International Civil Aviation Organization
South American Regional Office – Regional Project RLA/03/901
REDDIG Management System and Satellite Segment Administration
Fifteenth Meeting of the Coordination Committee (RCC/15)
Lima, Peru, 15 to 17 August 2012

Agenda item 3: **Report of the activities carried out to date since the last meeting of the Coordination Committee**

(Working paper presented by the Secretariat)

SUMMARY

This working paper contains information on the activities carried out by the Project RLA/03/901 since the fourteenth meeting of the Coordination Committee to date.

Reference

- Report of the Fourteenth Meeting of REDDIG Coordination Committee (RCC/14), Lima, Peru, 16-18 March 2011.
- Seminar/Workshop on New Technologies in Satellite and Ground Networks - Lima, Peru, 18-20 July 2011
- Twelfth Meeting of Civil Aviation Authorities of the SAM Region
- (RAAC/12) – Lima, Peru, 3-6 October 2011
- Meetings/Workshop of the ICAO SAM Implementation Group: SAM/IG/7 - Lima, Peru, 23-27 May 2011; SAM/IG/8 - Lima, Peru, 10-14 October 2011; and SAM/IG/9 - Lima, Peru, 14-18 May 2012.

ICAO strategic objectives:	*A – Safety; and* *C – Environmental protection and sustainable development of air transport.*

1. Background

1.1 The work plan for 2011 adopted by the fourteenth meeting of the Coordination Committee included the following activities, in addition to the routine tasks related to logistics operations, spare parts management and network maintenance:

a) Implementation of AFTN circuits in the MEVA II/REDDIG interconnection;
b) Training programme for 2011;
c) Alternation of the operation of the NCC and the REDDIG management centre;
d) Implementation of new REDDIG services; and
e) Study of the implementation of the new digital network (REDDIG II).

1.2 The work plan for 2012 should have been adopted by the RCC/15 in March 2012, but due to the need to consider at this meeting the results of the tender for the acquisition of the REDDIG II, the RCC/15 was scheduled to be held from 25 to 27 June. However, given that the dates for submission of tenders for the REDDIG II had to be extended at the request of the bidders, it was agreed to postpone the RCC/15 for the period from 15 to 17 August 2012.

1.3 As a result of these changes, the adoption of the main activities of the work plan for 2012 by the REDDIG Member States had to be managed by correspondence, including the following:

a) Training program for 2012, and
b) Procurement process of the new digital network (REDDIG II).

1.4 The following analysis of the activities undertaken to date since the last meeting of the Coordination Committee, includes the activities executed in connection with the work plan adopted for 2011 and those planned for the first half of 2012.

2. Analysis

Implementation of AFTN circuits in the MEVA II/REDDIG interconnection

2.1 With reference to this issue, the current implementation status of the AFTN circuits in the MEVA II/REDDIG interconnection is as follows:

- Maiquetia-Curaçao
- Bogota-Panama
- Lima-Atlanta
- Caracas-Atlanta
- Manaus-Atlanta

Maiquetia-Curaçao

2.2 In June 2011 tests were conducted on the respective REDDIG-MEVA II AFTN circuit. A loopback was installed in the Curaçao-MEVA II port, and a 100% of test messages sent from the Maiquetia Message Center returned back. The circuit has been tested at REDDIG-MEVA II level. So far, operational traffic has not been yet sent.

Bogota-Panama

2.3 In September 2011 tests were conducted on the respective REDDIG-MEVA II AFTN circuit. A loopback was temporarily installed in the Panama-MEVA II port, and a 100% of test messages sent from the Bogota Message Center, returned back. The circuit has been tested at REDDIG-MEVA II level. So far, operational traffic has not been yet sent.

Lima-Atlanta

2.4 In September 2011 tests were conducted on the respective REDDIG-MEVA II AFTN circuit that additionally includes a link between SPIM and SKED stations for such circuit. A loopback was temporarily installed in the P34 Lima-SPIM port, and a 100% of test messages sent from Atlanta returned back. The circuit has been tested at REDDIG-MEVA II level. So far, operational traffic has not been yet sent.

Caracas-Atlanta

2.5 In November 2011 tests were conducted on the respective REDDIG-MEVA II AFTN circuit. A loopback was temporarily installed in the Maiquetia-SVMI port 45, and a 100% of test messages sent from Atlanta returned back. The circuit has been tested at REDDIG-MEVA II level. So far, operational traffic has not been yet sent.

Manaus-Atlanta

2.6 Initial tests were conducted in November 2011 on the respective REDDIG-MEVA II AFTN circuit, which additionally includes a link between the Manaus and Bogota stations (SBMN and SKED) of such circuit. The functioning of the link Manaus (SBMN) – Atlanta (port to port) was checked, remaining the operational tests still pending. Such tests began on 16 May 2012 between the technical and operational staff of Manaus and the FAA.

Training programme for 2011 and 2013

2.7 Continuing with the training plan for REDDIG personnel, the *Seminar/Workshop on New Technologies in Satellite and Ground Network*s was carried out in Lima, Peru, from 18 to 20 July 2011, attended by 20 participants from 10 States and a Territory, members of the REDDIG, 8 of them with project fellowships. Representatives of the United States of America, the industry and ICAO also attended.

2.8 As part of the work plan for 2012 was carried out the Course on ATS Messages Handling System (COM-AMHS) and Interconnection Issues in Lima, Peru, from 16 to 20 July 2012. The course had an attendance of 34 specialists from the technical and operational areas of the aeronautical communications services of 11 REDDIG member States, 5 of them as fellowship holders of the project. The execution of this course was coordinated with the ATM Training Department of the Institute of Air Navigation Services of EUROCONTROL and was taught by an instructor of that entity.

Alternation of the operation of the NCC and the REDDIG management centre

2.9 At the beginning of April 2011, Intelsat officers informed the REDDIG administration that an interfering signal had been detected in the IS-14 satellite coming from the area where the antenna of the SAEZ station is installed. Joint tests were performed and it was diagnosed that the station was transmitting the interfering signal, taking temporary corrective measures. In the first week of May the REDDIG Administrator visited the SAEZ station to identify and evaluate the radio frequency sources of interference, and to conduct relevant actions for the normal operation of the station.

