INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Regional Office

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

THIRTEENTH MEETING OF THE COORDINATION COMMITTEE (RCC/13)

(Lima, Peru, 9-10 March 2010)

Agenda Item 2: Report on Activities Performed in 2009

REPORT ON ACTIVITIES PERFORMED SINCE THE LAST MEETING OF THE COORDINATION COMMITTEE

(Presented by the Secretariat)

Summary
This working paper contains information on the activities carried out by the project since the last meeting of the REDDIG Coordination Committee, held on 9-10 March 2009.
Reference: Report of the twelfth meeting of REDDIG Coordination Committee (RCC12), Lima, Peru, 8–9 March, 2010

Strategic objective*:*	This working paper is related to Strategic Objective D.

1. Background

1.1 The main activities carried out since the last meeting of the REDDIG Coordination Committee, (RCC/12) on 9–10 March 2009, in addition to network operation, support, and maintenance, were as follows:

a) Follow-up on activities for the implementation of the MEVA II/REDDIG interconnection
b) 2009 Training Programme
c) Third REDDIG Technical-Operational Meeting (RTO/3)

d) Migration to the IS-14 satellite
e) Alternating operation of NCCs and the REDDIG management centre
f) Optimisation of REDDIG FRAD equipment and upgrading of NCC SUN servers.
g) Implementation of new services
h) Logistics and spare part management
i) Plan for total renewal of the REDDIG platform
j) Study on bandwidth increase

1.2 Also included as a relevant activity is the follow-up on actions concerning the establishment of the RMO.

2. **Description**

Follow-up on activities for the implementation of the MEVA II / REDDIG interconnection

2.1 On 25 March 2009, ICAO and Americom Government Services, Inc. (AGS), MEVA II service provider, signed contract N° 22500187 concerning the interconnection of the MEVA II and REDDIG satellite telecommunication networks.

2.2 The purpose of the contract is to address the activities concerning the MEVA II/REDDIG interconnection at the REDDIG nodes in Bogota and Caracas and the recurrent voice and data services for accessing the MEVA II network in Brazil, Colombia, Peru, and Venezuela. The duration of the contract is one year, to be extended for one year or more, without exceeding nine cumulative years following the initial lease period of one year. Likewise, prices specified in the contract for recurrent voice and data services shall remain unchanged for a period of 120 months, as of the date of activation of services in the interconnection.

2.3 AGS will be responsible for performing the following tasks:

a) On-site inspection of REDDIG nodes in Bogota and Caracas;
b) Installation of the equipment necessary for the interconnection in Bogota and Caracas;
c) Configuration of the MEVA II/REDDIG networks; and
d) Activation and commissioning of services foreseen in the interconnection.

2.4 The on-site inspection of REDDIG nodes in Bogota and Caracas was carried out from 28 April to 1 May 2009. Following the inspection at the AGS sites, they were considered ready to begin installation.

2.5 The circuits to be implemented in the MEVA II/REDDIG interconnection, determined from the study carried out by the MEVA II/REDDIG Task Force and the review performed during the MEVA II/REDDIG coordination meetings, are shown in **Appendix A** to this working paper.

2.6 Equipment and cards necessary for the MEVA II/REDDIG interconnection are shown in **Appendix B** to this working paper. ICAO procured the equipment and cards corresponding to the REDDIG nodes involved, as well as the equipment for the COCESNA node. AGS is responsible for purchasing the equipment and cards necessary for the interconnection at the MEVA II nodes, except for the COCESNA node.

2.7 After purchasing the equipment and cards for the Bogota and Caracas nodes, ICAO sent them to AGS for the corresponding pre-testing and subsequent delivery to the sites for installation. This procedure was established at the Fifth MEVA II/REDDIG Coordination Meeting (Lima, Peru, 7–8 May 2008) in the event REDDIG were to purchase the equipment and cards directly.

2.8 **Appendix C** to this working paper lists the focal points for purposes of coordinating the implementation of the MEVA II/REDDIG interconnection action plan. A**ppendix D** to this working paper shows the revised action plan, taking into the delays in the purchase of the Linkway 2100 MODEM, the administrative process involved in the delivery to AGS of the equipment and cards procured by ICAO for the Bogota and Caracas nodes and their subsequent delivery back to the aforementioned REDDIG nodes, and the activities concerning the change from the IS IR satellite to the IS 14 satellite by INTELSAT.

2.9 The works for the installation of the MEVA II/REDDIG interconnection at the Bogota and Caracas nodes began on 8 February 2010. Work was temporarily interrupted due to programming problems in the MEVA II MODEM, which did not match the remaining MEVA II nodes. According to the AGS revised action plan, installation would be completed by late March 2010.

2.10 The meeting took note that for the implementation and operation of the interconnection between the MEVA II COCESNA node and the REDDIG, ICAO and COCESNA had developed technical cooperation project RLA/09/901, which contained the technical, service, and financial aspects of the interconnection implementation, but it had not yet been signed. The delayed execution of this agreement between ICAO and COCESNA was mainly due to the fact that the legal department of ICAO was analysing this agreement. The REDDIG Administration sent COCESNA the action plan for the installation of the REDDIG MODEM at the MEVA II node in Tegucigalpa, Honduras. This action plan is contained in Annex E of this meeting. It is hoped that by the date of this meeting, COCESNA will have reviewed and approved said plan.

2009 training programme

2.11 Continuing with the Training Plan for REDDIG technical personnel, the RCC/12 meeting agreed to carry out in 2009 the course “Introduction to Satellite Communications and REDDIG Operation.” The programme for this course is shown in **Appendix F** to this working paper.

2.12 The REDDIG Administration deemed it advisable for the aforementioned course to be conducted twice, and thus scheduled one to be held in Suriname, in English, and the other to be held in Venezuela, in Spanish. The course in Suriname was successfully held at the Training Centre of Civil Aviation Suriname facilities in Paramaribo from 12-14 October, 2009. A summary of this course appears in **Appendix G** to this working paper. The course in Venezuela was successfully held at the Venezuela Hall of the Maiquetia International Airport Institute, Simón Bolívar International Airport, Maiquetia, Venezuela, on 19–21 October 2009. A summary of this course is shown in **Appendix H** to this working paper.

2.13 The total number of attendees, considering the two courses, was 54 delegates from Argentina, Bolivia, Brazil, Colombia, Ecuador, France, Guiana, Paraguay, Peru, Suriname, Trinidad & Tobago, and Venezuela. Moreover, 20 scholarships were given out to allow delegates to participate in the courses.

Third REDDIG Technical-Operational Meeting (RTO/3)

2.14 The RCC/12 meeting agreed to hold the third REDDIG Technical-Operational Meeting (RTO/3) together with and on the same week as the 2009 course. Since it had been deemed advisable to hold the course twice, the RTO/03 meeting was also scheduled to be held twice, following the respective courses in Suriname and Venezuela, respectively, and they would have the same work agenda. The RTO/03 meeting in Suriname was held in English at the 'Training Centre of Civil Aviation Suriname' facilities in Paramaribo on 15-16 October. The RTO/03 meeting in Venezuela was held in Spanish at the Venezuela Hall of the Maiquetia International Airport Institute, Simón Bolívar International Airport, Maiquetia, Venezuela, on 22-23 October 2009.

2.15 In total, considering the two meetings, 41 delegates from Argentina, Bolivia, Brazil, Colombia, Ecuador, France, Guiana, Paraguay, Peru, Suriname, Trinidad & Tobago, and Venezuela attended.

2.16 The consolidated RTO/03 meeting report appears in **Appendix I** to this working paper.

Migration to the IS-14 satellite

2.17 In early 2009, Intelsat informed that the IS-IR satellite being used by REDDIG would be replaced on the same orbital position by the IS-14 satellite, and that this change was scheduled for September 2009. On this regard, Intelsat also stated that it would provide the exact date and the procedure to be followed for the transition to the new satellite.

2.18 Intelsat rescheduled the date for the migration to the new satellite several times (15 November and 7 December). Finally on 30 November, Intelsat sent us a letter with the definitive date and time for the migration to the IS-14 satellite: 15 December at 06:45 UTC.

2.19 The two RTO/03 meetings discussed the migration to the new satellite and formulated recommendations in the event any type of mechanical adjustment of the antenna was needed at any of the network stations, and also recommended having available basic tools and utilities (power supply, telephone line, lighting) at the place where the antenna was located. Based on the information reported by Intelsat, no adjustments to the stations were anticipated, except for the main station (MRT), if any.

2.20 On the days before the migration, coordination was made with the technical representatives of all the REDDIG nodes, and letters were sent to the respective Administrations asking for support of the technical personnel so that they would be present at the time scheduled for the migration.

2.21 In turn, the REDDIG Administration conducted a comparative analysis of the 'Uplink G/T' and 'Downlink EIRP' values of the two satellites for all the network stations, and made EIRP adjustments to some remote stations.

2.22 The migration to the IS-14 satellite was carried out on the date and time scheduled by Intelsat without any problem, and seamlessly for the REDDIG operation. The IS-14 satellite transponder used by the REDDIG is A28CV/A28CV with AMCV/AMCV beam and V/V polarity.

2.23 Following the migration and once the IS-14 satellite was operational, the REDDIG Administration made offset frequency adjustments to some of the remote stations as a regular procedure.

2.24 Worth highlighting is the cooperation of the technical staff of all the REDDIG stations; they were present throughout the migration process, ready to respond to any possible problem.

Alternating operation of NCCs and Management Centres

2.25 Since the alternating operation of NCCs and Management Centres was a recommendation of the REDDIG Administration in order to maintain network redundancy, the RCC/12 meeting scheduled the operation of the NCC and the Management Centre from Argentina for the second half of 2009.

2.26 In February, due to a failure in the external clock subsystem (GPS time reference) of Manaus, the NCC (SUN equipment) of Ezeiza, Argentina, was put into operation. The Ezeiza NCC operated for eleven (11) weeks in a satisfactory manner until the end of April, when the Manaus NCC (SUN equipment) was operational once again. During the time the Ezeiza NCC was operating, the Management Centre remained in Manaus and continued to answer calls, offer specialised network support, and manage the network.

2.27 Taking into account the date (September) initially scheduled by Intelsat for the migration to the IS-14 satellite and the rescheduling of training courses and RTO/3 meetings to the month of October, the transfer of the Management Centre to Ezeiza was scheduled for November. However, since the migration was rescheduled twice and was finally done on 15 December, this transfer could not be completed in 2009.

Optimisation of the REDDIG FRAD equipment and upgrading of NCC SUN servers

Optimisation of REDDIG FRAD equipment

2.28 Since the manufacturing of the Memotec FRAD equipment, presently operating on the REDDIG, was discontinued on 31 July, 2009, according to the letter received from Memotec, the REDDIG Administration, in addition to purchasing spare parts, prepared, during the second semester of the year, a plan for the optimisation of the REDDIG FRAD equipment in stations where applicable.

2.29 The purpose of this optimisation is to use a single MPS FRAD equipment instead of two pieces of equipment (MUX + MPS) but keeping <u>all</u> the services offered in the node, in such a way that the operation with a single FRAD equipment is transparent to all users of the services. Likewise, the station maintains redundancy of the FRAD equipment and its corresponding M&C.

