Agenda Item 3: **Report of the activities carried out since the last meeting of the Coordination Committee**

REPORT OF THE ACTIVITIES CARRIED OUT SINCE THE LAST MEETING OF THE COORDINATION COMMITTEE

(Presented by the Secretariat)

SUMMARY

This working paper presents information on progress made in the performance of the activities agreed at the last meetings of the Coordination Committee, as part of 2023 work plan.

REFERENCES

- Contract REDDIG 22502088 and Amendment II to Contract 22502088; and Amendment IX to Contract 22501200
- Reports of the last meetings of the REDDIG Coordination Committee (RCC/24; RCC/25; RCC/26; RCC/27; RCC/28 y RCC/29).

ICAO strategic objectives:	*A – Safety* *B - Air navigation capacity and efficiency*

1. Introduction

1.1 The main activities agreed upon at the last meetings of the Coordination Committee that were performed in 2023 in relation to the operation, support and maintenance of the network were as follows:

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

2. Description

REDDIG II PERFORMANCE MONITORING

2.1 It is noted that availability and functionality levels of the operation are as expected, with 99.9918% availability in 2023. See **Appendix A**.

Logistics aspects

2.2 Logistics movements during 2023 are summarized in **Appendix B**.

2.3 The reception of the following equipment is pending at the SAM Office: an 80W IBUC from Maiquetía node, a 1070 modem from Guayaquil node and a 1070 modem from the Santiago node

2.4 In reference to cybersecurity, the Fortigate, Forti Switch, Forti Manager and Forti Analyzer equipment were sent and distributed to all nodes in the network. Currently, in some particular cases, there are some administrative issues and issues of a particular nature to each State, which delay the final reception of this equipment at each planned node.

2.5 In relation to these FortiNet devices, the renewal of the equipment licenses is currently being managed. They are due to be renewed this year. See **Appendix C**.

2.6 Another issue is that, at the request of the Ecuadorian Administration, FXS boards were acquired through the project, which were installed in the Guayaquil node. During the mission to the Guayaquil node, and together with the local staff, it was possible to recover the operational capacity to 100% of the oral ATS services of the ACC Guayaquil.

Satellite network spare parts

2.7 The REDDIG Administration reminds the Focal Points to take into account that the REDDIG equipment has exceeded half of its useful life cycle, so it is normal for new features to appear. This involves logistical processes that involve, in general, the shipping, repair, and replacement of equipment, most often.

2.8 To repair an item, the following expenditures are incurred:

a) Payment to the factory for maintenance performed;
b) Payment to the transport company; and
c) Payment to customs agents for their services.

2.9 Costs incurred in the maintenance of an item will be included in the annual fee to be paid by the State that has requested maintenance for the equipment of its node.

2.10 In accordance with the guidelines indicated in project document RLA/03/901, the State Administration shall deposit in the Project account the value of the cost of the spare part, as well as all expenses incurred for the replacement of the spare part. In those cases where the project makes payments, which could be agreed with the State Administration, these will be reimbursed by including them in the annual fee corresponding to the State.

2.11 It is emphasized that the cost of repairing damaged equipment, as well as the replacement of equipment or spare parts, is borne by the State, therefore, they are not costs shared with all REDDIG Member States.

2.12 **Appendix D** to this working paper presents the inventory of spare parts in the Regional Office depot.

Status of the nodes

2.13 **Appendix E** to this working paper shows statistics obtained during the year 2023 on service

provided and faults.

2.14 During 2023, the nodes of Panama (18/01) and Johannesburg (09/03) were incorporated into the MPLS network.

2.15 It is reported that, on a monthly basis, a report is sent to the Directorate of Capacity Development and Implementation (CDI), with the availability of the MPLS nodes in relation to the provision of service. It is recalled that the provider is penalized on those nodes that were below the required SLA (99.7%).

2.16 It should be mentioned that Contract No. 22502088 - Ground Network (MPLS based - 5/1 Mbps) services for the SAM Digital Network (REDDIG II) - 1 February 2021 until 31 December 2024 is in force..

2.17 **Appendix F** contains an annual summary of the amounts paid for non-availability of the service.

2.18 Cirion and Intelsat provide access to the respective websites, showing the options available to generate or track a ticket, or to obtain important information on aspects related to the ground and satellite networks.

2.19 To deal with news of the MPLS network, regular contact is maintained with the provider. This makes it possible to improve problem-solving processes, and to be able to anticipate unwanted situations.

2.20 During 2023, support was given 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 was carried out, but according to the Administration's understanding, due to limitations of the automated system in Cordoba, this data cannot be presented in a console.

2.21 Likewise, in order to expand capacity and improve services, a new ATS internal (2154) has been set up at the Tegucigalpa node.

2.22 In addition, with the incorporation of the Panama node, a router with the capacity to enable voice circuits was shipped. This has made it possible for Panama to have, since that time, seven (7) operational oral ATS. This has made it possible to recover and improve coordination capacities with different users in Colombia, and in the States that are part of REDDIG.

2.23 In addition to the above, it should be mentioned that in the Rio de Janeiro node there are four (4) oral ATS, and in the Johannesburg node there are two (2) oral ATS.

2.24 Finally, it should be mentioned that RTO/10 was held at the Regional Office's facilities at the end of 2023. During the meeting, different issues of a purely technical nature were discussed, as well as others of interest to the participants. All the information related to RTO/10 is available on the Regional Office's website, through the following link:

https://www.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2023-RLA03901-RTO10&t=1

Network access to nodes

2.25 During 2023, the nodes were distributed, by type of access, as follows:

- **Satellite and MPLS:** Ezeiza; Montevideo; Curitiba; Asunción; La Paz; Santiago; Lima; Brasilia; Manaus; Recife; Guayaquil; Cayenne; Georgetown; Paramaribo; Piarco; Maiquetía; Bogotá. **Subtotal: 17**

- **Only MPLS:** Rio de Janeiro; Ilopango; Cochabamba; Salt Lake City; Atlanta; ICAO SAM; Aireon; ARSAT (Buenos Aires); Madrid; Panamá, Johannesburg. **Subtotal: 11**

- **Only satellite**: Tegucigalpa (MEVA antenna). **Subtotal: 1**

- **MPLS in the process of being installed**: San Juan (Puerto Rico). **Subtotal: 1**

- **MPLS in project stage**: SITA. **Subtotal: 1**

Total: 31 Total operational: 29 In process: 1 In project stage: 1

Transfer of the REDDIG II Node in Bogotá

2.26 Regarding the process of moving the Bogotá node, it was finalized on February 5, 2023. For further details, see **Appendix G** for a general summary of this work.

2.27 The execution of this activity was in charge of the company INEO ENGIE, contracted for this purpose, through the Project, and at the request of the Colombian administration.

Node configuration back-up

2.28 In 2023, back-ups were made of network equipment configurations, for each station, which are stored and available at the Manaus NCC.