2.10 Among actions taken, a new coaxial cable was temporarily installed by another path to the antenna and it was coordinated the sending of SSPA spare equipment to the SAEZ station to replace the one with failure. Also, technical recommendations had to be implemented so as to restore the normal functioning of the station.

2.11 In view of the above, the alternation of operation of the NCC servers could not be performed. However, during short periods of solar conjunction, only the reference carrier itself was switched temporarily from Manaus to Ezeiza.

Implementation of new REDDIG services

2.12 With reference to this activity, the following services were implemented:

- Voice communication tests REDDIG - CAFSAT
- Implementation of private virtual circuits (PVC) for AMHS services:
  Guyana-Suriname
  Brazil-Peru
  Ecuador-Peru

Voice communication tests REDDIG/CAFSAT

2.13 To follow up the SAT/16/16 Conclusion, *ATS voice circuits implementation via REDDIG and CAFSAT VSAT networks*, adopted by the Sixteenth Meeting on the Improvement of Air Traffic Services over the South Atlantic (Recife, Brazil, 2 to 6 May 2011), technical staff from AENA and the Argentinean aeronautical administration conducted in June 2011 a voice communication trial among Las Palmas and the Manaus REDDIG Management Center through the REDDIG Ezeiza (SAEZ) station, with the collaboration of INSA.

2.14 The quality of voice communication with satellite double jump was of 5/5 in both directions. The Ezeiza Digital Communications Center made the necessary configuration in their telephone exchange, allowing automatic switching of a call from the REDDIG towards the CAFSAT. This test demonstrated that it is possible to implement ATS voice circuits between the CAR (Trinidad and Tobago) and SAM Regions (French Guiana and Uruguay), with the AFI Region (Santa Maria, Senegal and South Africa) through the REDDIG and CAFSAT networks. Communications between said States are currently being carried out through international direct dialing (IDD) circuits. These circuits are specified in table CNS 1 C of the CAR/SAM Air Navigation Plan, Volume II FASID (Doc 8733).

Implementation of private virtual circuits (PVC) for AMHS services

Guyana-Suriname

2.15 Since June 2011 operational traffic and satisfactory AMHS service are available between Guyana and Suriname.

Brazil-Peru

2.16 In August 2011 the PVC circuit between Manaus (SBMN) and Lima (SPIM) stations was tested with end-to-end trials between routers at network level. To date no AMHS interconnection tests have been completed among the respective MTA.

Ecuador-Peru

2.17 In November 2011 a PVC between the Guayaquil (SEGU) and Lima (SPIM) stations was created for the AMHS service between both countries. To date no tests have been performed among routers at network level.

Study of the implementation of the new digital network (REDDIG II)

2.18 The most important activities on this study since the last meeting of the REDDIG Coordination Committee to date, were:

- The Seminar/Workshop on New Technologies in Satellite and Ground Networks,

- Development of technical specifications for the REDDIG II,

- Presentation on the process of implementation of REDDIG II to the Twelfth Meeting of Civil Aviation Authorities of the South American Region, and

- The bidding process of the REDDIG II.

Seminar/Workshop on New Technologies in Satellite and Ground Networks

2.19 This event was carried out in Lima, Peru, from 18 to 20 July 2011, attended by 34 participants from 10 States and a Territory of the SAM Region, together with representatives of the United States of America (FAA), the industry (INEO, INSA, ND SatCom, SES, SITA and Telefónica), and ICAO.

2.20 The purpose of the seminar/workshop was to present the latest trends in satellite and ground networks, as well as the technical proposals of the industry (manufacturers, integrators and communications services providers) to the network solution suggested by the study of the new digital network for the SAM Region (REDDIG II).

2.21 The information obtained in the seminar/workshop, as well as the solutions proposed by the companies, were considered very valuable and it was agreed to include them in the technical specifications document to be drawn up for the REDDIG II. A summary of the relevant aspects of the seminar/workshop is included as **Attachment A** to this working paper.

Development of technical specifications for the REDDIG II

2.22 Following up on the action plan for the implementation of the REDDIG II, a technical specifications document was prepared in August 2011 using the standard format of ICAO`s Technical Cooperation Bureau (TCB), that would be in charge of the tendering process.

2.23 The technical specifications document was prepared by two communications experts of the SAM Region, Messrs. Omar Gouarnalusse from Argentina, and Athayde Frauche from Brazil, with the participation of the REDDIG Administrator, the conduction of the CNS Regional Officer of the ICAO SAM Office, and the support of the Brazilian Aeronautical Administration (DECEA) and the Regional Project RLA/06/901.

2.24 The document was circulated to all REDDIG member States requesting their comments by mid-October, 2011. Comments received from Chile and France were processed for their inclusion in the technical specifications.

Presentation on the process of implementation of REDDIG II to the Twelfth Meeting of Civil Aviation Authorities of the South American Region

2.25 The Twelfth Meeting of Civil Aviation Authorities of the South American Region (RAAC12) held in Lima from 3 to 6 October 2011, took note of the activities developed for the implementation of the REDDIG II and approved the commencement of the bidding process for the procurement, installation and commissioning of the new network, as well as the commitment of States to deposit in the course of 2012 the funds required to finance the non-recurrent and recurrent costs involved. In this regard, the meeting adopted the Conclusion RAAC 12/6, *Approval to start the bidding process for the implementation of the new REDDIG II digital network*, included as **Attachment B** to this working paper.

Bidding process of the REDDIG II

2.26 As part of the arrangements made between the REDDIG Administration and the TCB to implement the REDDIG II, it was set up a schedule of activities for the bidding phase and elaboration of tender's evaluation criterion. The technical specifications document was published in the website of the TCB Procurement Section (www.icao.int/procurement) on 4 April 2012, so commencing the bidding process. In this regard, the action plan was amended during the SAM/IG/9 Meeting, and updated in July 2012 as shown in **Attachment C** to this working paper.

2.27 The evaluation of bids was performed by a group of experts of the REDDIG member States (Argentina, Brazil, France (French Guiana), Paraguay and Peru) together with ICAO and the REDDIG Administrator. The experts were nominated by their respective aeronautical authorities in response to the request made by ICAO as a follow-up to Conclusion RAAC 12/6. The results of bids evaluation will be presented with WP/05 of this coordination meeting.