2.30 To this end, the REDDIG Administration analysed the current conditions of each of the network stations that used two FRAD pieces of equipment (MUX + MPS), and concluded that it was possible to carry out this optimisation in the following stations:

SBCT – Curitiba, Brazil
SBRF – Recife, Brazil
SCEL – Santiago, Chile
SGAS – Asuncion, Paraguay
SLLP – La Paz, Bolivia
SMPM – Paramaribo, Suriname
SOCA – Cayenne, French Guyana
SYGC – Georgetown, Guiana
TTZP – Piarco, Trinidad and Tobago

2.31 To date, FRAD equipment has been optimised and is operating satisfactorily in the following stations:

SBRF – Recife, Brazil
SGAS – Asuncion, Paraguay
SMPM – Paramaribo, Suriname
SYGC – Georgetown, Guiana

Optimisation of FRAD equipment in the other five stations will be completed in 2010.

2.32 The main benefit of this optimisation of FRAD equipment is that, once completed, each station will have spare parts on site: two (2) complete basic CX-950 units (in addition to the *motherboard*, power source, and ringer) and two (2) V.35H cards.

2.33 Likewise, from a global point of view and taking into account the spirit of cooperation existing among all of the REDDIG members, these optimisations would yield eighteen (18) basic CX-950 units, some of which, subject to administrative arrangements, could be used as spare parts for any of the REDDIG stations.

Upgrading of the NCC SUN servers

2.34 The hardware versions of the SUN equipment used as NCC servers since the onset of REDDIG operations, both in Ezeiza and Manaus, are SunBlade 100 and Ultra 5. The Ultra 5 equipment, although it properly executes the application programme, has to be rebooted on a monthly basis to continue operating. This is due to its technical features and specifications. The SunBlade 100 equipment belongs to a different hardware version and thus does not require rebooting.

2.35 In late 2008, the REDDIG Administration coordinated with each of the technical areas of the Argentine and Brazilian Administrations to determine whether or not it was possible to obtain SUN equipment (with a better hardware version than that of the Ultra5 equipment), as a loan, for use as NCC servers.

2.36 Both Argentina and Brazil answered promptly and positively and made the corresponding internal coordination. Each Administration has made available to the REDDIG Administration one (1) SunBlade 150 unit on loan.

2.10 The REDDIG Administration fully installed the Unix SUN Solaris8 operating system on both units, in Manaus and Ezeiza, with the corresponding patches and the LINKWAY NCC application. The equipment in Ezeiza was configured at the end of 2008 while the Management Centre was temporarily in Ezeiza.

2.37 After preliminary testing, on 27 April 2009, the SunBlade 150 equipment was commissioned at the Manaus NCC and has been operating satisfactorily non-stop since then. The SunBlade 100 stands as the local ‘hot stand-by’ redundant NCC equipment.

2.38 The SunBlade 150 located in Ezeiza first needs to be tested off-line and then commissioned as NCC in 2010, when the Management Centre is temporarily moved to Ezeiza during the period o falternating operation of the NCCs.

2.39 It is suggested that the Administrations of Argentina and Brazil appraise the respective SunBlade 150 units so that Project RLA/03/901 may acquire them in 2010, with the most convenient administrative arrangements for all of the parties.

Implementation of new services

Implementation of a back-up network at the Piarco node (Trinidad and Tobago)

2.40 In April 2009, the REDDIG Administration implemented the back-up network, through the ISDN international circuit, for the Piarco TTZP station, in Trinidad and Tobago. To this end, new PVC virtual circuits were created in the satellite network, as well as in the FRAD equipment of the TTZP station and in the FRAD equipment of the TTPZ station, and in those of its counterparts, SOCA, SMPM, SYGC, and SVMI. Also, new PVC virtual circuits were created in the FRAD equipment of the SPIM station in Lima, Peru, which serves as standby only when the back-up network is activated through ISDN, for communications to/from the TTZP station and its counterparts. The REDDIG Administration implemented the back-up network through the ISDN circuit at the REDDIG station in Piarco at no cost to the Trinidad and Tobago Civil Aviation Authority.

Implementation of circuits for AMHS service

2.41 In addition to the circuits previously created in the REDDIG between Argentina-Brazil, Argentina-Paraguay, and Argentina-Peru for AMHS service, the following new PVC virtual circuits have been created with a view to the implementation of this service among the States of the region that currently have AMHS systems:

Colombia - Peru
End-to-end connectivity and message exchange tests were successfully performed in November.

Chile – Peru
End-to-end connectivity tests to be performed.

2.42 Likewise, upon request of Argentina, a new PVC virtual circuit has been created, with the respective configurations in the FRAD equipment, for the exchange of radar data (using IP protocol) between:

Argentina - Uruguay
End-to-end connectivity tests to be performed.

Logistics and spare part management

2.43 Logistics, mainly activated by equipment failures, entails the delivery of equipment or parts from the REDDIG spare part stock in the warehouse located at the Lima Regional Office or from any other node to the nodes that require them; coordinating with the manufacturers for the repair of the equipment; payment for transportation of equipment or parts; payment to manufacturers for repair of equipment; coordinating with and supporting the States for the import/export of the equipment and parts needed at the nodes. This support also includes the purchase and transportation of equipment on behalf of the States for their corresponding Nodes.

2.44 In 2009, twenty-four logistics operations were conducted.

Summary of equipment and part failures:

FRAD Manufacturer: Memotec

(1)	Power Supply Module	: (1) SLLP
(4)	Universal I/O Card	: (1) SAEZ, (2) SBMN, (1) SKED
(2)	Motherboard CX950	: (1) SGAS, (1) SAEZ
(1)	E&M SLIM Card	: (1) SVMI
(3)	FXS SLIM Card	: (3) SYGC
(1)	DAV Card	: (1) SBRF
(4)	Internal Fan	: (2) SBMN, (2) SAEZ

MODEM Manufacturer: ViaSat

(13)	Quad Output P.S.	: (2) SPIM, (2) SEGU, (3) SKED, (2) SCEL, (1) SBRF (1) SGAS, (1) SOCA, (1) SVMI
(1)	Terminal LW2100	: (1) SUMU

SSPA Manufacturer: Paradise Datacom

(2)	SSPA M&C	: (1) SBMN (1) ADM

Others - REDDIG

(1)	Time Reference GPS	: (1) SBMN
(1)	I/O Card PC Linux	: (1) SCEL

2.45 **Appendix J** to this working paper shows the statistics for 2009 on the numbers of the main repairs of network nodes as well as their distribution in terms of type of equipment requiring the service.

2.46 An important aspect worth mentioning is that, thanks to the level of failure diagnosis available to the REDDIG Administration, a failure in one of the power supply sources of the Linkway2100 MODEM equipment was identified. Accordingly, spare parts were purchased as a preventive measure, and the broken equipment could be quickly repaired and put back into operation, thus attaining significant savings, since there was no need to send the equipment to the manufacturer for this type of repair.

Plan for total renewal of the REDDIG platform

2.47 For the reasons explained at the RCC/12 meeting, the REDDIG Administration recommended fully changing the technology underlying the REDDIG equipment within three years.

2.48 Accordingly, the meeting formulated Conclusion RCC 12/1, asking the REDDIG Administration to prepare a plan to fully change the technology currently used in REDDIG equipment. The REDDIG Administration was asked to present the plan at the RCC/13 meeting.

2.49 The REDDIG Administration has prepared a plan that is presented to this meeting as WP/7.

Study on bandwidth increase

2.50 WP/8 of this meeting shows the study conducted by the *Ad-hoc* group made up by Argentina, Brazil, and the REDDIG Administration to analyse the bandwidth increase required, taking into account the implementation of new services pursuant to Conclusion RCC 12/2 (*Study on the need to increase the bandwidth for REDDIG).*

Follow-up on activities related to the establishment of the RMO

2.51 As follow-up on the activities for the establishment of the RMO, a Diplomatic Conference convened by ICAO at the request of the eleventh Meeting of Civil Aviation Authorities (RAAC 11, Santiago de Chile, May 2009) pursuant to Conclusion 11/3 of said meeting, was held in Brasilia on 7-9 December 2009.

2.52 As a result of its discussions, the Conference adopted the text of the *Agreement for the Establishment of the South American Air Navigation and Safety Organisation* (replaces the RMO) and, by consensus, adopted the following resolutions:

Resolution 1: Regarding the encouragement to the States to sign and ratify the Agreement for the Establishment of the South American Air Navigation and Safety Organisation

It resolves: To invite ICAO SAM States to sign and ratify as soon as possible the Agreement for the Establishment of the South American Air Navigation and Safety Organisation, adopted on 9 December 2009, in Brasilia, and to deposit the ratification instruments with the International Civil Aviation Organization (ICAO), pursuant to Article 20 of said Agreement; *and invite* the Secretary General of ICAO to immediately bring this resolution to the attention of the States of the ICAO South American Region in order to achieve the aforementioned objective.

Resolution 2: Regarding the establishment of the headquarters of the South American Air Navigation and Safety Organisation

It resolves: to invite the States in the ICAO South American Region to submit proposals to the South American Regional Office, pursuant to Article 6 of the Agreement, in order to define the headquarters for the Organisation; and

Resolution 3: Regarding ICAO assistance for expediting the implementation of the South American Air Navigation and Safety Organisation

It resolves: to invite the States in the ICAO South American Region to coordinate with the South American Regional Office, as soon as possible, the establishment of a technical cooperation project for the implementation of the South American Air Navigation and Safety Organisation.

2.53 The Agreement for the Establishment of the South American Air Navigation and Safety Organisation, which was signed at the end of the conference by Chile, Paraguay, and Uruguay, will be available for signing by the other ICAO SAM States at the Ministry of Foreign Affairs of Brazil until 30 June 2010, and, after that date, at ICAO Headquarters until it becomes effective. In this sense, the remaining SAM States are expected to sign their acceptance of the Agreement and establish the headquarters of the South American Air Navigation and Safety Organisation by the end of 2010, so that the Organisation may start its activities in early 2011. In order for the Organisation to begin its operations, at least five States must have signed. Until such time that the South American Air Navigation and Safety Organisation starts its operations, it will continue to be managed by ICAO.

3 Suggested action

3.1 The Meeting is invited to:

a) Take note of the information provided;

b) Analyse the activities carried out since the RCC12 meeting, as shown in the corresponding section and appendices, and formulate recommendations on this regard; and

c) Analyse any other consideration that the Meeting may deem appropriate in connection with this matter.

APPENDIX A/APENDICE A

COMMUNICATIONS SERVICES REQUIREMENTS FOR MEVA II / REDDIG INTERCONNECTION/ REQUERIMIENTOS DE SERVICIOS DE COMUNICACIONES PARA LA INTERCONEXION MEVAII / REDDIG

Table 1 – CAR/SAM AFS interconnection requirements in the Caracas, Venezuela REDDIG node/ Requerimientos SFA en la interconexión CAR/SAM en el nodo REDDIG de Caracas, Venezuela

No.	Requirement CAR/SAM	Required AFS Circuits/Circuito SFA requerido	Remarks/ observaciones
1	2	3	4
1	Curaçao / Caracas (Venezuela)	1 ATS voice– A 1 AFTN data, 2400 bps, X25, IA-5*	
2	Aruba / Josefa Camejo (Venezuela)	1 ATS voice – A	Conexión Caracas-Josefa Camejo via circuito terrestre dedicado/Connecti on between Caracas Josefa Camejo through ground terrestrial network
3	Puerto Rico (USA) / Caracas (Venezuela)	1 ATS voice – A 1 AFTN data, 2400 bps, X25, IA-5	

A: Indicates ATS requirements for voice communications which should be established in 15 seconds.
A: Indica requerimientos ATS para comunicaciones de voz que deberían establecerse en 15 segundos .
* Nuevo requerimiento de datos AFTN no reflejada en Tabla CNS 1A del ANP CAR/SAM.