Security

2.29 The Directorate of Capacity Development and Implementation (CDI) 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 firewalls is to provide security, standardize equipment, and eventually replace edge routers on each of the nodes.

2.30 The intended distribution of FortiNet devices is detailed in **Appendix H**. As stated in "Logistic aspects", this equipment was sent to the States. Although some States have already managed to remove the equipment from their respective Customs, this process is still ongoing in two States.

2.31 In addition, it is worth mentioning that, annually, password changes are made to the routers and switches of the nodes, in order to maintain active security measures and integrity of the processes and configurations of the equipment. These measures will be reinforced when the purchased firewalls and switches are installed.

Solar flares

2.32 Solar flares affecting the satellite network are reported every year. This phenomenon occurs twice a year and is resolved by virtue of the geographical redundancy of the Manaus and Ezeiza NCCs, and the availability of the MPLS network.

Alternating operation of NCCs and the REDDIG Management Centre

2.33 During 2023, the alternation of the operation of the NCCs and the REDDIG management center in Manaus to the NCC in Ezeiza was not carried out.

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

Otras informaciones sobre los nodos y servicios.

2.35 For this item, it is important to highlight the evolution of P1/AMHS connections with the use of REDDIG as a multi-service platform. See **Appendix I**.

Mejoras en las coordinaciones

2.36 During the year 2023, it was reiterated and requested to inform the REDDIG Administration and the nodes involved, of the technological changes, failure situations or configurations that are made in the systems of the States, and that affect the services provided through the REDDIG (PABX, Voice Switching, MTA, automated systems, exchange of surveillance data, etc.). This request is reiterated in this meeting.

2.37 It is recalled that the Brazilian administration has provided a cell phone (No. +55 92 8412-6738) to the technical staff of the NCC, which also allows access to messaging (WhatsApp, Signal, Telegram, etc.). This tool has considerably facilitated coordination. Currently, all NCC staff use this complementary medium, and the Network Administrator uses his own cell phone service to address this immediate communication need.

REDDIG II TRAINING PROGRAMME

2.38 In view of the pandemic and other factors, the following can be reported regarding training courses scheduled for 2023:

a) **Recurrent training on REDDIG operation and maintenance**:
It is a regular task for the REDDIG Administrator to carry out this training during his annual visits to the nodes. During 2023, this type of training was held in Piarco (Trinidad & Tobago), and in Guayaquil (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 held at the Regional Office (2022), delivered by Fortinet, which was attended by only representatives from 5 States. Also, a virtual course on Forti Analizer and Forti Manager was given virtually, by the same manufacturer, to two technicians from NCC Manaus, a technician from NCC Ezeiza, and the network administrator;

c) **Training for the Manaus NCC staff on IP packet analysis using *sniffer* (RADAR, AMHS, etc.)**:
Some concepts were discussed during the RTO/10, but it is necessary to analyze the possibility of conducting specific training during 2024, subject to approval by RCC/30.

Antivirus software on NMS servers

2.39 As it is done annually, the process for the renewal of the antivirus for 23 NMS servers was carried out, with a license for 1 year. The renewal must be effected from December 31 of each year. The antivirus update was carried out by NCC Manaus staff during the month of January 2024.

Corrective maintenance

2.40 Although different tasks related to this item are carried out, the work in the Recife node stands out, in the opportunity to solve a problem in the satellite station, as a result of finding news in the antenna guide.

Preventive Maintenance

2.41 We worked on the same work plan that has been used since 2018. It was complied with, paying special attention to the RF part of each station. In general, physical maintenance actions were carried out, at the software level and by remote access.

Visit to the nodes

2.42 During 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 Piarco, Triniad & Tobago, and another to Guayaquil, Ecuador. The latter two are planned by the Project as part of the annual technical visits.

2.43 In relation to this issue, and in accordance with what was agreed during RTO-10, it is proposed to continue with the two missions per year.

Analysis of the requirements for the improvement of REDDIG performance

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

2.45 In this sense, and taking into account that the terrestrial network presents better performances, in relation to critical parameters for traffic exchange (cost/benefit, delay, jitter, throughput, latency, error rate, interaction of factors, etc.); It has been concluded that all services will be transported mainly through this network.

2.46 It is important to mention that support has been given to the intention to carry out the exchange of radar data between Peru and Chile. In this regard, Chile has reported on the use of the "Stealth" converter to filter military flights.

Support for the coordination of extra-regional interconnections

2.47 In this regard, during 2023, the support provided to Brazil, Spain, South Africa, COCESNA, FAA, Panama, Venezuela, Peru, and AIREON to be able to carry out P1/AMHS interconnections and ADS-B Satellite data transport, and in some cases, also enable voice services, stands out.

2.48 The Regional Office has an active participation in the processes of interconnection of AMHS systems in the Region, as well as in the exchange of different services between the States; such as,

for example, tests with the OPMET Bank of Brasilia and exchange of information in new formats of meteorological messages, exchange of surveillance data, provision of data through Space-based ADS –B providers (which has allowed to reduce costs), future VoIP deployments, etc. It was also reported that collaboration is carried out in different situations that arise, in relation to services and systems, and that many times they are external or external to REDDIG.

3 Suggested action

3.1 The Coordination Committee is invited to:

a) take note of the information provided herein;