Logistic operations, spare parts management and network maintenance

2.28 Logistic operations, mainly activated by equipment failures in the nodes, entail the delivery of REDDIG equipment or spare parts from the warehouse located at the ICAO Regional Office in Lima or from any other node to the nodes that require them. This include coordination with the manufacturers for repairs required, the payment of transportation and any other costs involved, as well as the support to States on import/export formalities.

2.29 During 2011, there have been nine logistic operations, as shown in **Attachment D** to this paper.

2.30 The 2011 statistics on the number of major attentions to network nodes and their distribution by the type of equipment that gave rise to the attentions, are presented in Attachment E.

2.31 The availability of the network along 2011 is shown in the graphic of Attachment F.

3. **Suggested action**

3.1 The Coordination Committee is invited to:

a) Take note of the information provided;
b) Review the activities undertaken since its previous meeting to date, described in Section 2 and attachments; and
c) Analyze any other aspect deemed necessary regarding this agenda item.

- - - - - -

SUMMARY OF THE OUTSTANDING ACTIVITIES OF THE SEMINAR/WORKSHOP ON NEW TECHNOLOGIES IN SATELLITE AND GROUND NETWORKS

(Lima, Peru, 18 to 20 July 2011)

INTRODUCTION

1.1 The *Seminar/Workshop on New Technologies in Satellite and Ground Networks* was held in Lima, Peru from 18 to 20 July 2011, attended by 34 participants from 10 States and a Territory of the SAM Region, together with representatives of the United States of America (FAA), the industry (INEO, INSA, ND SatCom, SES, SITA and Telefónica), and ICAO.

1.2 The purpose of this event was to present the latest trends in satellite and ground networks, as well as the technical proposals of the industry (manufacturers, integrators and communications services providers) to the network solution suggested by the study of the new digital network for the SAM Region (REDDIG II), prepared with the support of Projects RLA/06/901 and RLA/03/901.

1.3 The study was presented at the SAM/IG/6 meeting (Lima, Peru, 18-23 October 2010), which adopted the Conclusion SAM/IG/6-10 – *Review of the study of a new digital network for the SAM Region*. The study was circulated among all States of the Region requesting their comments, and then it was submitted to the fourteenth meeting of the REDDIG Coordination Committee (Lima, Peru, 16-18 March 2011) for adoption of the network configuration recommended.

1.4 The study presents an analysis of the current status of the REDDIG, the bandwidth requirements to support the aeronautical fixed service, radar data, and the new services foreseen to support air navigation, as well as an analysis of different network configurations (satellite, ground and mixed). Finally, throughout a comparative analysis of networks analyzed, the study proposes a mixed solution (satellite + ground). The Fourteenth Meeting of the REDDIG Coordination Committee (RCC/14), carried out in Lima from 16 to 18 March 2011, approved the network configuration proposed.

1.5 The preparation of the study of the new digital network for the SAM Region, as well as the Seminar/Workshop on New Technologies in Satellite and Ground Networks are part of the regional action plan for the implementation of the new network.

1.6 The agenda of the seminar/workshop was divided into four sessions. A summary of each session is presented below.

2. SUMMARY OF ACTIVITIES CARRIED OUT IN EACH SESSION

SESSION 1

2.1 STUDY OF THE REDDIG II DIGITAL NETWORK

2.1.1 The participants took note of the background that had led to the decision to develop an action plan for the implementation of a new digital network in the SAM Region, the current and future services requirements for the new network, the bandwidth required, and the analysis of the proposed network solutions.

SESSION 2

2.2 NEW TRENDS IN SATELLITE COMMUNICATIONS NETWORKS

2.2.1 Developments in the different satellite access modes (SCPC/MCPC (FDMA), TDMA and CDMA), modulation techniques [16 and 32 APSK (phase and amplitude modulation)], and error correction techniques [Turbo Product Coding (TPC) and Low Parity Density Check (LPDC)] have been described in this session.

2.2.2 In this regard, it was noted that Modems with 16 and 32 APSK modulation systems are already available in the market for video broadcasting applications [DVB-S2 (*Digital Video Broadcasting via Satellite – 2nd generation*), DVB-SH (*DVB via Satellite to Handheld devices*), IPoS (*Internet Protocol Over Satellite*) and ABS-S (*Advanced Broadcasting System via Satellite*)].

2.2.3 Commercial modems have already made full use of 8PSK modulation and Turbo Coding correction techniques for aeronautical applications. These techniques improve the bandwidth efficiency, allowing for transmitting more information in less bandwidth.

2.2.4 With regard to access techniques, the advantages and disadvantages of SCPC/MCPC and TDMA access techniques were presented on a graphic. The CDMA technique uses more bandwidth, complex and expensive modems, and has very few applications.

2.2.5 Concerning the SCPC/MCPC and TDMA, it is observed from the information received that the TDMA satellite access technique would represent the most appropriate technology for more than ten satellite nodes, and for a fully meshed configuration.

2.2.6 Likewise, general aspects concerning the use of the IP and *Frame Relay* protocols in satellite networks for aeronautical applications were presented during this session, as well as the advantages and disadvantages of each of these protocols.

2.2.7 *Frame Relay* access devices are not being updated and in the same manner the satellite modems are also discontinuing the use of Frame Relay. For example, the new ND SatCom modem (IDU 1070) is completely IP.

2.2.8 Based on the information presented and considering the types of aeronautical services that the new SAM digital network will have to support, it is observed that FRAD and MODEM would be required to support the *Frame Relay* and IP protocols.

SESSION 3

2.3 NEW TRENDS IN GROUND COMMUNICATIONS NETWORKS

2.3.1 With regard to new trends in ground networks, it was noted that the technologies most widely used by telecommunications operators are the VPN (*Virtual Private Network*) and the MPLS (*Multi Protocol Label Switching*).

2.3.2 VPN is a generic denomination for customer data networks based on the establishment of tunnels to create virtual channels through a network, being a closed network (the traffic moves exclusively within the VPN, and there is no traffic of data outside), of a transparent service (it does not impose restrictions on the IP numbering policy of the customer). Among the services offered for VPN there are: *Frame Relay*, ATM, X25, SCPC, VSAT.