Table 2 - CAR/SAM AFS interconnection requirements in the Bogota, Colombia REDDIG node/ Requerimientos SFA en la interconexión CAR/SAM en el nodo REDDIG de Bogotá , Colombia

No.	Requirement CAR/SAM	Required AFS Circuits/ Circuito SFA requerido	Remarks/ observaciones
1	2	3	4
1	Barranquilla (Colombia)/Curaçao*	1 ATS voice – A	Conexión Bogotá-Barranquilla a través de red VSAT Colombiana/Connection Bogota Barranquilla through Colombian VSAT network
2	Barranquilla (Colombia)/Jamaica*	1 ATS voice – A	Conexión Bogotá-Barranquilla a través de red VSAT Colombiana/ Connection Bogota Barranquilla through Colombian VSAT network
3	Bogota (Colombia)/Panama	1 AFTN data, 2400 bps, X25,	Panama has two terminals of

*

No.	Requirement CAR/SAM	Required AFS Circuits/ Circuito SFA requerido	Remarks/ observaciones
1	2	3	4
		IA-5	the Harris 2020 ATS speech circuit switching centre installed in Bogota. Panamá tiene dos terminales de la central de conmutación de circuitos orales ATS Harris 2020 instalada en Bogotá A través de la conexión MEVA II REDDIG entre Colombia y Panamá se instalaran 3 circuitos orales ATS y un circuito AFTN / Through the MEVAII REDDIG connection between Colombia and Panama three ATS oral circuits and one AFTN will be implemented. Las conexiones entre Cali, Medellín y San Andrés con Bogota son a través de la red VSAT colombiana/ The connections between Cali,Medellin and San Andres are through VSAT Colombian network.
	Barranquilla (Colombia) / Panama*	1 ATS voice – A	
	Bogota (Colombia) / Panama*	1 ATS voice – A	
	Cali (Colombia)/ Panama*	1 ATS voice – A	
	Medellin(Colombia) / Panama*	1 ATS voice – A	
	San Andrés (Colombia)/ Panama*	1 ATS voice – D	
4	Lima (Peru) / Miami (United States)	1 AFTN data, 2400 bps, X25, IA-5 *	Conexion Lima a Bogota a traves de la REDDIG
5	Miami (United States) / Brasilia (Brazil)	1 AFTN data, 2400 bps, X25, IA-5*	Conexion Brasilia a Manaos via TELESAT (Red VSAT Brasil) Manaos Bogotá via REDDIG/ Connection Brasilia Manaos through TELESAT (Brazilian VSAT network) Manaos Bogota through REDDIG network

D: Indicates requirements for instantaneous communications/Indica requerimientos para comunicaciones instantaneas

A: Indicates ATS requirements for voice communications which should be established in 15 seconds. / A: Indica requerimientos ATS para comunicaciones de voz que deberían establecerse en 15 segundos

Table 3 – CAR/SAM AFS interconnection requirements in the Tegucigalpa, COCESNA MEVA II node/ Requerimientos SFA en la interconexión CAR/SAM en el nodo MEVA II de Tegucigalpa , COCESNA

No.	Requirement CAR/SAM	Required AFS Circuits/ Circuito SFA requerido	Remarks/Observaciones
1	2	3	4
1	Cenamer (COCESNA)/ Bogota (Colombia)	1 ATS voice– A	
2	Cenamer (COCESNA)/ Guayaquil (Ecuador)	1 ATS voice – A	

A: Indicates ATS requirements for voice communications which should be established in 15 seconds.
/ A: Indica requerimientos ATS para comunicaciones de voz que deberían establecerse en 15 segundos

Table 4 – Corresponding Implementations due to Interconnection in the MEVA II nodes of Curacao, Kingston, Miami, San Juan and Panama and REDDIG nodes of Guayaquil, Lima and Brasilia/ Implantaciones correspondientes por la interconexión en los nodos MEVA II de Curazao,Kingston, Miami, San Juan y Panamá y en los nodos REDDIG de Guayaquil, Lima y Brasilia.

No.	MEVA II/ REDDIG Nodes	Required AFS Circuits/ Circuito SFA requerido	Remarks/Observaciones
1	2	3	4
1	Aruba, Aruba	1 ATS voice– A	Circuits with Josefa Camejo, Venezuela
2	Curacao, Netherlands Antilles	1 ATS voice – A 1 AFTN data	Circuits with Venezuela
		1 ATS voice – A	Circuit with Colombia
3	Kingston, Jamaica	1 ATS voice – A	Circuits with Colombia
4	Miami, United States	2 AFTN data *	Circuits with Brazil and Peru through Colombia
5	Panama, Panama	2 ATS voice – A 1 AFTN data	Circuits with Colombia
6	San Juan, Puerto Rico	1 ATS voice – A 1 AFTN data	Circuits with Venezuela
7	Guayaquil, Ecuador	1 ATS voice – A	Circuit with COCESNA
8	Brasilia, Brazil	1 AFTN data *	Circuit with United States through Colombia
9	Lima, Peru	1 AFTN data *	Circuit with United States through Colombia

A: Indicates ATS requirements for voice communications which should be established in 15 seconds. / A: Indica requerimientos ATS para comunicaciones de voz que deberían establecerse en 15 segundos

* 9.6Kbps AFTN circuit.

APENDICE B / APPENDIX B

LISTA DE EQUIPAMIENTO PARA LA INTERCONEXION / LIST OF EQUIPMENT REQUIRED FOR THE INTERCONNECTION

LOCALIDAD / LOCATION	EQUIPO ADICIONAL/PARTES REQUERIDAS / ADDITIONAL EQUIPMENT/PARTS NEEDED	CANTIDAD / QUANTITY
COCESNA/Tegucigalpa Honduras	ViaSAT Linkway 2100 with frame-relay card and V.35 cable	1
	2-port L-band Splitter (1 port with DC block)	2
	2-port L-band Combiner (1 port with DC block)	2
Curacao	Memotec V.24 Card	1
Caracas	ViaSat Linkway 2100 with frame-relay card and V.35 cable	1
	Memotec DAV Card *(2 for MUX A, 2 for MUX B)*	4
	Memotec FXS SLIM LID *(3 for MUX A, 3 for MUX B)*	6
	2-port L-band Splitter (1 port with DC block)	3
	2-port L-band Combiner (1 port with DC block)	3
	Paradise Datacom , Standard C-Band 75W SSPA , Internal BUC with 10 MHz External Reference with M&C Software fully compatible with 38400 BAUD with binary protocol	2
Bogota	ViaSat , Linkway 2100 with frame-relay card and V.35 cable	1
	Memotec DVP2 E1 Daughter Card (1 for MPS A, and 1 for MPS B*)*	2
	2-port L-band Splitter (1 port with DC block)	3
	2-port L-band Combiner (1 port with DC block)	3
Jamaica and Aruba	No Additional HW required.	1
Miami	Memotec 960e Chassis	1
	Memotec 960e CPU	1
	Memotec 960e Power Supply	1
	Universal I/O	1
Panama	Memotec DAV Card	1
San Juan	Memotec Multi I/O card	1
Ecuador	Memotec DVP2 E-1 Daughter Card (1 for MPS A, 1 for MPS B)	2

- - - - - -

APÉNDICE C/APPENDIX C

PUNTOS FOCALES PARA COORDINAR LA IMPLANTACIÓN DEL PLAN DE ACCIÓN PARA LA INTERCONEXIÓN MEVA II/REDDIG

FOCAL POINTS FOR COORDINATING THE IMPLEMENTATION OF THE ACTION PLAN FOR MEVA II/REDDIG INTERCONNECTION

ESTADO ORG./ STATE ORG.	NOMBRE-TITULO/ NAME-TITLE	DATOS DE CONTACTO/ CONTACT INFORMATION
BRASIL/ BRAZIL	**Athayde Licerio Viera Frauche** Coordinador de la REDDIG/REDDIG Coordinator	DECEA Av. General Justo 160 Castelo, Rio de Janeiro, Brasil Tel +55 21 21016584 Fax +55 21 21016219 Email dcte5@decea.gov.br
	Jorge Mauricio Motta Coordinador Técnico REDDIG/REDDIG Techanical Coordinator	CINDACTA IV Av. Do Turismo sin Taruma Manaus – AM, Brasil Tel +55 92 36525536 Fax +55 92 36525501 Email mauriciojmm@cindacta4.decea.gov.br
	Alessandro Stefson Mamede Alves Coordiador Técnico REDDIG/REDDIG Technical Coordinator	CINDACTA IV Av. Do Turismo sin Taruma Manaus – AM, Brasil Tel +55 92 36525470 Fax +55 92 36525501 Email ttaa@cindacta4.decea.gov.br
COLOMBIA	**Sergio Paris** Asesor del Director de la UAEAC/ UAEAC Director Adviser	Unidad Administrativa Especial de Aeronáutica Civil - UAEAC Dirección Telecomunicaciones Aeropuerto Internacional El Dorado Tel +57 1 2663672 Fax +57 1 2223486
ECUADOR	**Raúl Avellán Oña** Asuntos técnicos:/Technical matter	Aeropuerto José Joaquín Olmedo Guayaquil, Ecuador Tel +593 42 692829 Cel +593 84 362441 REDDIG 2308 / 2309 Email ravellan1@yahoo.com
	Aida Justina Moreno Gómez Jefe Comunicaciones Satelitales RI – Asuntos Administrativos/Chief RI satellite communications	Dirección General de Aviación Civil Cerro Mojas, Edificio Servicio para la Navegación Aérea Quito, Ecuador Tel. + 593 260 1434 Fax + 593 260 1434 E-mail aida_moreno@dgac.gov.ec; aidamg@hotmail.com
PERÚ/PERU	**José Luis Paredes Dávila**	CORPAC S.A. Tel +51 1 708 1196 Cel +51 1 99582 5997 Email jlparedes@corpac.gob.pe

ESTADO ORG./ STATE ORG.	NOMBRE-TITULO/ NAME-TITLE	DATOS DE CONTACTO/ CONTACT INFORMATION
VENEZUELA	**Luis E. Escobar** Jefe Telecomunicaciones Aeropuerto Maiquetía/Chief Telecommunications, Maiquetia Airport **Wilton R. Linarez** Gerente General de la Oficina de Tecnología de la Información "OTI"/ General Manager Information Technology Office	Aeropuerto Simón Bolívar, Edif. ATC, Piso 2 Maiquetía, Venezuela Tel +58 212 3552143 Fax +58 212 3551412 Mail scoguil5@cantv.net l.escobar@inac.gob.ve Instituto Nacional de Aeronáutica Civil (INAC) Altamira Sur, Torre Británica, Piso 2 Caracas, Venezuela Tel +58 212 2774403 Fax +58 212 2774403 E-mail w.linarez@inac.gob.ve
COCESNA	**Roger Perez** Gerente Estación Honduras /Honduras General Manager	COCESNA Apartado Postal No. 660 Tegucigalpa, D. C., Honduras, C. A. Tel + 504 234 3360 ext. 1461 Fax + 504 234 3682 E-mail rperez@cocesna.org