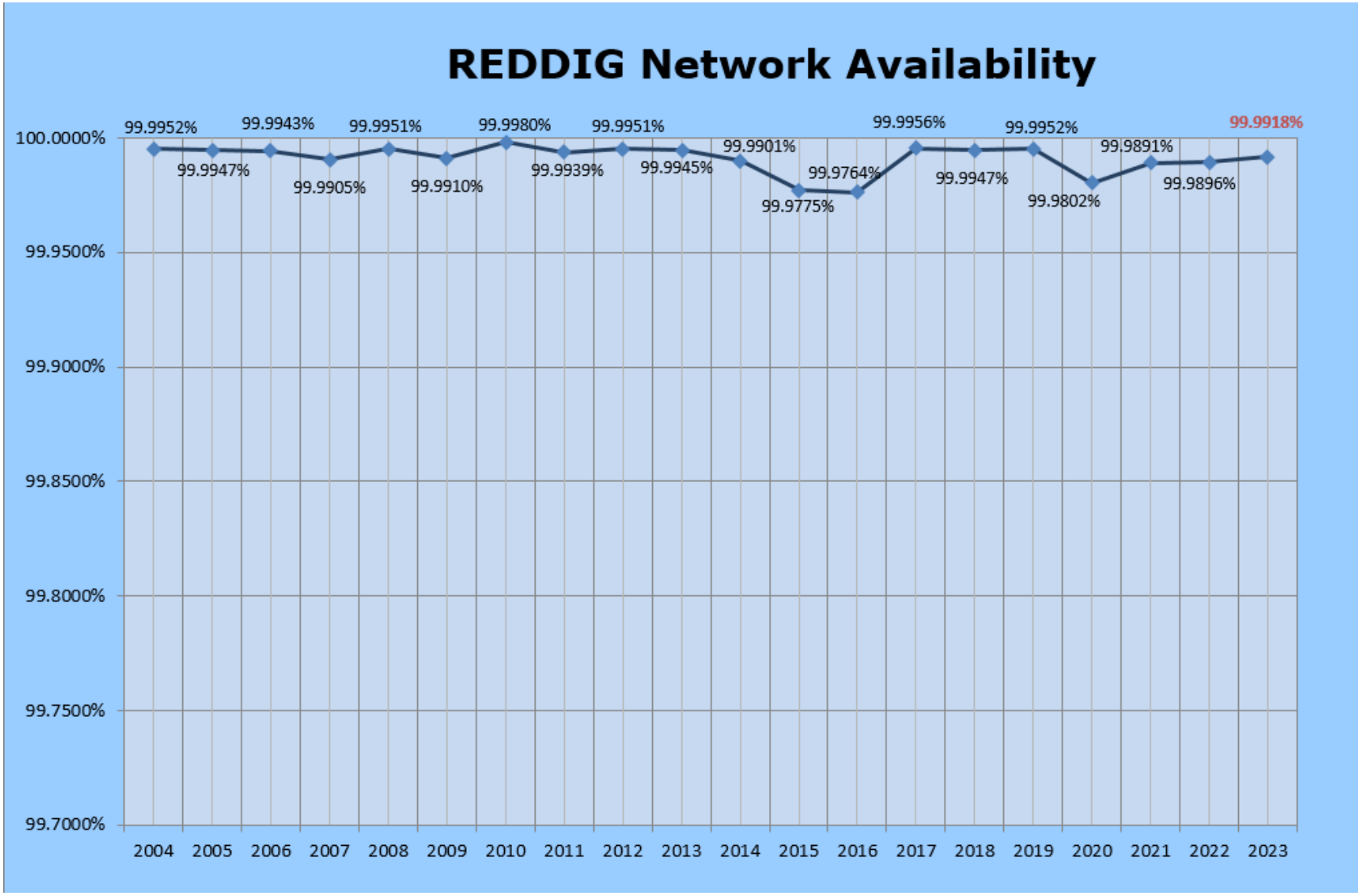
b) review the activities carried out since RCC/29, and the relevant appendices of this working paper; and

c) discuss the issues presented and others it may deemed appropriate.

- End -

APÉNDICE / APPÉNDIX A

Disponibilidad de la REDDIG / REDDIG Availability



APÉNDICE B / APPENDIX B

Movimientos Logísticos / Logistic Movements

EQUIPOS ENVIADOS PARA REPARAR EN FÁBRICA DURANTE 2023 / EQUIPMENT SHIPPED FOR FACTORY REPAIR DURING 2023

MODEM SKYWAN 1070		
EQUIP.	**S.N.**	**NODO / NODE**
IDU 1070B	#00:40:71:F0:50:FC	Paramaribo (Surinam)
IDU 1070B	#00:40:71:F0:51:26	Paramaribo (Surinam)
IDU 1070B	#00:40:71:F0:50:AE	Curitiba (Brasil)
IDU 1070B	#00:40:71:F0:50:E4	Asunción (Paraguay)

EQUIPOS RF TERRASAT / TERRASAT RF EQUIPMENT		
IBUC 80W	TE 5022339/59	Paramaribo (Surinam)
IBUC 80W	TE 5022357	Paramaribo (Surinam)

EQUIPOS ENVIADOS A LOS NODOS RESPECTIVOS DURANTE 2023 / EQUIPMENT SHIPPED TO THE RESPECTIVE NODES DURING 2023

MODEM SKYWAN 1070		
EQUIP.	**S.N.**	**NODO / NODE**
IDU 1070B	#00:40:71:F0:51:02	Cayena (Francia)
IDU 1070B	#00:40:71:F0:52:22	Maiquetia (Venezuela)
IDU 1070B	#00:40:71:F0:51:C2	Recife (Brasil)
IDU 1070B	#00:40:71:F0:51:C2	spare (OACI)
IDU 1070B	#00:40:71:F0:2C:3C	La Paz (Bolivia)
IDU 1070B	#00:40:71:F0:2C:3C	La Paz (Bolivia)

EQUIPOS RF TERRASAT / TERRASAT RF EQUIPMENT		
IBUC 80W	TE 5022353	Bogotá (Colombia)
IBUC 80W	TE 5022357	Cayena (Francia)
IBUC 80W	TE 5022342	Recife (Brasil)
RX 1+1	TE 6010447	Cayena (Francia)
RX 1+1	TE 6010441	La Paz (Bolivia)

APÉNDICE C/ APPÉNDIX C
Licencias equipos Fortinet / Fortinet equipment Licences

	Serial Number	Product Model	Description	Unit Expiration Date	Registration Date
1	FAZ3HGTA22000721	FortiAnalyzer 300G	ICAO SAM	2024-12-12	2022-12-13
2	FCTEMS8822008827	FortiClient EMS	FortiClient EMS Cloud	2023-12-14	2022-12-14
3	FGT61FTK21010597	FortiGate 61F	ICAO SAM	2023-12-03	2022-12-11
4	FGT61FTK21011243	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
5	FGT61FTK21012420	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
6	FGT61FTK21012456	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
7	FGT61FTK21012472	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-08
8	FGT61FTK21012479	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
9	FGT61FTK21012486	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
10	FGT61FTK21012609	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
11	FGT61FTK21012851	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
12	FGT61FTK21012861	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
13	FGT61FTK21012911	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
14	FGT61FTK21012919	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
15	FGT61FTK21012948	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-08
16	FGT61FTK21012961	FortiGate 61F	ICAO SAM	2023-12-04	2023-03-13
17	FGT61FTK21012992	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
18	FGT61FTK21013002	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
19	FGT61FTK21013041	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
20	FGT61FTK21013141	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
21	FGT61FTK21013176	FortiGate 61F	ICAO SAM	2023-12-04	2023-03-13
22	FGT61FTK21013222	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
23	FGT61FTK21013226	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
24	FGT61FTK21013385	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
25	FGT61FTK21013420	FortiGate 61F	ICAO SAM	2024-12-03	2022-12-11
26	FGT61FTK21013443	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
27	FGT61FTK21014241	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
28	FGT61FTK21014260	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
29	FGT61FTK21014399	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
30	FGT61FTK21014448	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
31	FGT61FTK21014515	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
32	FGT61FTK21014533	FortiGate 61F	ICAO SAM	2023-11-25	2022-11-25
33	FGT61FTK21014551	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
34	FGT61FTK21014558	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
35	FGT61FTK21014571	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
36	FGT61FTK21014583	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
37	FGT61FTK21014768	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
38	FGT61FTK21014782	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
39	FGT61FTK21014824	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09
40	FGT61FTK21014901	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
41	FGT61FTK21014935	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-09

