and operation for the provision of services to users.

The REDDIG management centre will provide the node, on the basis of information available at the NCC, with band width use (outgoing traffic) monthly reports, availability (%) and performance (BER). In addition, in the event that failures occur in the node, they will be reported to the node's technical representative, through the application of the procedure established on failure follow-ups.

2.5.2.5 *Operational support*

REDDIG administration has a centre of operations located in Manaus, Brazil, which provides operational maintenance support to the REDDIG nodes, 24H x 365D.

This support includes, among other main activities, to preventively report the nodes of any anomaly detected by the NCC, receive calls from other nodes, carry out troubleshooting procedures, operational trials, coordinations and any tests necessary with the rest of the counterpart nodes, with the objective of keeping operational the node requiring the support.

Operational support has two levels to effectively attend to the nodes:

- The Operations Centre's operator; and
- The REDDIG administrator.

The above referred operational support contact numbers will be duly provided.

It is worth to mention that the REDDIG administrator also provides coordinate logistical support to the nodes' administrative representatives on activities regarding the repair/substitution of the node equipment, as applicable, by indicating the corresponding necessary procedures.

Also, if required, the REDDIG administrator could activate the alternate centre of operations in Ezeiza, Argentina.

3. ECONOMICAL PROPOSAL

3.1 Implementation services

3.1.1 The prices presented are those provided by the companies manufacturing the equipment and cards necessary for MEVA II / REDDIG interconnection. To these, a 10% percent was added, corresponding to the Administrative Overhead Service Charge (AOSC) of the ICAO Technical Cooperation Bureau Purchasing Section.

3.1.2 Equipment provision

(1) One Linkway 2100 modem with AC feeding source
(1) One ground serial interface with frame relay protocol
(1) One V.35 cable
(1) One V.35H Memotec card
(2) Two DAV Memotec cards
(3) Three FXS interfaces
(2) Two L band combiners/dividers
(1) One Lot of coaxial cable, connectors and adapters

Once only Value US$ = 20,401.70

3.1.3 Optional: Spare parts recommendation

(1) One Linkway 2100 modem with AC feeding source
(1) One ground serial interface with frame relay protocol

Once only Value US$ = 13,084.50

3.1.4 Complementary services

- site survey
- equipment installation
- satellite line up and link tests

Once only Value US$ = 6,509.80

Note: The proposal presents an overall implementation scheme by purchasing the equipment through RLA/03/901 project. COCESNA, if it so considers, can opt to implement by himself the services indicated ; nevertheless, the satellite line-up and link test must be implemented in coordination with REDDIG administration, as well as any other operations necessary for the start up.

3.2 Operational services

3.2.1 Prices presented for recurrent services are obtained on the basis of administrative costs necessary to maintain REDDIG, as well as the space segment cost. A 10%, corresponding to AOSC, has also been added to these prices.

3.2.2 Configuration, end to end tests and node activation

Once only Value US$ = 7,150.00

3.2.3 **Recurrent services**

a) Network access and satellite segment use
Monthly Value US$ = 389.40

b) Network management and operation
Monthly Value US$ = 924.00

c) Operational support
Monthly Value US$ = 286.00

3.2.4 **Total monthly recurrence** Value US$ 1,599.40

3.2.5 **Total annual recurrence** Value US$ 19,192.80

4. TERMS AND CONDITIONS

4.1 Currency

4.1.1 The prices are expressed in United States Dollars.

4.2 Manner of payment

a) Implementation services

100% of the value of the services – one time payment
15 days after the proposal's acceptance date

b) Operational services

b.1) 100% of the value of the services – one time payment
15 days after the proposal's acceptance date

b.2) 100% of the recurrent services total annual value
In advance to the activation of the COCESNA/REDDIG node and following the procedure adopted by the REDDIG administration under RLA/03/901 regional technical cooperation project.

Note: As REDDIG is operated and maintained under RLA/03/901 regional project, ICAO requires a 100% disbursement to cover services provision costs.