– – – – – – – – – – – – – – – –

APPENDIX D / APENDICE D

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: February/Febrero 2010

Item No.	Action / Acción	Responsible / Responsible	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

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

D2

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
4	Completion of SLA / Finalización de SLA	MEVA II Service Provider and REDDIG Administrator / Proveedor Servicio MEVA II y Administración REDDIG	25Mar-09	Completed/Finalizado El 25 de marzo de 2009 entre la OACI y el Proveedor de servicio de la MEVA II se firma del contrato para la implantación de la interconexión MEVA II REDDIG/ The 25 March 2009 between ICAO and MEVA II Communications service provider is signed the contract for the implementation of MEVA II REDDIG
5	Review of RFP / Revisión de RFP	MEVA II and REDDIG Members / Miembros MEVA II y REDDIG	29 June -07/ 29 Junio 07	Completed / Finalizado 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.
6	Proposals response / Respuesta de propuestas	MEVA II Service Provider and REDDIG Administration / Proveedor Servicio MEVA II y Administración REDDIG	26 Sep.-07	Completed / Finalizado 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 presentaron en la Reunión MR/5.
7	Proposals review / Revisión de propuestas	Coordination meeting / Reunión de coordinación	5 Oct.-07	Completed / Finalizado The proposal was reviewed in the MR/5 Meeting. / La propuesta se revisó en la Reunión MR/5.

Item No.	Action / Acción		Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2		3	4	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	Completed / Finalizado 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	Completed / Finalizado 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.
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	Completed / Finalizado States/Organization members of MEVA II REDDIG reviewed the MoU application Los Estados/Organizaciones miembros de la MEVA II y REDDIG revisaron la aplicación del MoU

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

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
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	Completed / Finalizado 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	Completed / Finalizado 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	Completed / Finalizado 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	Completed / Finalizado All the States REDDIG members signed the MoU reviewed. For MEVA II only Cuba, COCESNA and United States signed the MoU the rest of MEVA II States informed that they have reviewed and accepted the MoU Todos los Estados miembros de la REDDIG firmaron el MoU revisado . Para la MEVAII solamente Cuba, COCESNA y Estados Unidos firmaron el MoU el resto de los Estados miembros de la MEVA II informaron que habían revisado y aceptado el MoU revisado .

Item No.	Action / Acción	Responsible / Responsible	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	25 Mar 2009	Completed/Finalizado The 25 March 2009 between ICAO and MEVA II communication service provider is signed the contract to carry out the MEVA II REDDIG interconnection. El 25 de marzo de 2009 se firma el contrato entre la OACI y el proveedor de servicios de comunicaciones de la MEVA II para llevar a cabo la interconexión MEVAII REDDIG

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

Item No.	Action / Acción	Responsible / Responsible	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	Nov -08	Completed / Finalizado In the month of November 2008 AGS proceeded to change the polarity from horizontal to vertical of the MEVA II nodes. With this implementation all the preliminary requirements for the interconnection were satisfied. En el mes de noviembre de 2008 AGS procedió a la implantación del cambio de polaridad de horizontal a vertical de los nodos de la MEVA II. Con esta implantación todos los requerimientos preliminares para la interconexión MEVAII REDDIG están satisfechos.

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
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	Mar- 09	Completed/Completado ICAO acquired the equipments and cards required for REDDIG nodes involved in the MEVA REDDIG interconnection. Also acquired the equipments for the COCESNA MEVA II node. The rest of the States of MEVA II involved in the interconnection acquired the equipments and cards trough MEVA II service provider. OACI adquirió los equipos y tarjetas requeridas para la interconexión MEVA II REDDIG en los nodos REDDIG involucrados. También adquirió los equipos para el nodo MEVA II de COCESNA. El resto de los Estados MEVA II involucrados en la interconexión adquirió los equipos y tarjetas a través del proveedor de servicio de MEVA II

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

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
	Site survey for Bogota, Caracas , / Inspección sitio para Bogotá, Caracas,	MEVA II Service Provider / Proveedor MEVA II y	Mayo - 09	Completed/Completada From 27 to 1 May 2009 AGS completed the Site Survey in the REDDIG nodes of Bogotá and Caracas. Desde el 27 al 1 de mayo de 2009 AGS completo la inspección en sitio en los nodos REDDIG de Bogotá y Caracas..
17	Site Survey for Tegucigalpa Honduras	REDDIG Administration/ Administración REDDIG	April - 2010	The site survey in COCESNA MEVAII node will be made once the ICAO COCESNA project for MEVA II REDDIG interconnection will be signed (end of March 2010) La inspección en sitio en el nodo MEVAII de COCESNA se realizara una vez que se firme el proyecto entre la OACI y COCESNA para la interconexión MEVAII REDDIG (Finales de marzo de 2010)

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
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	Jun-09	Completed /Completado

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

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
		MEVA II Service Provider /Proveedor de Servicio MEVA II	Jul-09	Completed/ Completado The equipments necessary for the MEVA II REDDIG interconnection in REDDIG nodes were acquired by ICAO , reviewed by MEVA II service provider and delivered to the REDDIG nodes involved in the MEVA II REDDIG interconnection The equipments for MEVA II nodes involved in the interconnection except COCESNA were acquired and delivered by MEVA II service provider to the respective nodes. Los equipos para la interconexión MEVA II REDDIG en los nodos REDDIG fueron adquiridos por OACI, revisados por el proveedor de servicio de MEVA II y enviados a los nodos REDDIG involucrados en la interconexión MEVAII REDDIG . Los equipos para los nodos MEVA II involucrados en la interconexión excepto COCESNA fueron adquiridos y entregados por el proveedor de servicio MEVA II a los respectivos nodos.
19	Delivery of purchased equipment at the required sites. / Entrega de equipamiento adquirido en los sitios requeridos	REDDIG Administration / Administración REDDIG	Apr/Abr-2010	The equipments for COCESNA MEVAII node was acquired and reviewed by REDDIG Administration. The equipments will be delivered to COCESNA once the ICAO and COCESNA signs the project for the interconnection of COCESNA MEVA II node with REDDIG. Los equipos para el nodo MEVAII de COCESNA fueron adquiridos y revisados por la administración de la REDDIG . Los equipos serán entregados a COCESNA una vez que entre la OACI y COCESNA se firme el proyecto de interconexión del nodo MEVAII de COCESNA con la REDDIG

Item No.	Action / Acción	Responsible / Responsible	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	March 2010 Apr/Abr-2010	MEVAII service provider started the interconnection works in Bogota REDDIG node the 15th February 2010.The installation work was interrupted due software problem configuration in the MEVAII MODEM At this respect MEVAII service provider re-programmed the installation date for the first week of March 2010. El proveedor de servicio MEVA II inicio los trabajos de interconexión en el nodo REDDIG de Bogotá el 15 de febrero de 2010. Los trabajos de instalación se interrumpieron debido a que el MODEM MEVA II a instalarse en Bogotá presentaba problemas de configuración de software. A este respecto el proveedor de servicio MEVA II re programo la fecha de instalación para la primera semana de marzo de 2010. The equipments installation in COCESNA MEVA II network will be made once the once the ICAO COCESNA project for MEVA II REDDIG interconnection will be signed. La instalacion de los equipos en el nodo MEVA II de COCESNA se hará una vez que se firme el proyecto entre la OACI y COCENA para la interconexión.

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

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
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	Mar - 2010 Apr/Abri-2010	For the installation of the interconnection in Bogota and Caracas Para la instalación de la interconexión en Bogotá y Caracas For the installation of the interconnection in the COCESNA MEVAII node. Para la instalación de la interconexión en en el nodo MEVA II de COCESNA

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
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	Apr/Abr-2010 Apr/Abr-2010	For the voice and data circuit specified in the interconnection of REDDIG nodes of Bogota and Caracas with MEVA II network , Contract between ICAO and MEVA II service provider (.N° 22500187) Para los circuitos de voz y datos especificados en la interconexión de los nodos REDDIG de Bogotá y Caracas con la red MEVA II , contrato entre la OACI y el proveedor de servicio MEVA II (.N° 22500187) For the voice circuit specified in the interconnection of COCESNA MEVA II node with REDDIG, network , project between ICAO and COCESNA (RLA/09/901) Para los circuitos de voz especificados en la interconexión del nodo MEVA II de COCESNA con la red REDDIG, proyecto entre la OACI y COCESNA (RLA/09/901)

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

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
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	Abr/Apr- 2010 Abr/Apr- 2010	Interconnection of REDDIG nodes of Bogota and Caracas with MEVA II network , Contract between ICAO and MEVA II service provider (.N° 22500187) Interconexión de los nodos REDDIG de Bogotá y Caracas con la red MEVA II , contrato entre la OACI y el proveedor de servicio MEVA II (.N° 22500187) Interconnection of COCESNA MEVA II node with REDDIG, network , project between ICAO and COCESNA (RLA/09/901) Interconexión del nodo MEVA II de COCESNA con la red REDDIG, proyecto entre la OACI y COCESNA (RLA/09/901)

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
24	Service acceptance / Aceptación de los servicios /	MEVA II / REDDIG Member Administrations / Administraciones miembros de las redes MEVA II y REDDIG	Abr/Apr- 2010 Abr/Apr- 2010	Interconnection of REDDIG nodes of Bogota and Caracas with MEVA II network , Contract between ICAO and MEVA II service provider (.N° 22500187) Interconexión de los nodos REDDIG de Bogotá y Caracas con la red MEVA II , contrato entre la OACI y el proveedor de servicio MEVA II (.N° 22500187) Interconnection of COCESNA MEVA II node with REDDIG, network , project between ICAO and COCESNA (RLA/09/901) Interconexión del nodo MEVA II de COCESNA con la red REDDIG, proyecto entre la OACI y COCESNA (RLA/09/901)

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

Item No.	Action / Acción	Responsible / Responsible	Completion Date / Fecha de Finalización	Status- Encountered Difficulties / Estado-Dificultades encontradas
1	2	3	4	5
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	Abr/Apr- 2010 Abr/Apr- 2010	Interconnection of REDDIG nodes of Bogota and Caracas with MEVA II network , Contract between ICAO and MEVA II service provider (.N° 22500187) Interconexión de los nodos REDDIG de Bogotá y Caracas con la red MEVA II , contrato entre la OACI y el proveedor de servicio MEVA II (.N° 22500187) Interconnection of COCESNA MEVA II node with REDDIG, network , project between ICAO and COCESNA (RLA/09/901) Interconexión del nodo MEVA II de COCESNA con la red REDDIG, proyecto entre la OACI y COCESNA (RLA/09/901)

- END / FIN -

APPENDIX E

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Interconnection between the COCESNA MEVA II node and the REDDIG

Implementation Programme
Rev1

January 2010

Table of Contents

Interconnection between the COCESNA MEVAII Node and the REDDIG

Implementation Programme

1. Executive Summary

1.1 Based on the communication requirements of the COCESNA node for interconnecting the MEVA II / REDDIG networks, and on the technical premises contained in the proposal, the integrated solution consists of the provision, installation and testing of the equipment described in paragraph 2.3.1, and the operation of the COCESNA node within the REDDIG, hereinafter called the COCESNA/REDDIG node, applying the highest standards in terms of availability, reliability, and quality of services to be provided through the network.