42	FGT61FTK21015068	FortiGate 61F	ICAO SAM	2023-12-04	2022-12-11
43	FMG2HGTA22000266	FortiManager 200G	ICAO SAM	2024-12-15	2022-12-16
44	S124EFTQ22002370	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
45	S124EFTQ22002371	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
46	S124EFTQ22002376	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
47	S124EFTQ22002377	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-13
48	S124EFTQ22002381	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
49	S124EFTQ22002383	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
50	S124EFTQ22002389	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
51	S124EFTQ22002413	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
52	S124EFTQ22002415	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
53	S124EFTQ22002418	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
54	S124EFTQ22002419	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
55	S124EFTQ22002420	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
56	S124EFTQ22002427	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
57	S124EFTQ22002458	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
58	S124EFTQ22002464	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
59	S124EFTQ22002617	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
60	S124EFTQ22002619	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
61	S124EFTQ22002625	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
62	S124EFTQ22002629	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
63	S124EFTQ22002630	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-13
64	S124EFTQ22002635	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14
65	S124EFTQ22002840	FortiSwitch 124E FPOE	ICAO SAM	2023-12-05	2023-03-14

APÉNDICE D / APPENDIX D

Repuestos REDDIG II 2022 / REDDIG II Spare Parts

Description	Qty	Unit Price USD	Total Price USD
INDOOR Equipment			
~~IDU 1070 19¨ NS + PS AC~~	~~1~~	20,664.00	20,664.00
~~License Key Mesh Topology~~		included	
GORGY TIMING Equipment			
~~GPS Master Clock – RT9s including on outdoor GPS~~	1	3,289.00	3,289.00
Antenna and cable			
GPS standalone outdoor Antenna for RT9s (without cable)	1	937.00	937.00
LAN Port Server			
NPORT 5610-8	1	1,230.00	1,230.00
10 MHz Redundancy Equipment			
BIAS-T switch (10MHz redundancy system)	1	2,125.00	2,125.00
Passive DC-Block (Power injector 10MHz pass)	4	542.00	2,168.00
Passive DC-Block (RF Bandwidth)	4	130.00	520.00
Passive Splitter (2 Port RF Bandwidth)	2	265.00	530.00
Spare Parts for HPE PROLIANT DL160 Server			
Fans for HPE PROLIANT DL160 Server	~~5~~ 2	124.00	1,240.00
Hot-Plug HP Midline HDD 500GB 7.2K SATA	2	405.00	810.00
OUTDOOR Equipment			
RF Equiment			
~~IBUC 80W~~	~~1~~	18,653.00	18,653.00
~~Tx 1+1 switching system~~	~~1~~	8707.00	8707.00
~~Rx 1+1 switching system~~	~~1~~	9,523.00	9,523.00
Waveguide Switch (CPRG flange) + Control cable	1	3,528.00	3,528.00
LNB with external 10MHz reference	1	804.00	804.00
RF filter (for LNB path)	1	676.00	676.00
N-Female Type coaxial connector (for CNT/LMR-400 Type coaxial cable)	4	45.00	180.00

N-Male Type coaxial connector (for CNT/LMR-400 Type coaxial cable)	4	44.00	176.00
N-Male Type coaxial connector (for CNT/LMR-600 Type coaxial cable)	4	67.00	268.00
EQUIPOS Y PIEZAS DE REPUESTO EN GENERAL			
~~Modem Satelital~~	~~1~~		
Cable de energia	1		
Tarjeta MOD	1		
Tarjeta SIC/DEMOD	1		
Tarjeta FPG	1		
Tarjeta UIM	1		
Cable de consola	1		
Cable de RF N-SMA Macho	1		
~~ROUTER Cisco 2901~~	~~1~~		
Two port Async-Sync Serial WAN interface card	1		
Two port Async-Sync Serial WAN interface card	1		
~~two port voice interface card FXS~~	~~1~~		
~~ROUTER Cisco 2911~~	~~1~~		
24 PORT RJ45 PATCH PANEL	1		
01 TARJETA EVM-HD TELEFONICO	1		
Cable serial CISCO V.24 DTE DB25	1		
Cable serial CISCO V.24 DCE DB25	1		
Cable telefonico RJ11 cross over	1		
~~High density 8 port analog and digital extension module~~	~~1~~		
~~ROUTER Cisco 2901~~	~~1~~		
Two port Async-Sync Serial WAN interface card	1		
~~two port voice interface card FXS~~	~~1~~		
Cable serial CISCO V.24 DCE DB25	1		
~~Rx 1+1~~	~~1~~		
~~Handheld Terminal with 2 m cable~~	1		
~~Accesorios para RX 1+1~~	1		
~~Cables de energia~~	2		
~~Cable Coaxial de RF con conectores tipo N 6m.~~	1		
~~Cable de Gestion para LNB~~	1		
~~Cable Coaxial de RF con conectores tipo N 30 cm.~~	2		

Wave Guide Switch for LNB	1		
LNB Banda C	1		
LNB Banda C	1		
~~Switch Netgear de 26 Puertos~~	~~1~~		
Cable USB	1		
~~Switch Netgear de 26 Puertos~~	~~1~~		
~~IBUC 40W~~	~~1~~		
~~IBUC 40W~~	~~1~~		
1+1 Interface	1		
Switch de Guia de Onda	1		
Cable Coaxial con conectores tipo N 30cm	2		
Cables de gestión con conector tipo Militar	2		
Cable de gestión tipo ethernet	1		
Cable de Energía	2		
Manuales de Curso de Rio de Janeiro			
Documentos Oficiales REDDIG II			
Manuales REDIG II			
Documentos Oficiales REDDIG II			
~~IBUC Terrasat 80 W~~	~~1~~		
~~IBUC Terrasat 80 W~~	~~1~~		
Tarjeta Serial MOXA de 8 Puertos RS-232 PCI	1		
Disco Duro Externo IOMEGA NAS 2 Tb	1		
Fuente para Disco Duro	1		
Manuales	1		
UPS Eaton Eclipse ECO 1200 VA	1		
Cable Multipuerto Moxa 8 puertos	1		
Cable Cisco V.24 DTE	5		
Cable Cisco V.24 DCE	11		
Cable DB25 Male-Female	6		
Cable Patch Cord ethernet RJ45	6		
Cable Multiple Cisco 8 puertos ethernet con adaptadores a DB25	2		
Two port Async-Sync Serial WAN interface card	1		
Four port Async-Sync Serial HWIC	1		

