



Agenda

Item 1:

REDDIG II performance to date

(Presented by the Secretariat)

SUMMARY	
This study note presents information on the different activities carried out since the last RTO.	
REFERENCES	
<ul style="list-style-type: none"> - Report of the Ninth REDDIG II Technical Operational Meeting (RTO/09) - REDDIG Contract 22502088 and Amendment V to the Contract 22502088; and - Reports of the last REDDIG Coordination Committee Meetings (RCC/24; RCC/25; RCC/26; RCC/27; RCC/28; RCC/29). 	
ICAO Strategic Objectives:	<ul style="list-style-type: none"> <i>A - Operational Safety</i> <i>B - Air navigation capacity and efficiency</i>

1. INTRODUCTION

1.1 This study note summarizes the main activities that have taken place since the Ninth REDDIG II Technical Operational Meeting (RTO/09) (Virtual, 13-14 October 2022), to date. It also reports on the performance of REDDIG II to date. These activities inherent to the operation, support and maintenance of the network were the following:

- a) REDDIG II performance monitoring;
- b) REDDIG II training program;
- c) Operation of REDDIG II and analysis of implementation of new services.

1.2 The logistical aspects of REDDIG are also presented in this study note.

2. DESCRIPTION

2.1 It is stated that we are working at the expected levels of availability and functionality, with 99.9895 % availability in 2022.

2.2 Appendix A of this study note presents the 2022 REDDIG II availability graph.

Logistical Aspects

2.3 It is recalled that the process of definitive replacement with parts of the REDDIG's spare parts lot dates back to RCC/08 of April 2005, which is still in force. Considering that the REDDIG equipment is in the final stage of its useful life cycle, it is feasible that new items may continue to appear

and it will be necessary to continue with the logistical processes for the shipment, repair and replacement of equipment. In addition to the above, the manufacturers, NDSatcom and Terrasat, will no longer manufacture the outdoor and indoor equipment located at the nodes as of 2020. And that there was only a commitment to have spare parts until 2022. After that, it is subject to the availability of the manufacturers.

2.4 In 2022, during RCC/28, an HP server source was delivered to the representatives of the Colombian Administration, which later made it possible to recover the functionality of the server in the Bogotá node.

2.5 REDDIG Management sent the equipment listed in **Appendix B** for factory repair during 2023.

2.6 To date, the equipment listed in **Appendix C** has been sent to the nodes. The respective installations have been and are being coordinated, according to the requirements and availability of each node. The logistical work carried out by the Regional Office staff, who have taken on this task, which tends to have its complexities/particularities, should be emphasized.

2.7 An 80W IBUCs is pending reception at the SAM Office, but it is in Maiquetía, Venezuela, and a 1070 modem is in the process of being shipped from Guayaquil for factory repair. Also, a 1070 modem is in the process of being shipped from Guayaquil for repair at the factory. Two IBUCs from Suriname have been received and shipped to the factory, together with a modem from Asuncion and a modem from Curitiba. We have one modem from Chile with failure, and awaiting shipment; and two IBUCs from Bolivia.

2.8 Regarding cybersecurity, with the acquisition and reception of the Fortigate, Forti Switch, Forti Manager and Forti Analyzer equipment, and the completion of the training courses, the equipment was shipped and distributed to all the planned network nodes during 2023. Currently, there are some administrative and State-specific issues that are delaying the final reception of the equipment at each planned node. During the RTO, the issues related to the commissioning of the equipment will be discussed.

2.9 In relation to these FortiNet equipment, the renewal of the equipment licenses is currently underway. These licenses should be renewed by the end of this year. See **Appendix D**.

2.10 During 2023, at the request of the Administration of Ecuador, FXS boards have been acquired through the project to be installed in the Guayaquil node. This requirement has presented some challenges for the Project, as they are discontinued interfaces. This will serve, temporarily, to cover the operational demand of Ecuador, while waiting for the purchase and modernization of the PABX or voice switching of Guayaquil.