1.2 The proposed solution contemplates making maximum use of the equipment currently available in the COCESNA/MEVA II node in order to optimise investment costs. This means that an additional Linkway 2100 modem will be used with the existing RF chain, a solution that is supported by the link budget performed to this end. Likewise, the slots available in the existing FRAD equipment will be used for the installation of additional cards to support the communication channels of the COCESNA/REDDIG node.

1.3 In addition to the two exclusive ATS voice channels, an administrative *on net* voice channel will be configured for maintenance tasks and coordination, thus saving in the cost of international long distance calls.

1.4 The installation of the equipment in the node will be done in coordination with COCESNA and AGS, in order to minimise outage time of communication services on the node. Satellite *line up* testing the commissioning of the COCESNA/REDDIG node will be done under the coordination and supervision of the REDDIG Operations Centre.

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

2. Implementation References

2.1 Project RLA/09/901

Service Management Agreement between the *Corporación Centroamericana de Servicios de Navegación Aérea* (Central American Corporation of Air Navigation Services - COCESNA) and ICAO.

2.2 Technical Premises

2.2.1 Based on the communication requirements of the COCESNA node for the interconnection of the MEVA II / REDDIG networks, the solution consists of the provision, installation and testing of the equipment, as well as the operation of the COCESNA MEVA II node within the REDDIG, applying the highest standards in terms of availability, reliability, and quality of the services to be provided through the network.

2.2.2 The technical solution implies making maximum use of the equipment currently installed in the COCESNA node, with the necessary additional equipment for the node to operate within the REDDIG. Memotec cards (one V.35H and two DAV with three FXS interfaces) will be provided and installed in the CX960e unit by COCESNA at its request.

2.2.3 In addition to the two exclusive ATS voice channels, an administrative *on net* voice channel will be configured for maintenance tasks and coordination.

2.2.4 The installation of the equipment on the node will be done in coordination with COCESNA and the MEVA II service provider, in order to minimise outage time of communication services on the node. The satellite *line up* testing and the commissioning of the COCESNA/REDDIG node will be done under the coordination and supervision of the REDDIG Operations Centre.

2.2.5 The COCESNA/REDDIG node will have the technical facilities available to the REDDIG, such as 24x365 technical support by the Manaus Operations Centre in Brazil, geographical redundancy of the network *Master Reference Terminal*, local redundancy of the NCCs in both Manaus, Brazil, and Ezeiza, Argentina, and, if required, the activation of the alternate Operations Centre in Ezeiza.

2.2.6 The COCESNA node communication requirements are:

(1) ATS voice channel with the Bogota Control Centre, in Colombia; and
(1) ATS voice channel with the Guayaquil Control Centre, in Ecuador.

2.2.7 The expected performance involves having the channels free and available all the time, with a call loss probability of 0.05 (5%) for the traffic flow on the ATS speech channels of the COCESNA/REDDIG node.

2.3 Services to be provided

2.3.1 The COCESNA/REDDIG node implementation programme will include the provision of services up until the activation of the COCESNA/REDDIG node, at which time they will be automatically and seamlessly transferred to the Operations Service.

Equipment to be provided
(1) One Linkway 2100 modem with AC power supply
(1) One serial ground interface with f*rame relay* protocol
(1) One V.35 cable
(2) Two L-band combiners/separators
(1) A set of coaxial cable, connectors and adaptors

2.3.2 The installation of the equipment will be done under the Implementation Programme, in coordination with COCESNA and the MEVA II service provider, in order to minimise service outage time.

2.3.3 Satellite access and Linkway 2100 modem *line up* tests will be carried out together with the current RF chain, in order to obtain the nominal satellite downlink power contracted by the REDDIG.

2.3.4 The REDDIG Administration will provide the following services and facilities, 24H x 365D, to the COCESNA/REDDIG node throughout the contracting period. It is important to note that these services and facilities are the same as those currently being provided to all the REDDIG member States.

2.3.5 Configuration:

a) Configuration of the COCESNA/REDDIG node in the REDDIG NCC database
b) Configuration of the CX-960e Memotec equipment with the functionalities required for the interconnection
c) Configuration of the CX-950 Memotec equipment at the Guayaquil, Bogota, Manaus, and Ezeiza nodes with the functionalities required for the interconnection and for administrative/maintenance purposes.
d) End-to-end testing and activation of the COCESNA/REDDIG node.

2.3.6 Operational support: The REDDIG Administration has an Operations Centre in Manaus, Brazil, that provides operational maintenance support, 24H x 365D, to the REDDIG nodes. This support includes, among other main activities, advising the nodes, as a preventive measure, of any anomalies identified by the NCC, receiving calls from the nodes, conducting *troubleshooting* procedures, operational testing, the necessary coordination and testing with the other counterpart nodes in order to keep in operation the node that requires support.

3. Coordination

3.1 The REDDIG Administration will coordinate all the necessary aspects with the representatives of COCESNA and the AGS service provider for the execution of this Implementation Programme.

3.2 To this end, focal points are as follows:

a) ICAO – SAM Regional Office

Focal Point:	Onofrio Smarrelli
	CNS – SAM Regional Officer
Location:	Lima, Peru
Telephone:	51-1-611 8686
E-mail:	os@lima.icao.int

REDDIG Administration - ADM

Focal Point:	Luis Alejos
	SAM REDDIG Administrator
Location:	Manaus, Brazil
Telephone:	55-92-3652 5714
E-mail:	lat@lima.icao.int

b) COCESNA

Focal Point:	
Location:	
Telephone:	

E-mail:

c) AGS
Focal Point:

Location:
Telephone
E-mail:

4. Activities for the activation of the COCESNA node within the REDDIG

1. Procurement of equipment and parts
Responsible party: ICAO TCB
Status: Finalised

2. On-site inspection
Starting date: 8 February 2010
Duration: 2 days
Responsible party: REDDIG Administration

3. Delivery of equipment and parts to the COCESNA node
Starting date: 1 February 2010
Duration: 20 days
Responsible party: REDDIG Administration

4. Satellite configuration of the COCESNA node at the REDDIG NCC
Starting date: 22 February 2010
Duration: 5 days
Responsible party: REDDIG Administration

5. Configuration of the COCESNA CX960e Memotec equipment
Previous steps: a) Provide the ADM with the file (.cxt) containing the latest configuration of CX-960e equipment
b) Install 2DAV+1V.35H on CX960e equipment
Deadline: 18 February 2010
Responsible party: AGS
Starting date: 22 February 2010
Duration: 5 days
Responsible party: REDDIG Administration

6. Configuration of SEGU Memotec equipment, Guayaquil-Ecuador
Previous step: a) Install 1 DVP2 on each piece of equipment

Deadline: 18 February 2010
Responsible party: REDDIG Administration

Starting date: 22 February 2010
Duration: 5 days
Responsible party: ADM

7. Configuration of SKED Memotec equipment, Bogota-Colombia
   Previous step: a) Provide ADM with the file (.cxt) containing the latest configuration of SKED, including the circuits with MEVA II
   Deadline: 18 February 2010
   Responsible party: AGS
   Starting date: 22 February 2010
   Duration: 5 days
   Responsible party: REDDIG Administration

8. Configuration of Memotec equipment at SAEZ and SBMN
   Starting date: 22 February 2010
   Duration: 5 days
   Responsible party: REDDIG Administration

9. Installation of Linkway2100 at the COCESNA node
   Starting date: 3 March 2010
   Duration: 1 day
   Responsible party: REDDIG Administration, AGS, COCESNA

10. Satellite *line up* of Linkway2100 at the COCESNA node
    Starting date: 3 March 2010
    Duration: 1 day
    Responsible party: REDDIG Administration, AGS

11. End-to-end testing and activation of the COCESNA node within the REDDIG
    Starting date: 3 March 2010
    Duration: 2 days
    Responsible party: REDDIG Administration

12. Evaluation of communications
    Starting date: 3 March 2010
    Duration: 2 days
    Responsible party: ADM, COCESNA

13. Service acceptance
    Starting date: 5 March 2010
    Duration: 1 day
    Responsible party: COCESNA

APPENDIX F

COURSE INTRODUCTION TO SATELITE COMMUNICATIONS AND REDDIG OPERATION

AGENDA

Introduction to Satellite Communications

1. Satellites
- a. Fundamentals
- b. Orbits
- c. Geostationary satellites - Parameters
- d. Ratiation pattern
- e. Frequency bands and services

2. Earth Stations
- a. Antennas (teleports, VSAT)
- b. Power amplifiers (HPA, SSPA)
- c. Ascent (BUC) and descent (LNB) converter
- d. Modulator / Demodulator (MODEM)
- e. Baseband (multiplexers) and User Interfaces
- f. Monitoring, and Control (M & C)
- g. Power system
- h. Ground system
- i. REDDIG Station

3. Multiple Access Types
- a. Frequency division (FDMA)
- b. Time division (TDMA) - Application in the REDDIG
- c. Code division (CDMA)

4. Types of Assignment
- a. Permanent (PAMA)
- b. On demand (DAMA) – Application in the REDDIG

5. Design Model
- a. Parameters and equations
- b. Calculation of link (Link Budget)
- c. Technical performance
- d. Quality of Service (QoS)

REDDIG Operation

6. NCC/NMS

a. Generalities and System functions Linkway
b. Commands mainly used
c. Monitoring, and Remote Control (M & C) of Stations

7. Station Operation

a. Monitoring, and Control (M & C) local
   - Control Wiring
b. Page "Status" of the station
c. Pages of control:
   - SSPA, Chain and Redundancy
d. Linux PC:
   - Shortcut Commands
e. Minicom program via Linux PC and console port
   - FRAD
   - MODEM
f. Use of TELNET, FTP Applications
g. Software support: CxAccess, CxTool
h. PROC-FRD procedures
i. PROC-MOD procedures
k. PROC-SSP procedures

8. Troubleshooting

a. Procedures and actions
b. Simulations

9. Migration of the satellite

a. Considerations on the satellite migration
b. IS-1R Migration to IS-14 Satellite

- - - - -

APPENDIX G

Course Introduction to Satellite Communications and REDDIG Operation

Paramaribo, Suriname, 12 to 14 October, 2009

Course History

1. Place and duration of the meeting

The Course Introduction to Satellite Communications and REDDIG Operation was held in the premises of Training Centre of Civil Aviation Suriname located in Paramaribo, from 12 to 14 October, 2009.

2. Opening

Mr. Saboerali MS, Division Manager of Aerodromes, Civil Aviation Department Suriname, representing the Director of Civil Aviation Department of Suriname, welcomed the course participants and thanked ICAO for the development of this course in Suriname, highlighting the importance of training of technical personnel working in civil aviation.