4.3 Operational services start up

4.3.1 This will be stipulated in the implementation programme.

4.4 Garantía del equipamiento

4.4.1 The equipment guarantee is of twelve (12) months against manufacturing defects. In the event any failure is diagnosed within this period in the equipment, the damaged equipment, or part thereof, will be sent to the respective manufacturing company for its repair and return to the node.

4.4.2 This proposal does not take into consideration the immediate replacement of any damaged equipment, or part thereof, during the period of its repair.

4.5 Responsibilities of COCESNA

a) COCESNA will be responsible for and assume all expenses due to the internment of the equipment in Honduras, as well as of its transfer to the node site.

b) The programming or configuration of the COCESNA central or voice switcher for the new voice channels subject to interconnection.

c) Provide the necessary support to REDDIG administration personnel, or to whomever REDDIG designates, for the site survey and installation.

d) During the guarantee period, COCESNA will only take care of exportation and transport costs of the damaged equipment, or part, to the manufacturing company.

e) Out of the guarantee period, COCESNA will cover all exportation, repair and re-importation costs, including transportation, of the damaged equipment, or part.

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APPENDIX C/APÉNDICE C

UPDATED ACTION PLAN FOR IMPLEMENTATION OF MEVA II AND REDDIG INTERCONNECTIONS
PLAN DE ACCIÓN ACTUALIZADO PARA LA IMPLANTACIÓN DE LAS INTERCONEXIONES MEVA II Y REDDIG

Date/Fecha: April/Abril2008

Item No.	Action / Acción	Responsible / Responsable	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
1	RFP Completion/Finalización del RFP	COCESNA	30-Apr-07	Completed / Finalizado
2	Required connections: / Conexiones requeridas: Aruba COCESNA Ecuador Colombia Peru Venezuela Brazil / Brasil Panama United States / Estados Unidos Jamaica Curacao / Curazao	MEVA II Service Provider and REDDIG Administration / Proveedor Servicio MEVA II y Administración REDDIG	30-Apr-07 / 30-Abr-07	Completed / Finalizado
3	Identification of Current Equipment / Identificación de Equipo Actual	MEVA II Service Provider and REDDIG Administration / Proveedor Servicio MEVA II y Administración REDDIG	28 Sep-07	Completed / Finalizado
4	Completion of SLA / Finalización de SLA	MEVA II Service Provider and REDDIG Administrator / Proveedor Servicio MEVA II y Administración REDDIG	30 Nov07	
5	Review of RFP / Revisión de RFP	MEVA II and REDDIG Members / Miembros MEVA II y REDDIG	29 June -07/ 29 Junio 07	The RFP was reviewed and approved by all MEVA II / REDDIG Member Administrations. / El RFP fue revisado y aprobado por todas las Administraciones miembros de las redes MEVA II y REDDIG.

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Item No.	Action / Acción		Responsible / Responsable	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2		3	4	5
6	Proposals response / Respuesta de propuestas		MEVA II Service Provider and REDDIG Administration / Proveedor Servicio MEVA II y Administración REDDIG	26 Sep.-07	The response for the RFP from the MEVA II Service Provider and REDDIG Administration was presented at the MR/5 Meeting/ Las respuestas al RFP por parte del Proveedor de Servicio MEVA II y la Administración de la REDDIG se presentó en la Reunión MR/5.
7	Proposals review / Revisión de propuestas		Coordination meeting / Reunión de coordinación	5 Oct.-07	The proposal was reviewed in the MR/5 Meeting. / La propuesta se revisó en la Reunión MR/5
8	Focal Point nomination / Nombramiento Punto Focal	Send a letter to MEVA II / REDDIG Member Administrations / Envio carta a las Administraciones miembros de las redes MEVA II y REDDIG.	ICAO Regional Offices / Oficinas Regionales OACI	15 Oct. 07	The ICAO Regional Offices sent to the States/Organization involved in the MEVAII REDDIG interconnection a letter in order to nominate focal points. Las oficinas regionales de la OACI enviaron una carta invitando los Estados/Organización involucrados en la interconexión la nominación de puntos focales .
		Focal point designation/ Designación punto focal	MEVA II and REDDIG Members involved / Miembros de MEVA II y REDDIG involucrados	30-Oct-07	All the States/Organization members of MEVA II and REDDIG network involved in the interconnection nominated focal points. Todos los Estados/Organización miembros de la REDDIG y MEVA II involucrados en la interconexión nominaron puntos focales