Satellite network spare parts

2.11 As stated in other meetings, the REDDIG II Administration informs the Focal Points that it should be taken into account that REDDIG equipment has exceeded its useful life cycle, which will require more frequent logistical processes for shipping, repair and replacement of equipment.

2.12 For repair of an item, the following expenses are incurred:

- a) Payment to the factory for maintenance performed;
- b) Payment to the transportation company; and
- c) Payment for the services of customs agents.

2.13 The expenses incurred in the maintenance of an item are included in the annual fee of the State that has requested the maintenance intervention of the equipment of its node.

2.14 If the SAM Office Spare Parts Room has an available item with the same characteristics of the equipment sent for factory maintenance, the REDDIG Administration will (temporarily) route the equipment to the node to maintain its availability. Once the original item is returned from the node, the replacement must be returned to the Regional MAR Office.

2.15 During the 24th Meeting of the Regional Project Coordination Committee RLA/03/901, Conclusion RCC/24-1 was approved (see RCC/24 Meeting Report). This conclusion prevents the project management from sending Office spare parts to States that did not send the original failed items for factory maintenance.

2.16 However, in the case where a State, in this situation, requests the purchase of an item, the Office can send a spare part that is in the warehouse (which would become the property of the requesting State), then it will be charged to the annual quota of this State, and the Office would purchase another item that would remain as a spare part of the project.

2.17 As for costs and expenses, all costs and expenses shall be borne by the State requesting the definitive replacement of the spare part.

2.18 In accordance with the guidelines indicated in the project document RLA/03/901, the State Administration will deposit in the Project's account the value of the cost of the spare part, as well as all expenses incurred for the replacement of the spare part. In the event that the project makes payments that could be agreed with the State Administration, these expenses will be reimbursed, including them in the annual installment corresponding to the State.

2.19 It is indicated that the cost of repairing damaged equipment, as well as the replacement of equipment or spare parts, is the responsibility of the State; therefore, these costs are not shared with all REDDIG Member States.

2.20 The inventory of spare parts in the Regional Office warehouse is presented in **Appendix E** of this study note.

Current status of the nodes

2.21 En **Appendix F** to this study note shows the statistics obtained during the year 2022, on Attentions, Breakdowns.

2.22 During the year 2022, the pandemic continued to affect the normal planned activities, having an impact on the nodes, motivated by the particularity of each one, in relation to the availability of personnel, which has not allowed to comply with the preventive maintenance plan established during the previous years. These actions were resumed by applying the same schedule and adjusting it for the year 2023. During 2022 and 2023, priority was and is given to corrective maintenance.

2.23 On the other hand, regarding the REDDIG MPLS network, in 2022, the following nodes were incorporated: Ilopango (03/28, El Salvador, COCESNA), ARSAT (12/13, Benavidez, Buenos Aires), and Madrid (12/5, Madrid, Spain). During the year 2023, the Panama node (01/18) and the Johannesburg, South Africa node (03/09) were added.

2.24 It is reported that, on a monthly basis, a report is sent to Montreal with the availability of the MPLS nodes that were below the 99.7% service availability. Below this SLA parameter, the provider is penalized.

2.25 An annual summary is presented in **Appendix G based on the** amounts paid for unavailability of service during 2022 and the months elapsed in 2023.

2.26 Due to the stability and reliability of the terrestrial network, in most of the nodes (we have exceptions), the terrestrial network was used as the main network and the satellite network became the back-up. See priorities in **Appendix H**.

2.27 Cirion and Intelsat, offer access to their respective web pages, showing the options available to generate or follow up on a ticket, or to obtain important information on aspects related to the terrestrial and satellite network. During the meeting there will be an online sample of the information provided.

2.28 In order to meet new developments in the MPLS network, the Contact Matrix is reviewed and updated annually, clarifying that everything continues to be centralized from the NCC Manaus. See contact matrix in Appendix I.

2.29 With respect to Intelsat, information regarding the frequencies of the carriers in use, as well as other details, is published in **Appendix I. This information has been consulted on several occasions.** This information has been consulted on several occasions.