2.3.3 MPLS is a technology that allows an IP network to provide VPN, permitting customers to build an IP network with private numbering, totally isolated neither from the Internet and from other IP networks of other customers, which provides security with no need for firewalls nor IPSEC as is the case of the VPN over the Internet. It is an efficient technology (does not increase the cost of the IP network and has a minimum wastage of bandwidth).

2.3.4 SITA and Telefónica, the communications services providers attending the event, informed that customers may carry out the management of the information that will be circulated by said networks, and that new services requirements could be introduced with no need to coordinate with the provider if there is sufficient bandwidth to support the new services. Furthermore, a single point of contact would be available 24h/365d.

SESSION 4

2.4 SOLUTIONS PROPOSED BY THE INDUSTRY FOR THE DIGITAL NETWORK MODEL OF REDDIG II

2.4.1 The study on a new digital network for the SAM Region, as was required by the SAM/IG/6 meeting in Conclusion SAM/IG/6-10 – *Review of the study of a new digital network for the SAM Region*, was sent to manufacturers of networks equipment, communications services providers and integrators of communications networks, so that they could present during this seminar/workshop, their possible technological solutions for the implementation of the model suggested in the study.

2.4.2 INEO, SITA, INSA/SES, Telefónica and ND SatCom are the companies that presented their technical solutions for the study sent. It was noted that other companies had been invited, but they informed that could not complete their proposals and thus were not participating in the event.

Solution proposed by INEO

2.4.3 INEO presented as a solution, a mixed network configuration (ground + satellite), as recommended in the study.

2.4.4 Given the types of services that will be supported by the new network, INEO informed that it must be based on a proven technology, with very few revolutionary aspects (as new unproven trends), that may permit the integration of the current technology that supports the existing services, with the one required for the new services to be implanted in the network.

2.4.5 Taking into account the quantity of nodes and the number of links required in each node, INEO considered that the SCPC access technique could be expensive, being advisable keeping the TDMA, which is currently used in the REDDIG. Likewise, recommended the use of BGP for IP routing and MPLS technology for the ground network.

Solution proposed by SITA

2.4.6 SITA proposed the use of its IP VPN platform, which is available worldwide since 1999 in 157 States and 771 cities. This platform currently supports network solutions for aeronautical applications in Europe (PENS), Northern Africa (MENS), the Americas (PANS), Asia (APNS) and Southern Africa (PAS).

2.4.7 The IP VPN SITA service supports the following types of access:

- Ethernet/fiber;
- Dedicated lines;
- Frame relay (IP plug configurable);
- ATM Native IP;
- Bandwidth access from 56Kbps to 155Mpbs.

Depending on the type of access, it can be lower than the physical bandwidth access (not lower than 56k/64k).

2.4.8 Users can carry out the management of the network as well as introduce new services into it without the need to coordinate with the provider, as indicated in Session 3, as long as the information does not exceed the bandwidth installed.

Solution proposed by INSA/SES

2.4.9 INSA/SES presented a comparison between different satellite access techniques and discarded SCPC-DAMA for being technically less appropriate for the new SAM digital network since it is oriented to circuit switching instead of packages. Likewise, discarded the CDMA system for being a more expensive technique, only justifiable for military and security environments.

2.4.10 The proposed solution would be a network with access of the TDM TDMA type. In this regard, it was informed that although the *hub-less* topologies are used for these networks, nowadays there are networks topologies with TDM TDMA access, with simple *hub* versions that cost much less than a *hub-less* TDMA network.

2.4.11 Additionally, INSA informed that in the decision to implant a hub-less system vs. a hub-based system, there are other conditions of major importance, such as:

- The reliability and robustness of the network;
- The network control system;
- Intelligence network distributed;
- Network administration; and
- Technical and logistical integrated support capabilities.

Solution proposed by Telefónica

2.4.12 Telefónica proposed a VPN IP MPLS network as solution, which covers practically almost all States of the SAM Region. In those States where Telefónica is not present, co-ordinations are made with other local communications services providers to ensure coverage.

2.4.13 Telefónica provides access with different bandwidths in the same way as SITA, as well as different classes of classified services, according to the percentage of loss of packages for data transmission (Platinum, Gold, Silver and Bronze), of voice and video.

2.4.14 Users can carry out the management of the network as well as introduce new services into it without the need to coordinate with the provider, as indicated in Session 3, as long as the information does not exceed the bandwidth installed.

Solution proposed by ND SATCOM

2.4.15 ND SatCom considered as solution to the study, the use of a satellite network with TDMA access. In this sense informed that its product Modem Skywan supports multiple services such as real-time radar service, high-quality voice applications (PAMA and DAMA), the transfer of aeronautical messages based on TCP/IP, and also the existing old interfaces, as well as the ground-air communications for the remote VHF stations, high availability, efficient bandwidth utilization at a low operating cost, and a high performance network management system.

2.4.16 Likewise, ND SatCom informed about important considerations when designing a network, such as the use of IP for voice applications, and practical advice at the time of implementing the new SAM digital network.

2.4.17 In this regard, informed that a way to install the new network would be implanting in parallel to the existing network and once in operation, remove the old network. Another way would be doing the installation step-by-step, setting up a node at a time and putting out of the old node. Regardless of the type of installation to consider, it was reported on the need to have additional satellite bandwidth to ensure continuity of existing service.

3. Analysis of the proposed solutions

3.1 The participants analyzed the proposals presented by the communications services providers, network integrators and manufacturers, and taking into account that the following activity would be the development of the technical specifications to implant the new digital network in the SAM Region, considered the following.

3.2 The primary network of the new digital network should be the satellite network, considering the high availability of a satellite-based network. The existing digital network of the SAM Region (REDDIG) has been demonstrated it in the last ten years.

3.3 The ground network should encompass all States of the Region. According to the information presented by the communications services providers, there are some States in the Region where the provider has no presence. In this respect, the regional communications services provider should coordinate with local communications services providers to obtain coverage in those countries, thus possibly increasing the cost of services in such locations.

3.4 Since SAM States approved the mixed (satellite + ground) network solution for the new digital network of the SAM Region, the technical specifications to be prepared would take into account the adopted solution. The implanting of a mixed network (satellite and ground) would take place depending on the estimated cost involved in this solution. The decision would be made at the Twelfth Meeting of Civil Aviation Authorities of the South American Region, to be held in Lima, Peru, from 3 to 6 October 2011.