3. Instructor

The course was given by Mr. Luis Alejos, REDDIG Administrator.

4. Working Languages

The course was given in English.

5. Course Content

The course content is described in Appendix F.

At the end of the course, a CD containing the presentations with the topics covered in the same, was delivered to each State, as well as additional technical information such as "Fundamentals of Telecommunications", "Communications Handbook", equipment general operating procedures, among others.

6. Attendance

The meeting counted with the attendance of 14 delegates pertaining to States of France, Guyana, Suriname, and Trinidad & Tobago.

APPENDIX H

Course Introduction to Satellite Communications and REDDIG Operation

Maiquetía, Venezuela, 19 to 21 October, 2009

Course History

1. Place and duration of the meeting

The Course Introduction to Satellite Communications and REDDIG Operation was held in *Salon Venezuela* of *Instituto Aeropuerto Internacional de Maiquetía*, International Airport Simón Bolívar, Maiquetia, Venezuela, from 19to 21 October, 2009.

2. Opening

Mr. Jamani Ramírez, Maintenance Manager of Air Navigation Services Direction, welcomed the course participants and thanked ICAO for the development of this course in Venezuela, highlighting the importance of training of technical personnel working in civil aviation.

3. Instructor

The course was given by Mr. Luis Alejos, REDDIG Administrator.

4. Working Languages

The course was given in Spanish.

5. Course Content

The content of this course is described in Appendix F.

At the end of the course, a CD containing the presentations with the topics covered in the same, was delivered to each State, as well as additional technical information such as "Fundamentals of Telecommunications', 'Communications Handbook', equipment general operating procedures, among others.

6. Attendance

The meeting counted with the attendance of 40 delegates pertaining to States of Argentina, Bolivia, Brasil, Colombia, Ecuador, Paraguay, Peru and Venezuela.

APPENDIX I

RTO/3 REDDIG

INTERNATIONAL CIVIL AVIATION ORGANIZATION

THIRD REDDIG TECHNICAL-OPERATIONAL MEETING

FINAL REPORT

(Paramaribo-Suriname, 15 - 16 October 2009)
(Maiquetía-Venezuela, 22 - 23 October 2009)

TABLE OF CONTENTS

History of the Meeting

ii.1 **Place and Duration**

Paramaribo, Suriname: The third REDDIG Technical-Operational Meeting was held on 15-16 October 2009 at the facilities of the Training Centre of Civil Aviation of Suriname, in Paramaribo.

Maiquetía, Venezuela: The third REDDIG Technical-Operational Meeting was held on 22-23 October 2009 at the Venezuela Room of the *Instituto Aeropuerto Internacional de Maiquetía*, at the Simón Bolívar International Airport, in Maiquetía, Venezuela.

ii.2 **Opening**

Paramaribo, Suriname: Mr. Saboerali M.S., Manager of the Aerodromes Division, Civil Aviation Department of Suriname, on behalf of the Director of the Civil Aviation Department of Suriname, opened the meeting and welcomed the participants.

Maiquetía, Venezuela: Mr. Rafael Torres Aguirreche, General Manager of Safety of INAC opened the meeting and welcomed the participants.

ii.3 **Secretariat**

Paramaribo, Suriname: Mr. Luis Alejos, REDDIG Administrator, acted as Secretary of the meeting, with the assistance of Mr. Maharban, delegate of Suriname.

Maiquetía, Venezuela: Mr. Luis Alejos, REDDIG Administrator, acted as Secretary of the meeting, with the assistance of Mr. Luis Escobar, delegate of Venezuela.

ii.4 **Working language**

Paramaribo, Suriname: The working language of the meeting was English.

Maiquetía, Venezuela: The working language of the meeting was Spanish.

ii.5 **Agenda**

The following Agenda was adopted:

Agenda Item 1: Brief presentation of the current status of REDDIG equipment and nodes

Agenda Item 2: REDDIG node station maintenance programme

Agenda Item 3: Spare part logistics and optimisation of current equipment, as applicable

Agenda Item 4: REDDIG IP addressing plan

Agenda Item 5: New services in the Region

Agenda Item 6: Migration to the IS-14 satellite

ii.6 **Work modality**

The meeting discussed the items in plenary sessions.

ii.7 **Attendance**

The Meeting was attended by twelve States/Territories: Argentina, Bolivia, Brazil, Colombia, Ecuador, France, Guiana, Paraguay, Peru, Suriname, Trinidad and Tobago, and Venezuela, with a total of 41 participants. The list of participants is attached to this part of the report.

Agenda Item 1: Brief presentation of the current status of REDDIG equipment and nodes

1.1 It was stated that the technology of the equipment in REDDIG nodes and in the REDDIG control and management centres (NCCs/NMSs) dated back to 2002. Also, REDDIG equipment such as the FRAD and Linkway MODEM models were no longer commercially available in the market.

1.2 The REDDIG Administration then presented the status of REDDIG equipment.

ViaSat Inc. Linkway system

1.2.1 The RCC/8 meeting formulated Conclusion RCC 8/2 - *Replacement of hardware and update of software in Linkway NCC/NMS Frame Relay equipment*, with a view to the development of a plan for the replacement of hardware and software in Linkway NCC/NMS Frame Relay & IP equipment.

1.2.2 The RCC/9 meeting (Lima, Peru, 23-24 March 2006) considered the need to update the Linkway NCC/NMS Frame Relay & IP system software, and analysed the condition of REDDIG NCC SUN stations (hardware), which were being discontinued by the manufacturer. The software version of the Linkway NCC/NMS Frame Relay & IP system dated back to 2002.

1.2.3 The meeting noted that this update would cost USD 45,530.00, covering the purchase of six (6) SUN stations (with no monitors), the updating of Linkway FR&IP software, one-year maintenance of the software, and support provided from the ViaSat factory site.

1.2.4 The RCC/10 meeting (Lima, Peru, 5-7 March 2007) noted that the 'software' and 'hardware' updating would take place once a specialised network support technician was available.

1.2.5 In July 2007, the project requested a quote from ViaSat for the updating of the aforementioned software and hardware. The cost was USD 119,400.00, since it contemplated a complete change of hardware platform and operating system consistent with the new system software.

1.2.6 The RCC/11 meeting (Lima, Peru, 5-6 May 2008) agreed that, given the large investment involved in the improvements (updating of hardware and software) in the NCC/NMS of the Linkway 2100 system, a study should be conducted and submitted to the RCC/12 meeting, in order to select the best timing for such investment. In this regard, the meeting formulated Conclusion RCC 11/3 - *Cost-benefit analysis for improving the Linkway system software*.

1.2.7 The introduction of improvements (software and hardware updates) to the NCC/NMS Linkway 2100 had made recommended by the REDDIG Administration as a procedure commonly used in state-of-the-art systems to avoid obsolescence and not as a functional requirement of the network.

1.2.8 The technology of the Linkway 2100 system, core platform of the REDDIG, was providing an efficient operation of all the new services based on the IP protocol (AMHS, RADAR, VoIP), which had already been operationally tested in the REDDIG.

1.2.9 In order to present recommendations on Linkway system improvements,

consultations were made regarding plans to continue manufacturing the Linkway 2100 modem (satellite modem) and its corresponding Linkway 2100 NCC/NMS.

1.2.10 It was noted that the aforementioned products were not being advertised by ViaSat in its publications and website www.viasat.com.

1.2.11 The manufacturer stated that the product developed by ViaSat was the Linkway S2 modem (based on DVB-S2 technology for reception) with Linkway S2 NCC/NMS software. Likewise, according to available information, the new Linkway S2 modem could be made compatible with the Linkway 2100 modem, but the Linkway 2100 modem was not compatible with the Linkway S2 modem.

1.2.12 Taking into account that the manufacturer would not continue developing the technology used on the Linkway 2100 system, although this Linkway 2100 system, which is the REDDIG platform, is operationally valid for existing and new services to be provided in the Region, it was recommended that no investments be made to improve the Linkway 2100 NCC/NMS (software and hardware updates).

FRAD system (CX950/950e equipment) manufactured by Memotec

1.2.13 Ever since its installation in 2002, the REDDIG has used CX950 equipment with interface (I/O) cards for processing voice and data of services provided on the network.

1.2.14 The software version of CX950 equipment has been updated throughout the operational life of REDDIG to resolve anomalies in the processing of signals and to meet the operational requirements of some of the services provided on the REDDIG. The company even manufactured a version that was initially used exclusively by the REDDIG.

1.2.15 CX950 equipment (basic unit), comprising supply sources and the *motherboard*, was discontinued in 2006. The manufacturer stated that CX950e equipment was its equivalent replacement. It is important to note that interface (I/O) cards are compatible with both CX950 and CX950e equipment.

1.2.16 On some REDDIG nodes, CX950 equipment (basic unit) has been replaced with CX950e equipment (basic unit) when a failure was diagnosed in the *motherboard*.

1.2.17 CX950 and CX950e equipment, with interface (I/O) cards, are totally interoperable within the REDDIG.

1.2.18 CX950/950e equipment is permitting the efficient provision of all services since early 2003 and is also supporting the new services based on the IP protocol (AMHS, RADAR, VoIP), which have already been operationally tested on the REDDIG.

1.2.19 As with the Linkway 2100 system, consultations were made about plans to continue manufacturing CX950e equipment and its interface (I/O) cards.

1.2.20 It was noted that the aforementioned products of the series were not being commercially advertised by Memotec on its website www.memotec.com. The information provided by Memotec was that the product that replaced CX-950e was CX960e and that it would be sold only until 30 July 2009 (‘end of life’ of the product).

RF system (SSPA/LNB equipment) from Paradise Datacom

1.2.21 Paradise Datacom, manufacturer of SSPA equipment, had been developing its product since 2002, when they were installed on the REDDIG (2K series). Changes made to their new SSPA models were consistent with the transmission requirements of REDDIG stations.

1.2.22 The REDDIG project acquired a new SSPA model (100K series) in 2005 and, in recent years, some States have also purchased other new SSPA models (200K series). They are all fully interoperable at the level of RF transmission.

1.2.23 It is important to note that when new SSPA equipment is acquired, the M&C (Monitoring & Control) facility of the new SSPA equipment should be interoperable with the current RM&C system of the REDDIG. Accordingly, the purchase order should specify that the SSPA M&C must have a 38400-baud binary communication protocol.

1.2.24 The current LNB model could continue operating, and if new equivalent models were purchased, the electric and mechanical specifications should meet the operational characteristics of the network.

Antenna system

1.2.25 The antenna system could continue operating until the migration is made to a new communications platform, following the recommendations with regard to mechanical and electric maintenance.

Recommendations

1.2.26 Taking into account the above, the twelfth meeting of the REDDIG Coordination Committee (RCC/12) defined the action to be taken regarding REDDIG equipment, and formulated Conclusion RCC 12/1: *Action to keep the REDDIG equipment operating in the coming years*.

1.3 Presentations on the status of the nodes

Meeting in Paramaribo, Suriname

1.3.1 Presentations were made by each delegate of the four States/Territories participating at the meeting on the operational status of their respective nodes.