2.30 At the request of the Administrations of Argentina and Paraguay, an intern was enabled in the Asunción node (extension 5522), assigned to the TWR FT of Encarnación (Paraguay) to facilitate coordination with the TWR FT of Posadas (Argentina). Although this was not a requirement foreseen from the beginning, efforts were made to comply with this requirement.

2.31 During the year 2022, support was provided to the administrations of Argentina and Chile for the exchange of radar data in test mode. Argentina sends radar data from the Malargüe sensor to Santiago, and Chile sends data from the Santiago sensor to Mendoza. Still in test mode and with expectations to continue increasing the exchange of surveillance data between both States according to pre-existing requirements and Memorandum.

2.32 During 2023, support was provided to the administrations of Argentina and Paraguay. The reason was Argentina's request for Paraguay to send surveillance data to the ACC in Cordoba (Argentina). This action took place, but to the best of this Administration's knowledge, due to limitations of the Aircom system in Cordoba, these data are not being able to be presented on console.

2.33 To expand capacity and improve services, an additional intermodal ATS, 2154, has been set up at the Tegucigalpa node.

Network Access to the Nodes

2.34 Durante During 2022 and the months elapsed in 2023, the nodes were distributed, by type of access, as follows:

- **Satellite and MPLS:** Ezeiza; Montevideo; Curitiba; Asuncion; La Paz; Santiago; Lima; Brasilia; Manaus; Recife; Guayaquil; Cayenne; Georgetown; Paramaribo; Piarco; Maiquetia; Bogota.

Subtotal: 17

- **MPLS only:** Rio de Janeiro; Ilopango; Cochabamba; Salt Lake City; Atlanta; ICAO SAM; AIREON; ARSAT (Buenos Aires); Madrid; Panama; Johannesburg; VSAT Santiago; VSAT Maiquetía. **Subtotal: 13**

- **Satellite only:** Tegucigalpa (MEVA antenna). **Subtotal: 1** **MPLS in project:** San Juan, Puerto Rico (costs to be borne by FAA); SITA (costs to be borne by the company). **Subtotal: 2**

Total: 32 Total Operations: 30 Planned: 2

2.35 It should be noted that during 2022, the REDDIG Administration sent FXS boards to the Guayaquil node to reestablish at least some ATS oral circuits that allowed recovering the capacity of the Guayaquil ACC with its adjacent ones.

2.36 To date, the minimum oral ATS services in Guayaquil continue to operate without incident. The issues related to hotline services between Ecuador and Peru are due to situations relevant to internal issues of each State to be discussed and resolved. And the intention, with the incorporation of the cards mentioned at the beginning of the NE, is to increase the number of users.

2.37 Incidents have continued to be reported in relation to changes in the prefixes of the public telephone network in Colombia; although they were reported in a timely manner by the Colombian Administration, there are still cases in which old or outdated dials are used. This generally occurs when, due to some situation that requires the use of contingency means, these inconveniences are detected.

Relocation of the REDDIG II Node from Bogota

2.38 Regarding the process of moving the Bogota node, in an amendment signed on June 28, 2019, the same was finalized on February 5, 2023. For further details, see **Appendix J** for a general summary of the event.

2.39 This activity was carried out by the company INEO ENGIE, contracted for this purpose through the Project and at the request of the Colombian administration.

Node configuration backup

2.40 During 2022 and 2023, *back-ups* of the network equipment configurations of each of the stations were performed, which are stored and available at the NCC in Manaus.

Security

2.41 El The Technical Cooperation Bureau (TCB) carried out the process of acquiring the firewall equipment, as established in Conclusion RCC/22-4 of the Regional Project Coordination Committee RLA/03/901. It should be noted that the purpose of the *firewalls* is to provide security, standardize the equipment and replace the edge *routers* in each of the nodes.