Four port Async-Sync Serial HWIC	1		
Eight port Async interface card	1		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Two Port Voice Interface Card FXS.~~	~~1~~		
~~Four Port Voice Interface Card FXS~~	~~1~~		
~~Four Port Voice Interface Card FXS~~	~~1~~		
~~Four Port Voice Interface Card FXS~~	~~1~~		
~~Four Port Voice Interface Card FXO~~	~~1~~		
One Port 2nd Gen Multiflex trunks Voice Wan Interface Card E1/T1	1		
High Density voice/fax external Module	1		
Two Port 2nd Gen Multiflex trunks Voice Wan Interface Card E1/T1	1		
Eight port Async-Sync interface card	1		
Module Adapter for SM Slot on CI	1		
Module Adapter for SM Slot on CI	1		
Impresora Laser Jet Pro 400 M401dn	1		
Cables de Energía	1		
8 Port Device Server 10/100 eth	1		
~~RSS 16 SLOT 4U Chasis~~	~~1~~		
Power Module	1		
Network Control Card	1		
Dual 8 wire Module Jack A/B card	1		
Dual 8 wire Module Jack A/B card	1		
D25 A/B Card	1		
D25 A/B Card	1		
D25 A/B Card	1		

D25 A/B Card	1		
~~RSS 16 SLOT 4U Chasis~~	~~1~~		
~~Power Module~~	~~1~~		
~~Network Control Card~~	~~1~~		
~~Dual 8 wire Module Jack A/B card~~	~~1~~		
~~Dual 8 wire Module Jack A/B card~~	~~1~~		
~~D25 A/B Card~~	~~1~~		
~~D25 A/B Card~~	~~1~~		
~~High density 8 port analog and digital extension module~~	~~1~~		
~~High density 8 port analog and digital extension module~~	~~1~~		
Cable de consola de Cisco	2		
KVM Extender	1		
Convertidor USB – Serial	1		
Telefono IP DEPAEPE	1		
Mouse Optico USB Negro	1		
Regleta electrica con 05 tomas	2		
Teclado Estandar K120	1		
Filtro RF	1		
Filtro RF	1		
Barras de Anclaje de acero	3		
Bloques de anclaje de plastico negro	6		
Tornillos de sujecion de acero	20		
Blank panel para RSS	3		
Regleta electrica con 05 tomas	2		
Adaptadores Cambia genero DB25	15		
Pantalla LCD 27"	1		
HP ProLiant DL160 Gen8 Base – Server	1		
~~NTP Time Server Master Clock~~	~~1~~		
GPS Antenna + Cable	1		
Router Cisco 2901	1		
Router Cisco 2901	1		
Router Cisco 2901	1		
~~IBUC Terrasat 80 W~~	~~1~~		

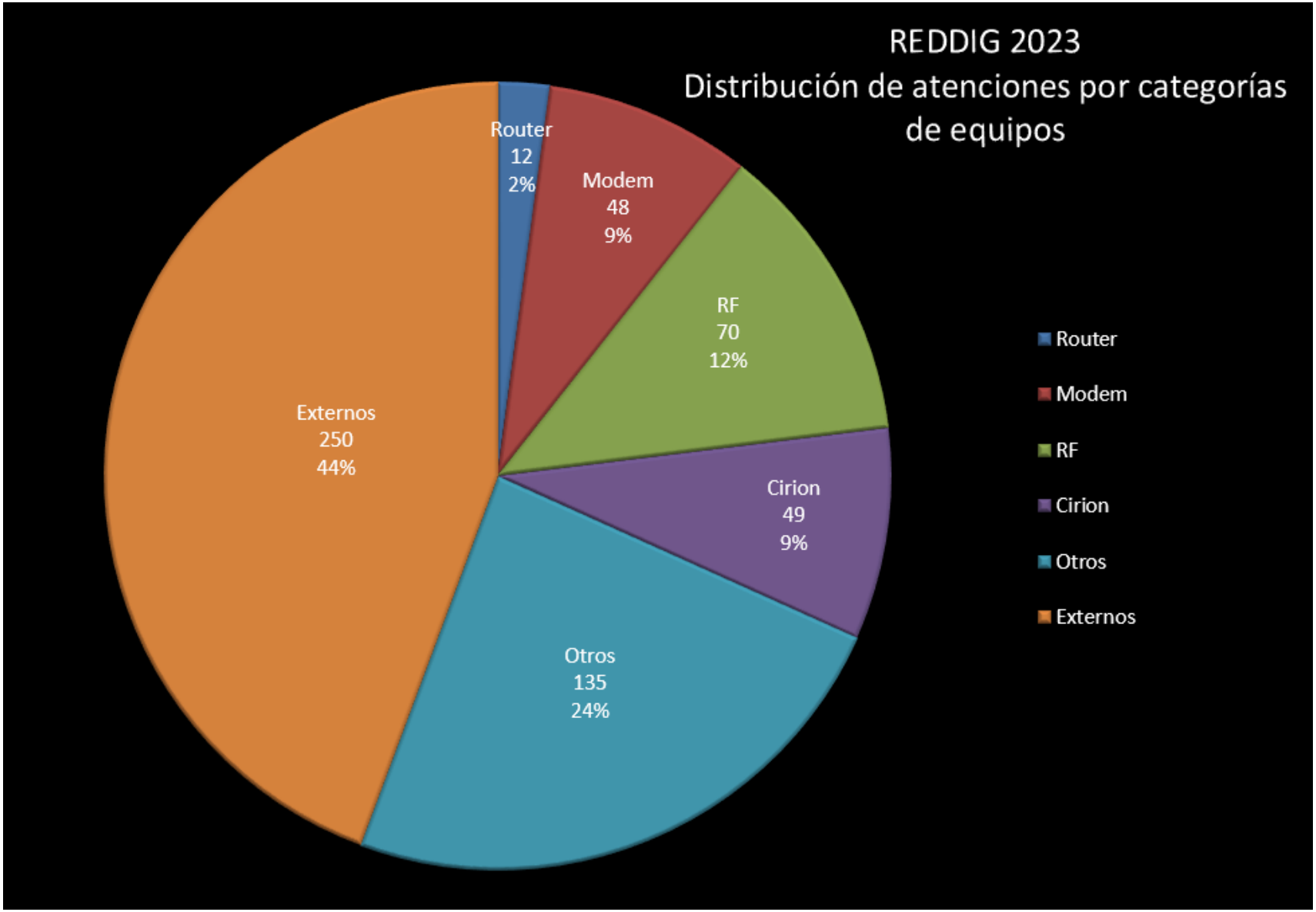
Firewall NETGEAR Prosafe VPN Dual Wan Gigabit	1		
~~VSAT Terminal IDU SkyWan 1070 19"~~	~~1~~		
Forti Gate S124EFTQ22002383	1		
Forti Gate S124EFTQ22002389	1		
Forti Gate S124EFTQ22002625	1		
Forti Gate S124EFTQ22002418	1		
REPUESTOS REDDIG I			
Fuente de Poder para CX950	1		
Fuente de Poder para CX950	1		
Fuente de Poder para CX950	1		
Fuente de Poder para CX950	1		
Fuente de Poder para CX950	1		
Fuente de Poder para CX950	1		
Fuente de Poder para CX950	1		
Fuente de Poder para CX950	1		
Dual Analog Voice Card	1		
Dual Analog Voice Card	1		
Dual Analog Voice Card	1		
Dual Analog Voice Card	1		
Dual Analog Voice Card	1		
Dual Analog Voice Card	1		
Dual Analog Voice Card	1		
Fast Ethernet 10/100 Card	1		
Fast Ethernet 10/100 Card	1		
Fast Ethernet 10/100 Card	1		
Fast Ethernet 10/100 Card	1		
Fast Ethernet 10/100 Card	1		
Fast Ethernet 10/100 Card	1		
Fast Ethernet 10/100 Card	1		
10 Base-T Ethernet Card	1		
10 Base-T Ethernet Card	1		
ISDN Card	1		
Digital Voice Processor	1		