1.3.2 The delegate of Suriname reported that their new ATM system would begin operations in June 2010.

1.3.3 The delegates of France, Guiana, Suriname, and Trinidad & Tobago stated that their technicians could not communicate in English with the Manaus NCC operators when asking for technical support or making a technical consultation. In this regard, the REDDIG Administrator informed the meeting that, since February 2009, all the Brazilian operators of the Manaus NCC were taking English and Spanish classes paid by Brazil.

1.3.4 In view of the above, the meeting suggested that one or two English-speaking technicians from any of the States participating at the meeting be sent to the Manaus NCC to be trained and to serve English-speaking countries from the NCC for a given period of time. This

would solve the English language communication deficiency stated in paragraph 1.3.3.

1.3.5 The delegates of France and Trinidad & Tobago stated that their operators had serious difficulties in communicating with Dakar, Senegal, and suggested the possibility of interconnecting the REDDIG and CAFSAT networks to overcome such difficulties.

Meeting in Maiquetía, Venezuela

1.3.6 Each of the delegates from the eight States participating at the meeting explained the operational situation of their respective nodes.

1.3.7 The delegate of Argentina made an extensive graphical presentation of their domestic operations, showing the various types of services, their technologies and facilities, and their administration.

1.3.8 The delegate of Bolivia informed about their plans to purchase an AMHS system in 2010.

1.3.9 The delegate of Colombia also informed about their plans to renew their national satellite network in 2011.

1.3.10 The delegate of Paraguay stated that their satellite network project would be implemented in 2011.

1.3.11 The delegate of Peru informed that they had two projects that would be implemented in late 2010 for the purchase of eight radars with their respective satellite equipment, and the implementation of a national VSAT network, with 17 stations.

1.3.12 The delegate of Venezuela informed that their new AMHS system would begin operations in April 2010.

Agenda Item 2: REDDIG node station maintenance programme

2.1 It was noted that since REDDIG was a telecommunications network for aeronautical applications and services in the South American Region, its overall maintenance programme was dynamically reviewed and would be updated based on age and operation of the network and the technology used on REDDIG node equipment.

2.2 The RTO/2 meeting, held in Manaus on 21-22 September 2006, made recommendations on an operational maintenance programme for the various components of a REDDIG station.

2.3 The meeting noted that, according to Conclusion RCC 12/1, existing REDDIG equipment had to be maintained for a minimum period of three years.

2.4 It was also stated that on-going training of local technical personnel on general procedures for the operation of the equipment should be a condition for keeping the station operational.

Recommendations

2.5 In addition to the recommendations on the operational maintenance of the REDDIG station, emphasis was placed on the following actions:

AC power and grounding systems

2.6 Check, on a monthly basis, that all AC power feeder circuits of the REDDIG have a value greater than 1.0 VAC between the neutral line and ground, the target value being 0.5VAC. If this value is not attained, the REDDIG Administration must be informed.

2.7 Purchase and install insulating AC transformers to eliminate transient peaks on each AC circuit entering the REDDIG. It is recommended that this installation be done by late 2009.

2.8 Check, on a monthly basis, that the equivalent resistance of the grounding system does not exceed 5 ohms.

SSPA equipment

2.9 In addition to the SSPA air circulation system clean-up programme, check, every fortnight, the normal operation of the two fans of the two sets of SSPA equipment at the station.

2.10 Purchase a set of four new fans per station, to replace the existing ones installed on the SSPA equipment. It was recommended that this acquisition be done by late 2009.

2.11 Purchase a 110 cm-long flexible transmission wave guide per station to replace the existing one, as necessary.

FRAD equipment

2.12 In addition to the equipment clean-up programme, check, every fortnight, the normal operation of all FRAD equipment fans.

2.13 Purchase a set of eight new fans per station to replace those currently installed in the FRAD equipment. It was recommended that this purchase be done by late 2009.

Training

2.14 Train all local technical personnel involved in the services provided through the node on the general procedures for the operation of station equipment.

Agenda Item 3: Spare part logistics and optimisation of current equipment, as applicable

3.1 The Meeting was informed that, ever since operations started in 2003, the REDDIG Administration had been collecting statistics on network operation in terms of equipment and part failures, logistics, and the number of repairs in each node. This information has enabled spare part logistic management and the analysis of improvements, as well as the optimisation of FRAD equipment at the nodes, as applicable.

Logistics and spare part management

3.2 The Meeting took note that logistics, mainly resulting from equipment failures, comprised: the delivery of equipment and parts from the REDDIG spare part stock at the warehouse located at the Lima Regional Office or from any other node having spare parts in loan, to the nodes requiring them; coordination with the manufacturers for the repair of the equipment; payment for transportation of equipment or parts; payment to manufacturers for repair of equipment; coordinating with and supporting the States for the import/export of the equipment and spare parts needed at the nodes. This support also included the purchase and transportation of equipment on behalf of the States for their respective nodes.

3.3 It was reported that, in 2008, 21 logistics operations were carried out, and by October 2009, 21 have been carried out. A 2008 summary of failures of the main pieces of equipment and parts was presented.

FRAD	**Manufacturer: Memotec**	
(2)	Power Supply Module	: (1) SBCT, (1) SYGC
(4)	Universal I/O Card	: (1) SYGC, (2) SGAS, (1) SCEL
(1)	Motherboard CX950	: (1) SGAS
(1)	V.35H Card	: (1) SGAS
(5)	Fast Ethernet Card	: (2) SEGU, (2) SVMI, (1) SBCT
(1)	E&M SLIM Card	: (1) SVMI
(8)	Internal Fan	: (4) SYGC, (1) SBRF, (2) SBCT, (1) SAEZ
MODEM	**Manufacturer: ViaSat**	
(7)	Linkway 2100	: (1) SAEZ, (1) SYGC, (2) TTZP, (2) SBMN, (1) SGAS
SSPA	**Manufacturer: Paradise Datacom**	
(3)	SSPA units	: (1) SKED, (1) SUMU, (1) SBRF
(11)	External Fan	: (2) SUMU, (4) SYGC, (1) SBRF, (4) TTZP
Others - REDDIG		
(1)	Base Band Switch	: (1) SYGC

3.4 2008 statistics were also presented in **Appendix A** to this part of the report in relation to main repairs in network nodes, as well as their distribution in terms of type of equipment that required the repair.

3.5 The Meeting noted that the purpose of improving spare part logistics was to reduce the time required for administrative processing in the States, for both importing and exporting equipment or parts. Consequently, emphasis was placed on the recommendation that States expedite their administrative processes in coordination with the REDDIG Administration.

3.6 Along these same lines, the delegate of Venezuela proposed an analysis of the facilities listed in Annex 9 for prompt and immediate delivery of spare parts between the States, with the support of the airlines.

3.7 The list of points of contact of each node was updated as follows:

SAEZ	Cristian Javier Vittor
SLLP	Hugo Balderrama
SBCT	Joao Felipe Buenaga
SBMN	Alessandro Mamede
SBRF	Paulo Santa Clara
SCEL	Christian Vergara
SKED	Gabriel Gusmán
SEGU	Raúl Avellán
SOCA	Michel Metzelard
SYGC	Mortimer Salisbury
SGAS	Aldo Pereira
SPIM	Jorge García
SMPM	Rabindre Maharban
TTZP	Richard Halliday
SUMU	Miguel Vera
SVMI	Luis Escobar

3.8 In order to update the directory of REDDIG voice channels, the States/Territories were asked to send by 30 November 2009 the updated page of their voice channels in their nodes. Once this information is collected, the REDDIG Administration will circulate the REDDIG Directory to all the nodes.

Optimisation of the FRAD equipment at the nodes, as applicable

3.9 The meeting took note that the purpose of this optimisation, whenever possible, was to use a single MPS FRAD equipment instead of two pieces of equipment (MUX + MPS), but keeping all the services provided through the station in such a way that the operation with a single FRAD equipment was seamless for all service users. As a result of this optimisation, each station would have two (2) basic pieces of equipment CX-950 (motherboard card + power sources), two (2) ring generator cards and two (2) V.35H cards.

3.10 It was noted that the this optimisation of FRAD equipment had already been carried out in the two chains of the SGAS station in Asunción and all the services were operating normally on the “new” MPS FRAD equipment.

3.11 List of stations to be optimised

SBCT – Curitiba, Brazil
SBRF – Recife, Brazil
SCEL – Santiago, Chile
SGAS – Asunción, Paraguay
SLLP – La Paz, Bolivia
SMPM – Paramaribo, Suriname
SOCA – Cayenne, French Guyana
SYGC – Georgetown, Guiana
TTZP – Piarco, Trinidad & Tobago

3.12 It was noted that work on the hardware and software for the optimisation of the FRAM equipment would be coordinated by the REDDIG Administration with each point of contact of the stations involved, in order to provide the corresponding technical guidelines and recommendations.

Agenda Item 4: REDDIG IP addressing plan

4.1 The Meeting noted that the REDDIG was a multi-protocol network and thus, also supported aeronautical applications and services based on the IP protocol, like the AMHS service, which were being incorporated into the REDDIG to provide international services between the various States of the Region.

4.2 It was noted that the States of the Region were managing, within their jurisdiction, the assignment of private IP addresses for their new applications based on the IP protocol, and that some States used the same range of IP addresses for their IP applications, thus potentially creating addressing or routing conflicts in the networks when these applications or services were exchanged between the States.

4.3 It was noted that the ATN Task Force of the CNS Committee of the GREPECAS ATM/CNS Subgroup had prepared a complete scheme for the assignment of IP addresses (IPv4) for the CAR/SAM Regions and that, specifically for the SAM Region, the REDDIG Administration used the indicated addressing for intra-regional links.

Recommendations

4.4 It was recommended that the IP address assignment scheme for the SAM Region shown in **Appendix A** to this part of the report be adopted in order to implement in the REDDIG all IP-based applications with planned IP address assignments for links used by States in their international connections, while keeping the IP address assignments by the States in their internal networks.

4.5 Use the NAT (Network Address Translation) facility on the network equipment (routers), both to/from origin/destination, to translate the respective addresses.

Agenda Item 5: New services in the Region

5.1 Under this agenda item, the Meeting was informed that new and existing aeronautical applications based on the IP protocol were being implemented or planned for implementation in the States of the Region. Amongst these applications were AMHS, RADAR and VoIP services.

5.2 The Meeting was also informed that operational testing of aeronautical applications based on the IP protocol had been conducted satisfactorily since 2006, including radar data exchange between the SVMI and SBMN nodes for a one-month period, demonstration testing of the AMHS system between SAEZ and SPIM, VoIP communications testing between SBCT, SBMN and SAEZ, and operational testing of AMHS between SAEZ and SGAS.

5.3 Regarding the activation of new services, the delegate of Argentina informed that operational tests would be conducted in November 2009 between the MTA servers of SAEZ and SGAS for their subsequent start-up.

5.4 The delegate of Argentina also stated that radar data exchange (with IP protocol) would be established in November 2009 between the airports of Ezeiza, in Argentina, and Carrasco, in Uruguay, using network equipment lent by the Argentine Administration to be scheduled and installed at the SUMU node by Argentine technical personnel.

5.5 The delegate of Colombia informed of their plans to conduct tests in November 2009 between their new AMHS system and the AMHS system of Peru, taking into account that they both shared the same system provider.