3.5 When drafting, the technical specifications should include the required performance parameters such as availability, security, integrity, reliability, robustness, management capacity and lifetime of the network equipment.

3.6 Likewise, to ensure network availability, the technical specifications should include the necessary spare parts and appropriate training for the personnel that will be responsible for maintaining the new network.

3.7 Consideration was given to the possibility of reusing some equipment of the existing network, such as amplifiers and antennas. In this sense, companies participating in the bidding process must carry out site visits to confirm such possibility.

3.8 Likewise, it was felt that the technical specifications should include the requirements for installing the new network ensuring service continuity, and the need to have additional bandwidth.

- - - - - - -

APPROVAL TO START THE BIDDING PROCESS FOR THE REDDIG II

Conclusion RAAC/12-6 Approval to start the bidding process for the implementation of the REDDIG II new digital network

In order to give continuity to the activities of the action plan for the implementation of the new digital network (REDDIG II), it is requested to:

a) ICAO start, through the technical cooperation mechanism, the bidding process for the implementation of the REDDIG II planned to be launched in the first quarter of 2012;
b) The member States of the SAM REDDIG schedule in their budgets the expenditures corresponding to the non-recurrent and recurrent cost, as indicated in **Appendix C** to this part of the report; and
c) The member States of the SAM REDDIG provide the required support in order that communications experts of your Administration participate in the bidding process.

APPENDIX C / APÉNDICE C

REDDIG MEMBER STATES/ ESTADOS MIEMBROS DE LA REDDIG	NON RECURRENT ESTIMATE COST FOR REDDIG II (GROUND + SATELLITE NETWORK)/ COSTO NO RECURRENTE ESTIMADO PARA REDDIG II (RED TERRESTRE + SATELITAL)	ANNUAL ESTIMATE RECURRENT COST / COSTO RECURRENTE ESTIMADO ANUAL	
		Average estimate management and satellite bandwidth / Gestión y ancho de banda satelital promedio estimado	Management and ground bandwidth / Gestión y ancho de banda terrestre
Argentina	281,250	40,000	24,000
Bolivia	281,250	30,000	24,000
Brazil (three nodes) / Brasil (tres nodos)	843,750	110,000	72,000
Chile	281,250	38,000	24,000
Colombia	281,250	38,000	24,000
Ecuador	281,250	28,000	24,000
French Guiana (France) / Guayana Francesa (Francia)	281,250	24,000	24,000
Guyana	281,250	24,000	24,000
Paraguay	281,250	24,000	24,000
Peru / Perú	281,250	40,000	24,000
Suriname	281,250	24,000	24,000
Uruguay	281,250	32,000	24,000
Venezuela	281,250	30,000	24,000
Trinidad & Tobago / Trinidad y Tabago	281,250	28,000	24,000
TOTAL US$	**4,500,000**	**510,000**	**384,000**

Attachment C

ACTION PLAN FOR THE IMPLEMENTATION OF A NEW DIGITAL NETWORK (REDDIG II)

Activities	Action to be taken by	Deliverable	Target date	Remarks
1	2	3	4	5
1 Identify current voice and data services requirements, as well as those scheduled to be implemented in the short, medium and long term in the SAM Region, in support of air navigation	SAM/IG Group for the implementation of CNS improvements	List of services requirements in support of air navigation for the SAM Region, including those scheduled for the short, medium and long term	SAM/IG/6	**Completed** Identified in the study for the implementation of the REDDIG II new digital network.
2 Analysis of band width required for the services identified in Activity 1	SAM/IG Group for the implementation of CNS improvements	Amount of band width required to support the requirements specified in Activity 1	SAM/IG/6	**Completed** Identified in the study for the implementation of the REDDIG II new digital network.
3 Determination of costs for the band width increase in REDDIG	SAM/IG Group for the implementation of CNS improvements	Implementation costs of new REDDIG services	SAM/IG/6	**Completed** Identified in the study for the implementation of the REDDIG II new digital network.
4 Study of the new REDDIG technological platform and determination of its cost	SAM/IG Group for the implementation of CNS improvements	Definition of the REDDIG technological platform	SAM/IG/6	**Completed** Identified in the study for the implementation of the REDDIG II new digital network.
5 Study of a ground IP regional network structure supporting the services required and defined in Activity 1, as well as of the band width requirements defined in Activity 2	SAM/IG Group for the implementation of CNS improvements	Definition of a SAM ground IP network model structure	SAM/IG/6	**Completed** Identified in the study for the implementation of the REDDIG II new digital network.
6 Determination of costs for the implementation of Activity 5	SAM/IG Group for the implementation of CNS improvements	Implementation costs of SAM ground IP network structure	SAM/IG/6	**Completed** Estimated costs were identified in the study for the implementation of the REDDIG II new digital network and some communications service providers consulted.

Attachment C

Activities	Action to be taken by	Deliverable	Target date	Remarks
1	2	3	4	5
7 Study on the structure of a mixed (ground and satellite) SAM digital network structure	SAM/IG Group for the implementation of CNS improvements	Model definition	SAM/IG/6	**Completed** Identified in the study for the implementation of the REDDIG II new digital network.
8 Determination of the costs for the implementation of Activity 7	SAM/IG Group for the implementation of CNS improvements	Implementation costs of a mixed (ground and satellite) digital network structure	SAM/IG/6	**Completed** Estimated costs were identified in the study for the implementation of the REDDIG II new digital network and consulted to the industry (manufacturers, integrators and communications service providers)
9 Comparisons between the network infrastructure models specified in Activities 4, 5 and 7	SAM/IG Group for the implementation of CNS improvements	Comparative study between the ground IP satellite network models and mixed (satellite and ground)	SAM/IG/6	**Completed** Identified in the study for the implementation of the REDDIG II new digital network.
10 Determination of regional network infrastructure model, on the basis of results of Activity 9	SAM/IG Group for the implementation of CNS improvements	Final revision of the study of the REDDIG II new digital network	Fourteenth Meeting of the REDDIG Coordination Committee (RCC/14) – Lima, Per, 16-18 March 2011 SAM/IG/7	**Completed** The study of the REDDIG II new digital network was circulated to REDDIG member States and to Panama for comments. Comments were received from Argentina, Brazil, Chile and Panama. The REDDIG RCC/14 Meeting (Lima, Peru, 16-18 March 2011) revised and approved the infrastructure model developed in the study. Also, the SAM/IG/7 Meeting reiterated the items approved in the RCC/14 Meeting.
11 Holding of a Seminar/Workshop on New Technologies for Ground and Satellite Networks	Secretariat	Technological solutions for the new REDDIG II Regional network configuration.	Lima, Peru, 18-20 July 2011	**Completed** In this seminar/workshop, the service providers of communications, integrators and manufacturers presented initial proposals for the implementation of the new digital network