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Item No.	Action / Acción	Responsible / Responsable	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
9	Application of MoU reviewed / Aplicación del MoU revisado	MEVA II / REDDIG Member Administrations / Administraciones miembros de las redes MEVA II y REDDIG	30-Oct-07	The ICAO Regional Offices sent to the States/Organization of MEVA II and REDDIG network in order to sign the MoU reviewed.
10	Review and acceptance of equipment costs for the MEVA II / REDDIG interconnection by the REDDIG Member Administrations / Revisión y aceptación por parte de las Administraciones Miembros de la REDDIG sobre costo de equipamiento para la interconexión MEVA II / REDDIG	All the REDDIG Member States / Todos Estados miembros de REDDIG	30 Oct-07	No comments were received No se recibieron comentarios al respecto
11	Review and acceptance of equipment costs for the MEVA II / REDDIG interconnection by the MEVA II Member Administrations involved / Revisión y aceptación por parte de las Administraciones Miembros de la MEVA II involucradas sobre costo de equipamiento para la interconexión MEVA II / REDDIG	Aruba, Curaçao, Jamaica, Panama, USA (Miami and Puerto Rico) and COCESNA / Aruba, Curaçao, Jamaica Panamá, USA (Miami y Puerto Rico) y COCESNA	30 Oct -07	No comments were received No se recibieron comentarios al respecto
12	Review and acceptance of proposed recurrent costs for the MEVA II / REDDIG interconnection/ Revisión y aprobación costos recurrentes propuestos para la interconexión MEVA II REDDIG	MEVA II/ REDDIG Member Administrations involved / Administraciones Miembros de la MEVA II y REDDIG involucradas	30 Oct- 07	No comments were received No se recibieron comentarios al respecto
13	Revised MoU Signature / Firma del MoU Revisado	MEVA II and REDDIG Members / Miembros MEVA II y REDDIG	30 Nov 07	The following States sent the MoU reviewed signed Los siguientes Estados enviaron el MoU revisado firmado

Item No.	Action / Acción	Responsible / Responsable	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
14	Review, approval and signing of contracts or contract amendments to carry out the MEVA II / REDDIG interconnection presented by the MEVA II Service Provider / Revisión, aprobación y firma de los contratos o enmienda de los mismos para llevar a cabo la interconexión MEVA II/REDDIG presentada a través del Proveedor de Servicio de la MEVA II	MEVA II Member Administrations involved and REDDIG Administration / Administraciones Miembros de la MEVA II involucradas y Administración REDDIG	~~30 Nov 07~~/April 2008	The REDDIG members assigned REDDIG Administration the revision and signature of AGS contract. The ICAO Technical Cooperation after reviewed the AGS contract considered the necessity to separate the no recurrent and recurrent costs. The decision took long time from December 2007 to April 2008 For the no recurrent cost a bid it is necessary and the ICAO Technical Cooperation a bid process will make. For the recurrent cost they ask AGS to modify the contract in order to include only the no recurrent cost. Los miembros de la REDDIG asignaron a la Administración de la REDDIG la revisión y firma del contrato. La Cooperación Técnica de la OACI después de revisar el contrato de AGS consideró la necesidad de separar los costos recurrentes de los no recurrentes. La decisión fue tomada después de un largo periodo de diciembre de 2007 a abril de 2008 Para los costos recurrentes se procederá a un proceso de licitación publica y para los costos recurrentes se consideró que AGS modificara el contrato de forma tal que incluyera solamente los costos recurrentes.