Digital Voice Processor	1		
Digital Voice Processor	1		
Digital Voice Processor	1		
Digital Voice Processor	1		
Digital Voice Processor	1		
E1 Expansion	1		
V.35 H	1		
Multi I/O V.24	1		
Multi I/O V.24	1		
Multi I/O V.24	1		
Multi I/O V.24	1		
Multi I/O V.24	1		
Multi I/O V.24	1		
Modulo Ram 32 MB	1		
Modulo Ram 32 MB	1		
Modulo Ram 64 MB	1		
Modulo Ram 64 MB	1		
Modulo Ram 64 MB	1		
Modulo Ram 64 MB	1		
Slim Card E&M	1		
Slim Card E&M	1		
Slim Card E&M	1		
Slim Card E&M	1		
Slim Card E&M	1		
Slim Card E&M	1		
Slim Card E&M	1		
Slim Card E&M	1		
Slim Card E&M	1		
Universal I/O	1		
Universal I/O	1		
Universal I/O	1		
Universal I/O	1		
Universal I/O	1		

Universal I/O	1		
Ring Generator	1		
Ring Generator	1		
Ring Generator	1		
Ring Generator	1		
Ring Generator	1		
Ring Generator	1		
Chasis CX950	1		
Multiplexor CX950e Chasis+Placa Madre	1		
Multiplexor CX950e Chasis+Placa Madre	1		
Modem Linkway 2100	1		
Tarjeta MODEM	1		
Tarjeta Ethernet	1		
FR TIA	1		
Fax CANON H12130	1		
Telefono analogico CONAIRPHONE	1		
SSPA 40 W	1		
SSPA 40 W	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Fuente para Modem Linkway	1		
Rollo de cable ASSy 3 x 2.5 50 m	1		
Rollo de cable Multipar 50 m	1		
Rollo de cable Multipar 50 m	1		
LNB Banda C	1		

Cables Patch Cord Ethernet 3m	1		
Cables DB9-DB25 3m	1		
Rollo de Cable Coaxial 50R 50m	1		
SSPA 40 W	9		
GPS Datum	2		
Cable de consola Cisco	1		
Cable de Gestion SSPA Paradise	1		
Concectores Tipo N 50R sin ensamblar	1		
Pulsera anti estatica	1		
Paquete de Placas vacias para equipos Memotec.	1		
Combinador-Divisor de RF	4		
Convertidos RS232-RS485	1		
Paquete de instalacion SUN SOLARIS	1		
Tarjeta Multipuerto Serial	1		
Cable multipuerto DB25 para Multi I/O Memotec	1		
Cable Patch Cord Ethernet RJ45 5m	2		
Cable de consola Memotec	1		
Adaptador DB9-DB25	2		
Adaptador DB25-M34	2		
Cable de energía	1		
Cable RF Coaxial N-SMA Male	2		

APÉNDICE E / APPENDIX E
Atenciones / Attentions



APÉNDICE F / APPENDIX F

DISPONIBILIDAD DE CIRION DURANTE EL AÑO 2023 / AVAILABILITY CIRION DURING THE YEAR 2023

Cirion_Unavailability Credits_2023

		Jan-23		Feb-23		Mar-23		Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		Oct-23		Nov-23		Dec-23		TOTAL
		Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	USD Credit
1	SAEZ																									0.00
2	SBBR																									0.00
3	SBCT																	97.35%	16.57							16.57
4	SBMN							95.35%	32.42			99.33%	2.75							99.53%	1.22	96.21%	25.96			62.35
5	SBRF	95.12%	32.29	98.23%	10.39	96.91%	19.67					99.63%	0.51	99.19%	3.57	99.48%	1.54	99.33%	2.58	99.06%	4.5	98.56%	8.01	98.90%	5.58	88.64
6	SCEL																									0.00
7	SEGU																									0.00
8	SGAS									97.30%	40.08	98.23%	24.57													64.65
9	SKED					99.58%	0.11													99.49%	1.43	99.48%	1.57	99.44%	1.8	4.91
10	SLLP									95.97%	88.03	98.47%	29.05													117.08
11	SMPM											98.66%	36.4	98.62%	37.77			98.47%	29.1							103.27
12	SOCA													97.58%	50.14	99.69%	0.28	95.00%	111.20							161.62
13	SPIM																	99.67%	0.2							0.20
14	SUMU																									0.00
15	SVMI									94.41%	134.84	92.75%	177.23													312.07
16	SYGC											99.53%	7.11					99.12%	24.29	98.71%	41.47			99.58%	5.14	78.01
17	TTZP					97.33%	18.82			99.39%	2.49			97.61%	16.62	99.39%	2.46									40.39
18	ARSAT															99.04%	9.02									9.02
19	SBRJ																									0.00
20	SLCB							96.75%	59.55									97.22%	50.02							109.57
21	FAOR									98.59%	8.36	0.00%	750			88.80%	81.78	98.65%	7.91	98.77%	6.97					855.02
22	MPTO																									0.00
23	LEEE											94.56%	38.55													38.55
24	MSLP																									0.00
25	ICAO																									0.00
			32.29		10.39		38.6		91.97		273.8		1066.17		108.1		95.08		241.87		55.59		35.54		12.52	
															2061.92											

Note: SLA-Availability for all nodes: 99.70%

USD 2061.92

ORGANIZACIÓN DE AVIACIÓN CIVIL INTERNACIONAL
Programa de Cooperación Técnica

Proyecto RLA/03/901
Sistema de Gestión de la REDDIG y Administración del Segmento Satelital

INFORME DE MISIÓN

del
Ing. Cristian Javier Vittor, Administrador de la REDDIG

RLA03901 – Oficina Regional OACI, Lima (Perú)

Bogotá, Colombia, 28 de enero de 2023 al 06 de febrero de 2023

Parte 1. GENERAL

1.1 Itinerario

Salida Manaos – Panamá: 28 de enero de 2023(hora: 03:53hs – 06:38hs)
Panamá – Bogotá: 21 de noviembre de 2023 (hora: 07:50hs - 09:30hs)

Regreso Bogotá – Panamá: 05 de febrero de 2023 (hora: 15:23hs – 17:20hs)
Panamá - Manaos: 06 de febrero de 2023 (21:50hs – 02:48hs)

1.2 Autoridades y funcionarios contactados

Ing. Andrés Colmenares
Ing. Robinson Quinteros

1.3 Objetivos de la misión

- Dar cumplimiento a lo establecido durante la Vigésima Octava Reunión del Comité de Coordinación de la REDDIG (RCC/28), en particular, del Informe Final, lo expresado en "Visitas a los nodos REDDIG II", párrafo 4.24, mudanza del nodo Bogotá.