Activities	Action to be taken by	Deliverable	Target date	Remarks
1	2	3	4	5
12 Acceptance process for the implementation of the network infrastructure model determined by Activity 10, through a public bidding process	SAM/IG Group for the implementation of CNS improvements	Acceptance of the REDDIG II network infrastructure model	Fourteenth Meeting of the REDDIG Coordination Committee (RCC/14) – Lima, Per, 16-18 March 2011 SAM/IG/7	**Completed** The REDDIG RCC/14 Meeting (Lima, Peru, 16-18 March 2011) revised and approved the infrastructure model developed in the study. Also, the SAM/IG/7 Meeting reiterated the items approved in the RCC/14 Meeting.
13 Preparation of technical specifications for the implementation of the SAM network infrastructure specified in Activity 10	SAM/IG Group for the implementation of CNS improvements	Technical specifications for the implementation of a SAM network infrastructure	Aug 2011	**Completed** Technical specifications document was performed with the support of Project RLA/06/901.
14 To circulate to the States in the Region the technical specifications for the implementation of the SAM network infrastructure	Secretariat	Approval of specifications for the implementation of the SAM network infrastructure	Sep 2011	**Completed** Circulated to all REDDIG members for their comments.
15 Presentation of the study of the network and of the REDDIG II technical specifications to the Twelfth Meeting of Civil Aviation Authorities of the SAM Region (RAAC12)	Secretariat	Approval to go ahead with the public bidding process through ICAO.	Oct 2011	**Completed** The Twelfth Meeting of Civil Aviation Authorities (RAAC12) approved to begin the bidding process for the implementation of the REDDIG II new digital network, formulated the Conclusion RAAC/12-6.
16 Review of the technical specifications based in the comments made by the States and delivery to the ICAO Technical Cooperation Bureau to start the bidding process.	REDDIG Administration	REDDIG II technical specifications	Jan 2012	**Completed** The final technical specifications were sent to the Technical Cooperation Bureau (Procurement Section) to start the bidding process

Attachment C

Activities	Action to be taken by	Deliverable	Target date	Remarks
1	2	3	4	5
17 Preparation of evaluation criteria for the REDDIG II tenders.	REDDIG Administration and Technical Cooperation Bureau	Evaluation criteria of the tenders	Jan 2012	**Completed** The criterion established for the evaluation of the tenders will be used.
18 Call for an international bidding process for the REDDIG II implementation.	ICAO Technical Cooperation Bureau	Bidding process	Apr 2012	**Completed** The bidding process started on 4 April 2012. The call for tenders was placed in the website www.icao.int/procurement under the number 22501200.
19 Receipt of tenders	Bidding companies	Tenders by bidders	15 Jun 2012	**Completed**
20 Evaluation of the tenders to determine the winning company.	Experts from REDDIG member States and the REDDIG Administration	Tenders evaluated	18-29 Jun 2012	**Completed** The evaluation group was conformed by experts from Argentina, Brazil, French Guiana (France), Paraguay and Peru. Also, the REDDIG Administration (SAM ICAO Secretariat and REDDIG Administrator) participated.
21 Review and approval of the evaluation analysis of the bids and approval of the winning company	Meeting of the REDDIG Coordination Committee (RCC/15)	Considerations and approval of the evaluation of tenders and of the selected winning company	15-17 Aug 2012	**To be performed** All members of the REDDIG that have not been able to participate in the evaluation process shall have the opportunity to consider and approve the evaluation and selection of the winning company.
22 Negotiation process with the winning company	TCB Direction and REDDIG Administration	Negotiation with the winning company	27-29 Aug 2012	**To be performed** Negotiation with the winning company at ICAO TCB Headquarters in Montreal to determine the best value of his offer.
23 Starting the installation of the REDDIG II	Winning company	REDDIG II installation	Nov 2013	**To be performed** The date to start the installation of the REDDIG II depends on the date of signing the contract.
24 Supervision of the REDDIG II installation	REDDIG Administration and REDDIG member States	Supervision of the REDDIG II installation	Nov 2013 – May 2014	**To be performed** The REDDIG member States together with the REDDIG Administration will supervise all REDDIG II installation work.

Activities	Action to be taken by	Deliverable	Target date	Remarks
1	**2**	**3**	**4**	**5**
25 REDDIG II acceptance testing	REDDIG Administration, REDDIG member States and winning company	REDDIG II acceptance	Mar 2014 (Provisional) May 2014 (Final)	**To be performed** The REDDIG member States together with the REDDIG Administration will perform the acceptance testing of the REDDIG II.
26 REDDIG II operation	Winning company	REDDIG II operation	May 2014	**To be performed** All services in operation through the REDDIG II.