Item No.	Action / Acción	Responsible / Responsable	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
15	To ensure that all MEVA II and REDDIG nodes work with IS-IR Satellite, using Band C transponder with US/Latin America hemispheric beam and Co-Linear Vertical polarization / Asegurar que todos los nodos de la MEVA II y REDDIG operen en el satélite IS-1R, empleando transpondedores de banda C con haz hemisférico US/Latin America y polarización co-lineal vertical.	MEVA II Service Provider and REDDIG Administration/ Proveedor Servicio MEVA II/Administración REDDIG	~~30 Nov-07~~ April 08/ Abril 08	No change of polarity was executed ,AGS is waiting the decision of the approval of the interconnection. No se ha efectuado todavía el cambio de polaridad , AGS esta esperando la aprobación de la interconexión.
16	Equipment and spare parts acquisition for MEVA II/REDDIG interconnection/ Adquisición de equipamiento y repuestos para la interconexión MEVA II / REDDIG.	REDDIG Administration and MEVA II involved Member Administrations / Administración de la REDDIG y Administraciones Miembros de la MEVA II involucradas	~~14 Dec 07/14 Dic 07~~ End of June 08/Fin de junio 08	The ICAO Technical Cooperation informed that the bid process for the acquisition of equipments through a bid process will take a duration of approximately two months. La Cooperación Técnica de la OACI informó que el proceso de licitación para la adquisición de los equipos durara dos meses aproximadamente.
17	Site survey/ Inspección sitio	MEVA II Service Provider and REDDIG Administration / Proveedor MEVA II y Administración REDDIG	~~15 Jan 08/15 Ene 08~~ End of July 08/Fin de Julio 08	
18	Site preparation for equipment installation for MEVA II / REDDIG interconnection / Preparación de los sitios para albergar equipamiento para la interconexión MEVA II / REDDIG	Colombia, Venezuela and/y COCESNA	~~30 Jan 08/30 Ene 08~~ Aug08/Ago08	
19	Delivery of purchased equipment at the required sites. / Entrega de equipamiento adquirido en los sitios requeridos	MEVA II Service Provider and REDDIG Administration / Proveedor de Servicio MEVA II y Administración REDDIG	~~15 Feb-08~~ Sep08	

Item No.	Action / Acción	Responsible / Responsable	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
20	Equipment installation / Instalación equipamiento	MEVA II Service Provider and REDDIG Administration / Proveedor de Servicio MEVA II y Administración REDDIG	~~14 Mar 08~~ Oct08	
21	Satellite line-up, configuration of site equipment and NCC for the interconnection/ Line-up satelital, configuración equipamiento en sitio y NCC para interconexión	MEVA II Service Provider and REDDIG Administration / Proveedor de Servicio MEVA II y Administración REDDIG	~~21 Mar 08~~ Oct08	
22	End-to-end trials for voice and data circuits / Pruebas de extremos a extremos para los circuitos de voz y datos	MEVAII Service Provider and REDDIG Administration / Proveedor de Servicio MEVA II y Administración REDDIG	~~27 Mar 08~~ Nov 08	
23	System Performance Evaluation / Evaluación de la performance del sistema	MEVA II Service Provider and REDDIG Administration / Proveedor de Servicio MEVA II y Administración REDDIG	~~25 Apr 08/25 Abr 08~~ Dec08/Dic08	
24	Service acceptance / Aceptación de los servicios /	MEVA II / REDDIG Member Administrations / Administraciones miembros de las redes MEVA II y REDDIG	~~30 Apr 08/30 Abr 08~~ Jan09/Ene09	
25	MEVA II / REDDIG Interconnection Implementation / Implantación de la interconexión MEVA II / REDDIG	MEVA II / REDDIG Member Administrations, MEVA II Service Provider and REDDIG Administrator / Administraciones miembros de las redes MEVA II y REDDIG, Proveedor Servicio MEVA II y Administración REDDIG	~~May 08/ Mayo 08~~ Feb09	

Legend / Leyenda:
MoU: Memorandum of Understanding / Memorando de Entendimiento
RFP: Request for Tecnical and Econmic Proposal / Solicitud de Propuestas Técnicas y Económicas
SLA: Service Level Agreement / Acuerdo de Nivel de Servicio