2.42 The planned distribution of the firewalls can be found in **Appendix K**. As will be discussed under "Logistical Aspects", this equipment has been shipped to the States. Although some States have already managed to remove the equipment from their respective Customs, in some cases, the process to remove the equipment is still ongoing. It should be remembered that each State has its own Customs policies, and depending on their complexity, the time to have the equipment at the nodes may vary.

2.43 Likewise, the planned courses were completed and as can be seen through the following link:

<https://www.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2022-RLA03901-FIREWALLS&t=1>

2.44 Considering that the project acquired a FortiAnalyzer and a FortiManager, and that these will be installed at the NCC in Manaus, during the end of 2022 and beginning of 2023, personnel from this Center received virtual training on the administration and configuration of this particular equipment.

2.45 In addition, password changes are made annually to the routers and switches of the stations, in order to maintain active security measures and integrity of the processes and configurations of the equipment. These measures will be reinforced when the firewalls and switches purchased and in the process of being supplied and installed are installed. In case of any intervention by local technical staff, they should contact the NCC and report their activities and request access.

Solar Incidences

2.46 Every year, the process for the notification of solar flares that affect the satellite network is carried out. This phenomenon occurs twice a year and is saved thanks to the geographical redundancy of the NCCs of Manaus and Ezeiza, and the fact of having the MPLS network.

Alternate operation of NCCs and REDDIG Management Center

2.47 Durante During 2022 and so far in 2023, the operation of the NCCs did not alternate from the REDDIG management center in Manaus to the NCC in Ezeiza.

2.48 It is observed that, during short periods of solar conjunction and eventualities, only the reference carrier was temporarily switched from the Manaus NCC to the Ezeiza NCC.

Other information about the nodes and services.

2.49 For a final overview of the status of each node, refer to Appendix L, where the status of each node is briefly described.

2.50 For P1/AMHS connections, see Appendix L.

Temporary AFTN circuit SPIM - SUMU

2.51 March 2022, at the request of Uruguay and Peru, a temporary AFTN circuit was established between the Lima COM Center and Montevideo COM Center, to replace the AFTN circuit between the Ezeiza COM Center and Montevideo COM Center, which was discontinued because the new system at the Ezeiza AMHS COM Center no longer supports AFTN users (no gateway implemented).

2.52 At present, this circuit has been disabled, since P1/AMHS connections have been established between Uruguay and Argentina, Brazil and Peru. It should be noted that Uruguay added one more connection to the ones it already had, and that, with these connections, the SAM Region no longer uses AFTN connections between its States. This is a milestone that technologically accompanies the new requirements, facilitating the implementation of new applications.

REDDIG Telephone Directory

2.53 The REDDIG Administration requires the focal points, as it does annually, to update the telephone directory (ATS and Administrative), or when there are modifications. In this regard, it is reminded that this information is subject to the operational documents/letters of agreement between States and that any modification, in addition to being informed and coordinated with the REDDIG administration, must be incorporated into the official documentation of the States and be communicated through official channels.

2.54 It is reminded and reiterated, to inform the different NHA units about the alternatives available for coordination with their counterparts, considering the administrative telephone services, messaging service, and oral ATS of the REDDIG. See Appendix M.

Improved coordination

2.55 During the year 2022, it was reiterated and requested to inform the REDDIG Administration and the nodes involved of any technological changes, failures or configurations in the States' systems that affect the services provided by REDDIG II (PABX, Voice Switching, MTA, automated systems, surveillance data exchange, etc.). This request is reiterated in this RTO.

2.56 It is recalled that the Brazilian administration has provided a cell phone (No. +55 92 8412-6738) to the NCC technical staff, which allows access to messaging (WhatsApp, Signal, Telegram, etc.); a tool that has greatly facilitated coordination. Currently, all NCC personnel use this complementary means, and the Administrator uses his own cell phone service to meet this need for immediate communication.