- END -

LOGISTICS OPERATIONS DURING 2011

Summary of failures and spare parts administration

FRAD Manufacturer: Memotec

(3)	Motherboard CX950:	(1) SBCT, (1) SVMI, (1) SKED
(4)	Internal Fan:	(1) SPIM, (1) SVMI, (2) SMPM
(1)	Multi I/O Card:	(1) SYGC
(1)	Power Supply:	(1) SUMU
(3)	Universal I/O Card:	(1) SUMU, (1) SMPM, (1) SKED
(1)	DIM E1 Card:	(1) SPIM

MODEM Manufacturer: ViaSat

(5)	Quad Output P.S.:	(1) SAEZ, (1) SBRF, (1) SBMN, (1) SUMU, (1) SPIM
(3)	BPM, Modem, FR:	(1) SBMN, (1) SBRF, (1) SBRF
(1)	24VDC P.S.:	(1) SBRF

SSPA Manufacturer: Paradise Datacom

(3)	BUC/Amplifier:	(1) SBCT, (1) SBMN, (1) SAEZ
(1)	M&C:	(1) SBMN

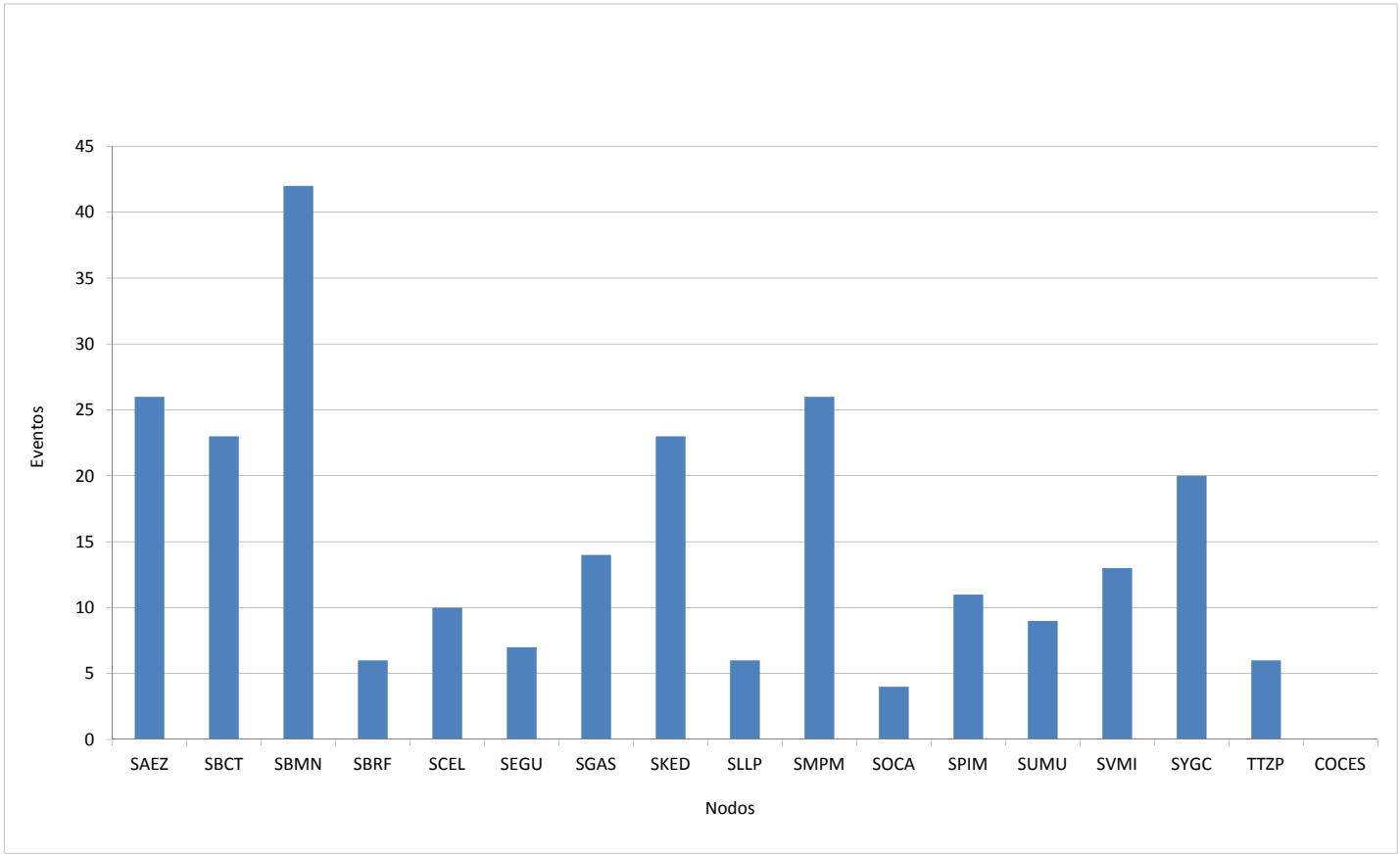
Others REDDIG

(1)	Cable RX (Rack):	(1) SBCT
(1)	Dial-up Modem:	(1) SYGC
(2)	Fan (PC Linux):	(2) SBMN