- Supervisar y acompañar los trabajos que realizó representante de la empresa Engie contratada para la mudanza del nodo Bogotá.

Parte 2. ACTIVIDADES DESARROLLADAS

2.1 A partir del arribo a la sede del nodo Bogotá, y la presentación ante las autoridades, se procedió con el inicio de las actividades.

2.2 Las actividades realizadas, específicas, fueron supervisar, acompañar y participar del traslado del equipamiento del nodo Bogotá desde sus instalaciones en la sala técnica del CNA (Centro Nacional de Aeronavegación) a las nuevas instalaciones del data center en el CGAC (Centro de Gestión Aeronáutico de Colombia).

2.3 Se debe dejar en claro que las actividades, de la mudanza del nodo, estuvieron a cargo de la empresa Engie contratada por la Administración de Colombia a través del Proyecto Regional. Estas tareas fueron coordinadas en diversas reuniones, tanto presenciales como virtuales con las partes intervinientes, y de acuerdo a contrato vigente (Amendment IX to Contract 22501200)

2.4 ***Traslado del equipamiento contenido en el rack***

2.4.1 Durante la misión se trasladaron los equipos pertenecientes a la cadena A desde el CNA hasta el CGAC, se hicieron las instalaciones de los accesorios y los mismos en la nueva ubicación.

2.4.2 El trabajo para realizar estas tareas fueron muy arduas debido a las condiciones, tanto de los cuidados para minimizar el impacto operacional, como los desafíos planteados en la antigua y nueva ubicación.

2.4.3 Por cuestiones operacionales, la cadena B no fue mudada y la misma no se concretó hasta que el acceso por la red satelital no fue habilitado, lo cual dependió exclusivamente del trabajo del contratista.

2.4.4 Al momento de finalizar la misión, se concretó la mudanza de todos los equipos aunque

algunos detalles a resolver.

2.5 ***Instalación de la nueva antena, obras, y puesta en servicio***

2.5.1 Al llegar al lugar se pudieron apreciar las obras civiles terminadas, la antena instalada en cuanto a su infraestructura.

2.5.2 Se observa que la distancia entre el rack y la antena es de 80 mts, y que se tuvieron que añadir tramos de cable a los cables de Tx y Rx, lo que se tradujo en inconvenientes.

2.5.3 Gracias a los esfuerzos por parte del personal de Engie, con el apoyo de los demás participantes, se consiguió sincronizar la estación.

2.5.4 Se presentaron muchísimas dificultades relacionadas con la nueva antena según lo observado.

2.6 ***Registro fotográfico***

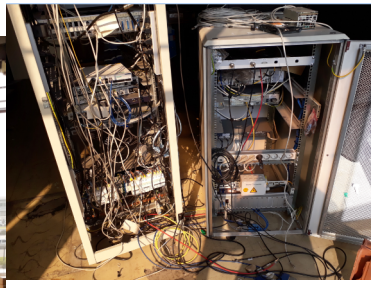
2.6.1 A efectos de poder dar una idea más concreta de lo expresado en el informe, a continuación, se pueden apreciar diferentes fotografías que ilustran los trabajos realizados.

Antena antigua

rack con los equipos en instalación del CNA



Racks en instalaciones del CNA y equipos sobre los cuales se hicieron mantenimientos

racks con equipos de REDDIG y MEVA



Trabajso en antena nueva

Rack nuevo

2.3 Se destaca la colaboración del Staff de la Administración de Colombia como así también la excelente predisposición y soporte en todo momento. Demostrando compromiso, responsabilidad, y gran profesionalismo.

Ing. Cristian Javier Vittor
REDDIG Administrator

APÉNDICE H/ APPÉNDIX H
Distribución equipos Fortinet / Fortinet equipment distribution