REDDIG Training Program

2.57 During the year 2022, due to the pandemic, the planned training could not be carried out.

2.58 During 2023, they were:

- a) **Recurrent on REDDIG Operation and Maintenance:**
It is a regular task for the REDDIG Administrator to conduct this training during his annual visits to the nodes. During this year, training was conducted in Cayenne (French Guyana), and in Piarco (Trinidad & Tobago). An activity is still pending in the Guayaquil node (Ecuador);
- b) **Course on security policies and firewall configuration and Advanced course on firewall management and monitoring:**
In the first case, a basic course on Fortigate was given at the Regional Office by Fortinet; and remotely, also given by the same manufacturer, on Forti Analyzer and Forti Manager to the staff of NCC Manaus.
- c) **Training on IP packet analysis with sniffer (RADAR, AMHS, etc):**
An initial activity is planned after the RTO with the RTO participants.

Antivirus software on NMS servers

2.59 As is done annually, the antivirus renewal process was completed for 23 NMS servers, with a 1-year license. The renewal must be effective as of December 31 of each year. The antivirus update is performed by NCC Manaus personnel during the month of January of each year.

Corrective maintenance

2.60 To be dealt with under Agenda Items 2 and 3.

Preventive maintenance

2.61 The intention is to complete this task during the year 2023, paying special attention to the RF part of each station. Only maintenance actions were performed, at software level and by remote access. See Appendix N.

Visit to the nodes

2.62 During the year 2023, three missions were carried out by the REDDIG Administrator, one to Bogota, requested by the Colombian Administration, and related to the move of the node; a mission to Cayenne, requested by the French Guyana Administration; and a mission to Piarco, Trinidad & Tobago, planned by the Project as part of the annual technical visits. A mission to Guayaquil, Ecuador, is pending as part of the two annual visits to the nodes that are expected to take place during the month of November of this year.

2.63 In relation to this issue, Conclusion RTO/8-2 on the need for technical visits by the REDDIG Administrator, which were also approved by the RLA/03/901 Project Coordination Committee, is maintained.

2.64 Consequently, it is proposed that the REDDIG Administrator continue with the two missions. These would be to the nodes of Paramaribo, Suriname, and Carrasco, Uruguay.

Analysis of REDDIG II Performance Enhancement Requirements

2.65 During 2022 and 2023, the analysis of issues related to security, the inclusion of additional nodes inside and outside the Region, the inclusion of new services, interconnections between Regions, the useful life of the equipment that makes up the current REDDIG and possible actions were continued.

2.66 In this regard, work is being done on a platform based on the terrestrial network, taking into account known factors (cost/benefit, delay, jitter, throughput, latency, error rate, interaction of factors, etc.). This has led to reconsider whether the satellite network should continue to be considered as the main medium. In this sense, in some cases, it has been tested that all services are transported by the terrestrial network as the main medium, with very positive results.

Support to the Extra-Regional Interconnection Coordinations

2.67 In 2022 and 2023, support was provided to Uruguay, Brazil, Spain, South Africa, COCESNA, FAA, Panama, Venezuela, Argentina, Peru and AIREON to achieve P1/AMHS interconnections.

2.68 The Regional Office actively participates in the interconnection processes of AMHS systems in the Region, as well as in different services exchanged among the States, such as tests with the OPMET Bank in Brasilia, exchange of surveillance data, provision of ADS B-satellite data providers with lower costs, etc. It was also reported that there is collaboration in different situations that arise in each State in relation to services and systems, which are often external to REDDIG.

2.69 We usually collaborate with all available tools in order to provide the necessary support with all actions aimed at achieving interconnections, exchanges, transport of different services and

information. Likewise, with actions aimed at information analysis, traffic capture, etc., that allow finding solutions to difficulties arising between the exchanged services, as well as coordination and joint tasks with the MEVA Administrator, and networks of other Regions, etc.

2.70 Coordinated actions were also carried out with INTELSAT in relation to interferences, measurements and antenna repointing at the time of transponder migration (particularly with the Brasilia node).

3 Suggested actions

3.1 Coordination Committee is invited to:

- a) take note of the information provided;
- b) to analyze the activities attended to in RCC/29 to date;
- c) deliberate on the issues presented and others deemed necessary.

- End -