- - - - - - -

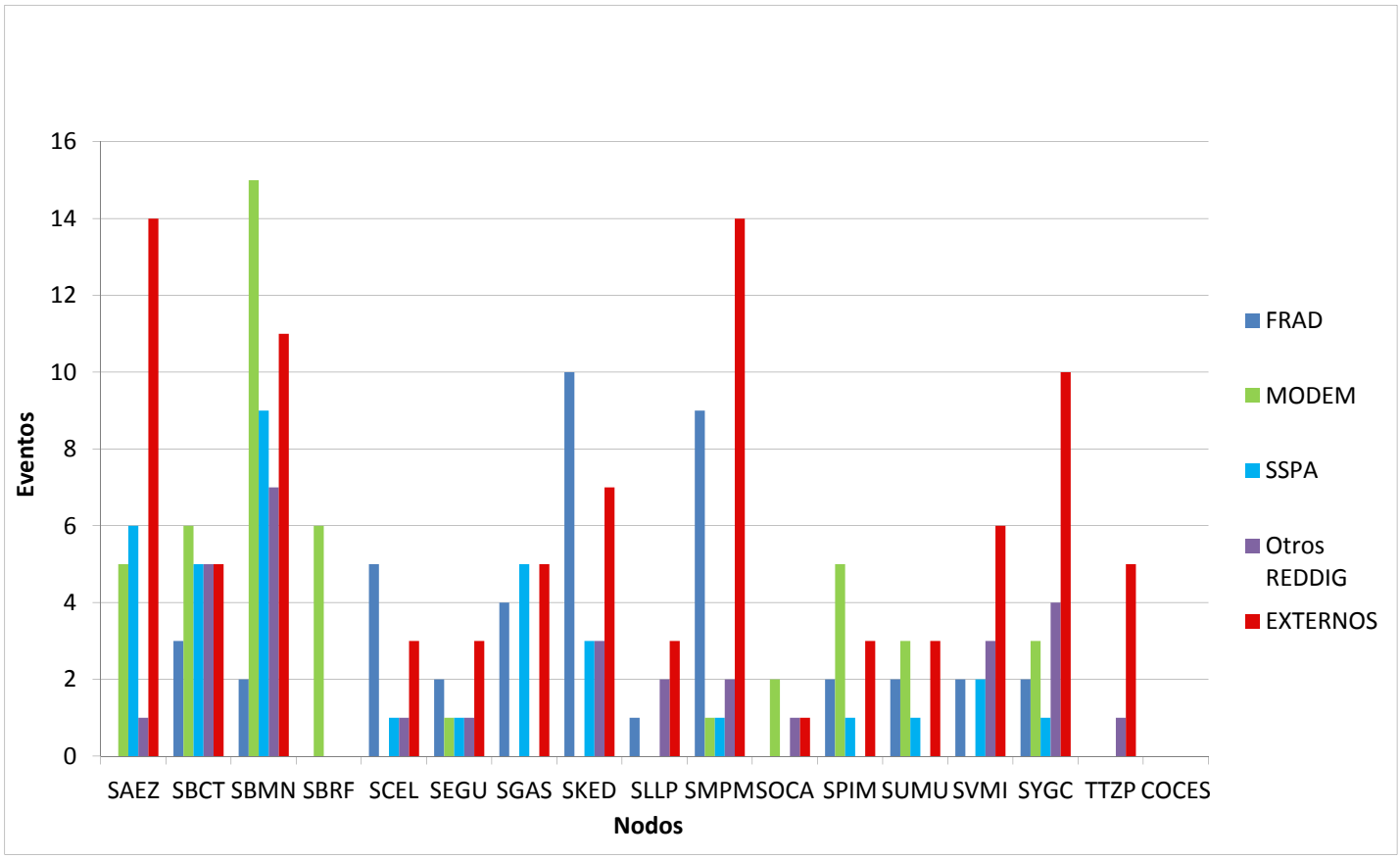
REDDIG 2011

Atenciones a los Nodos / *Maintenance services to Nodes* = 251



REDDIG 2011

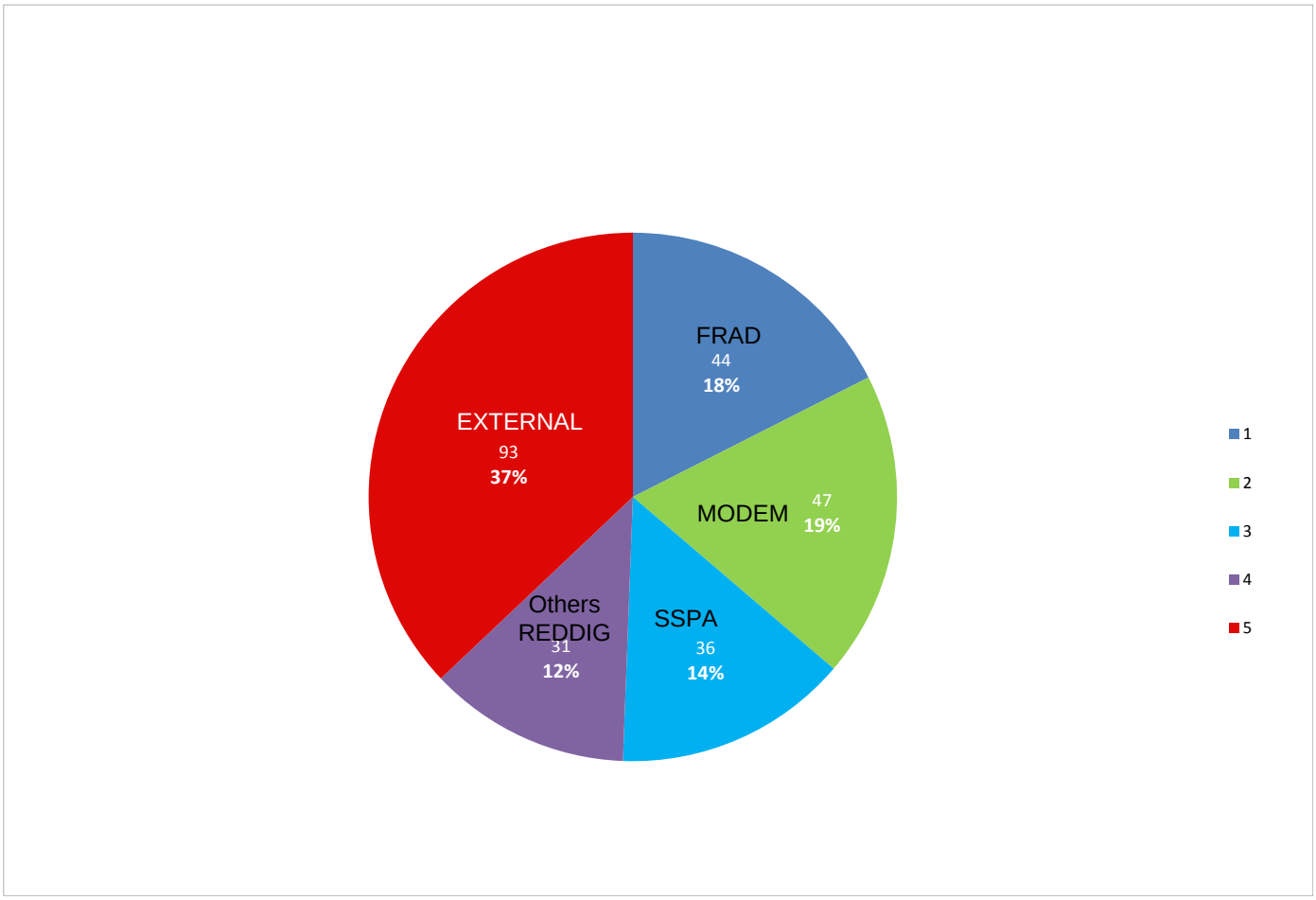
Distribución de las atenciones / *Maintenance services distribution*



REDDIG 2011

Distribución de las atenciones por categoría de equipo /

Maintenance services distribution by category of equipment



- - - - - - -

Disponibilidad de la REDDIG / *REDDIG Network Availability*