5.6 The Administration of Venezuela, through its delegate, offered to install a Venezuelan AMHS terminal at the Georgetown SYGC node in Guiana for the exchange of messages between the two countries. This would be done after the AMHS system of Venezuela was implemented.

5.7 The delegates of Argentina and Bolivia expressed their common interest in having the Administration of Argentina install an Argentine AMHS terminal at the SLLP node of La Paz, in Bolivia, for the exchange of messages between the two countries.

Recommendations

5.8 In order to reduce hardware for the exchange of existing and new IP-based applications, and to optimise the use of bandwidth in the REDDIG, the recommendation was to:

a. use a single physical port in MPS FRAD equipment (example: port P03 in the patch panel of the rack) for the exchange of all IP-based applications, such as AMHS and RADAR. Port speed would be established according to the number of FR PVCs, the priority or time sensitivity of applications, and the concurrent nature of communications.

b. A cable to convert DB-25Male to M-34Female connectors would be prepared for each node, in keeping with **Appendix A** to this part of the report, for installation at the specified physical port. Thus, the REDDIG would have a port with V.35 electric interface and DCE protocol.

c. configure in said physical port all FR PVC circuits required for connecting to the other network nodes.

d. connect routing equipment to the physical port of the REDDIG, and configure it with encapsulation Frame Relay (FR) and LMI type equal to ANSI Annex D. The REDDIG Administration would provide the DLCI identifier in due time.

5.9 ATS and ADM voice services would continue to use the current voice over Frame Relay (VoFR) scheme.

5.10 The REDDIG Administration would coordinate with each point of contact at the nodes when planning the implementation of a new service, and also to provide information about equipment configuration parameters, if so required.

5.11 It was also recommended that States continue applying the administrative procedure of asking ICAO and the REDDIG Administration to implement a new service, when so required.

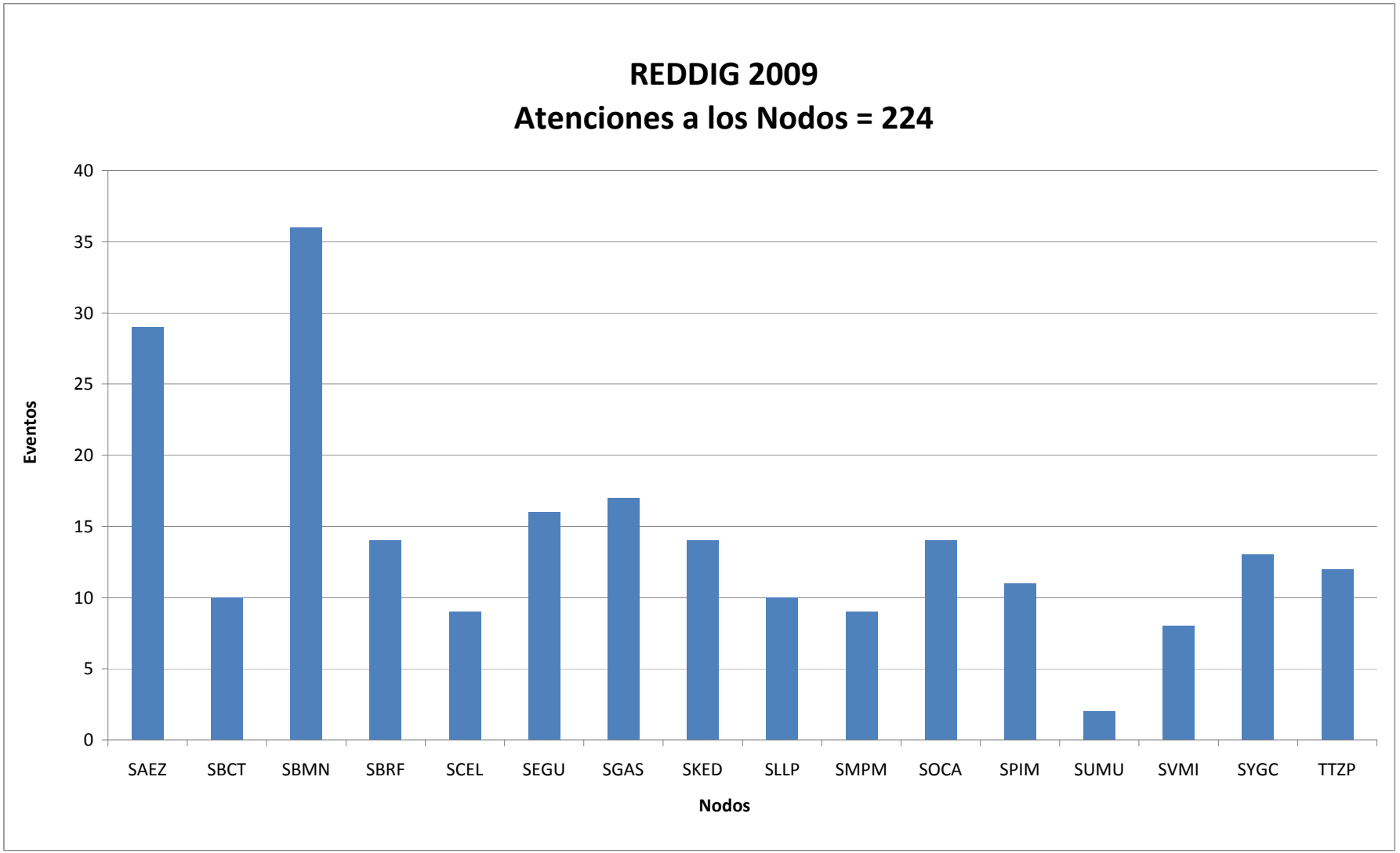
Agenda Item 6: Migration to satellite IS-14

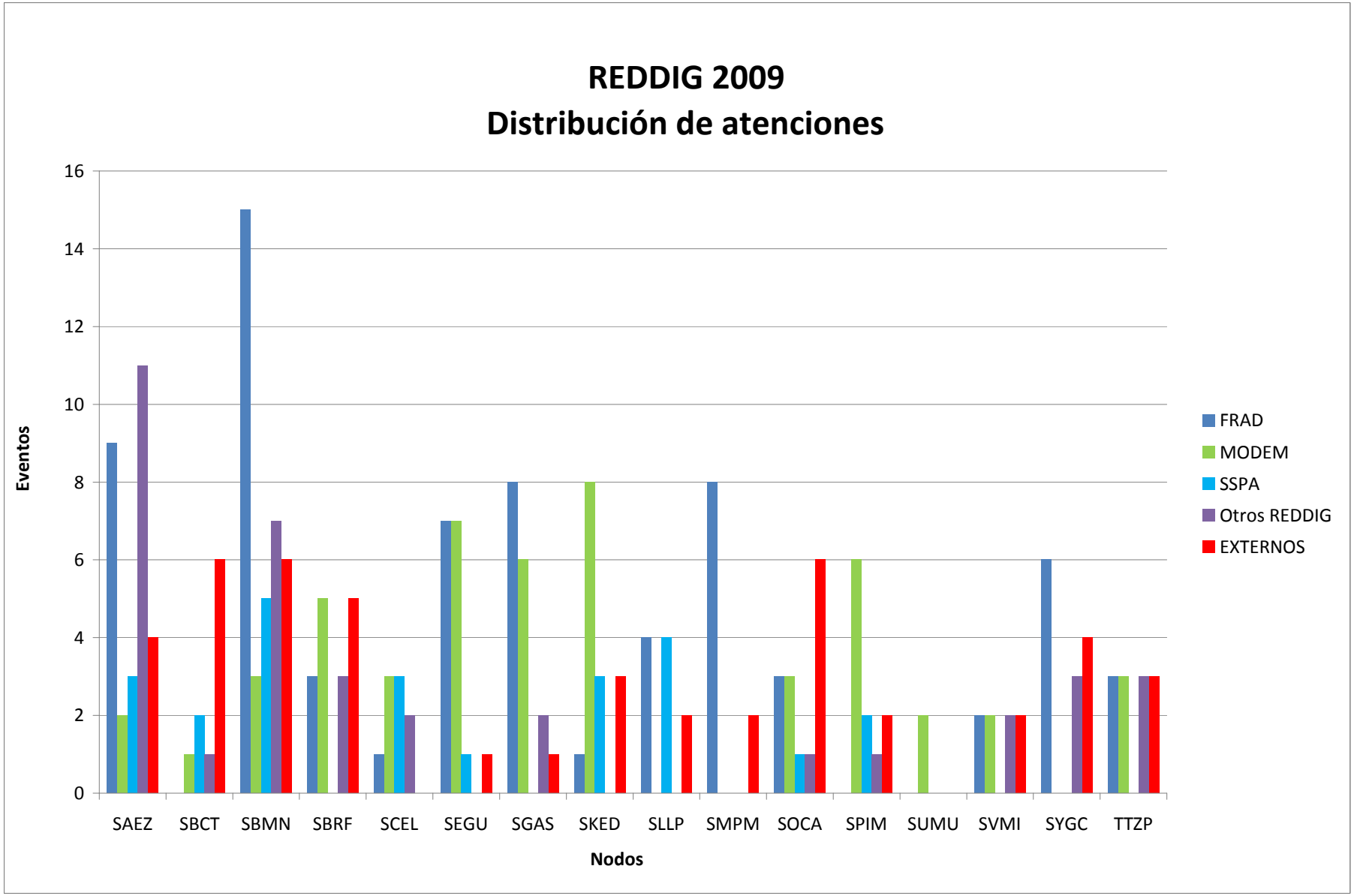
6.1 The Meeting took note of the letter sent by Intelsat Corporation on 6 October 2009 indicating that satellite IS-1R would be replaced around 6 December 2009.

6.2 According to that letter, all services on IS-1R would be transferred to IS-14 using a transition that Intelsat called “Pass In the Night” (PIN). This procedure was designed to ensure a smooth transition, minimising potential interruptions of satellite service and the work required at user earth stations.

6.3 Although only some adjustments would be made at the main network station, if necessary, as stated by Intelsat in its communications, it was recommended at the Meeting that the mechanical elements of the antennae used for azimuth movement as well as its elevation be reviewed at all REDDIG nodes, in addition to the feeder, if adjustments were required.

6.4 On 27 October 2009, a communication was received from Intelsat indicating their plans to migrate all services in Latin America to IS-14 in the early hours of 7 December 2009.


REDDIG 2009
Atenciones a los Nodos = 224
Eventos
40
35
30
25
20
15
10
5
0
SAEZ
SBCT
SBMN
SBRF
SCEL
SEGU
SGAS
SKED
SLLP
SMPM
SOCA
SPIM
SUMU
SVMI
SYGC
TTZP
Nodos


REDDIG 2009
Distribución de atenciones
Eventos
16
14
12
10
8
6
4
2
0
SAEZ
SBCT
SBMN
SBRF
SCEL
SEGU
SGAS
SKED
SLLP
SMPM
SOCA
SPIM
SUMU
SVMI
SYGC
TTZP
Nodos
FRAD
MODEM
SSPA
Otros REDDIG
EXTERNOS


REDDIG 2009
Distribución de atención por categoría de equipo
70
30%
51
22%
24
11%
36
16%
47
21%
1
2
3
4
5