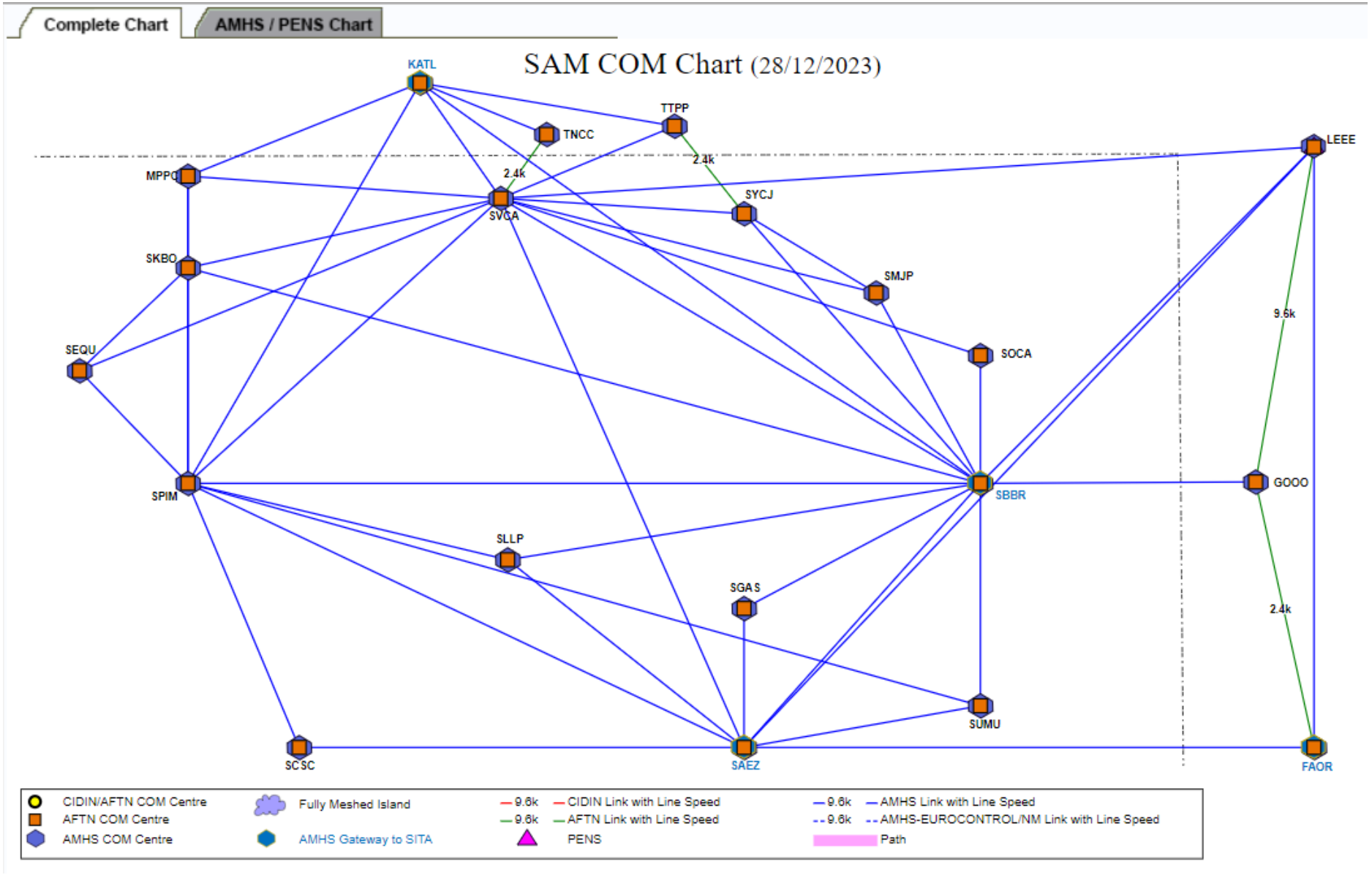
					Fortigate A Lumen		Fortigate B Estado		FortiSwitch		FortiAnalizer		FortiManager		Mask	Gateway
				XX	IP	10.100.xx.130	Nro. Serie	10.100.xx.131	Nro. Serie	10.100.xx.140	Nro. Serie	10.100.xx.150	Nro. Serie	10.100.xx.160		255.255.255.0	10.100.xx.254
	País	Localidad	Station	Code													
1	Brasil	Manaus	SBMN	36		SBMN-FORTI-FG-A	FGT61FTK21012948	SBMN-FORTI-FG-B	FGT61FTK21013420	SBMN-FORTI-FS-A	S124EFTQ22002370	SBMN-FORTI-FAN	FAZ3HGTA220007	SBMN-FORTI-FMG	FMG2HGTA22000266		
2	Argentin	Ezeiza	SAEZ	20		SAEZ-FORTI-FG-A	FGT61FTK21012486	SAEZ-FORTI-FG-B	FGT61FTK21012851	SAEZ-FORTI-FS-A	S124EFTQ22002376						
3	Brasil	Curitiba	SBCT	30		SBCT-FORTI-FG-A	FGT61FTK21012472	SBCT-FORTI-FG-B	FGT61FTK21012919	SBCT-FORTI-FS-A	S124EFTQ22002427						
4	Chile	Santiago	SCEL	40		SCEL-FORTI-FG-A	FGT61FTK21012479	SCEL-FORTI-FG-B	FGT61FTK21012609	SCEL-FORTI-FS-A	S124EFTQ22002458						
5	Uruguay	Montevideo	SUMU	65		SUMU-FORTI-FG-A	FGT61FTK21014558	SUMU-FORTI-FG-B	FGT61FTK21012992	SUMU-FORTI-FS-A	S124EFTQ22002464						
6	Bolivia	La Paz	SLLP	25		SLLP-FORTI-FG-A	FGT61FTK21014533	SLLP-FORTI-FG-B	FGT61FTK21014448	SLLP-FORTI-FS-A	S124EFTQ22002630						
7	Colombi	Bogotá	SKED	45		SKED-FORTI-FG-A	FGT61FTK21014399	SKED-FORTI-FG-B	FGT61FTK21014768	SKED-FORTI-FS-A	S124EFTQ22002617						
8	Ecuador	Guayaquil	SEGU	50		SEGU-FORTI-FG-A	FGT61FTK21012420	SEGU-FORTI-FG-B	FGT61FTK21011243	SEGU-FORTI-FS-A	S124EFTQ22002619						
9	Paragua	Asunción	SGAS	55		SGAS-FORTI-FG-A	FGT61FTK21013141	SGAS-FORTI-FG-B	FGT61FTK21014824	SGAS-FORTI-FS-A	S124EFTQ22002377						
10	Perú	Lima	SPIM	60		SPIM-FORTI-FG-A	FGT61FTK21014241	SPIM-FORTI-FG-B	FGT61FTK21013222	SPIM-FORTI-FS-A	S124EFTQ22002629						
11	Brasil	Recife	SBRF	38		SBRF-FORTI-FG-A	FGT61FTK21012961	SBRF-FORTI-FG-B	FGT61FTK21014260	SBRF-FORTI-FS-A	S124EFTQ22002635						
12	Guyana	Cayena	SOCA	92		SOCA-FORTI-FG-A	FGT61FTK21014551	SOCA-FORTI-FG-B	FGT61FTK21012456	SOCA-FORTI-FS-A	S124EFTQ22002413						
13	Guyana	Georgetown	SYGC	90		SYGC-FORTI-FG-A	FGT61FTK21015068	SYGC-FORTI-FG-B	FGT61FTK21014782	SYGC-FORTI-FS-A	S124EFTQ22002415						
14	Surinam	Paramaribo	SMPM	94		SMPM-FORTI-FG-A	FGT61FTK21013226	SMPM-FORTI-FG-B	FGT61FTK21012911	SMPM-FORTI-FS-A	S124EFTQ22002419						
15	Trinida&	Piarco	TTZP	91		TTZP-FORTI-FG-A	FGT61FTK21014583	TTZP-FORTI-FG-B	FGT61FTK21014901	TTZP-FORTI-FS-A	S124EFTQ22002420						
16	Venezue	Maiquetia	SVMI	80		SVMI-FORTI-FG-A	FGT61FTK21013041	SVMI-FORTI-FG-B	FGT61FTK21010597	SVMI-FORTI-FS-A	S124EFTQ22002840						
17	Brasil	Brasilia	SBBR	34		SBBR-FORTI-FG-A	FGT61FTK21014571	SBBR-FORTI-FG-B	FGT61FTK21013443	SBBR-FORTI-FS-A	S124EFTQ22002371						
18	Panamá	Panamá	MPTO	88		MPTO-FORTI-FG-A	FGT61FTK21014935	MPTO-FORTI-FG-B	FGT61FTK21014515	MPTO-FORTI-FS-A	S124EFTQ22002381						
19	OACI	Lima	OACI	63		OACI-FORTI-FG-A	FGT61FTK21013176										
20	Brasil	Río de Janei	SBRJ	32		SBRJ-FORTI-FG-A	FGT61FTK21013002										
21	Argentin	ARSAT	ARST	22		ARST-FORTI-FG-A	FGT61FTK21013385										
22	Bolivia	Cochabamb	SLCB	27		SLCB-FORTI-FG-A	FGT61FTK21012861										

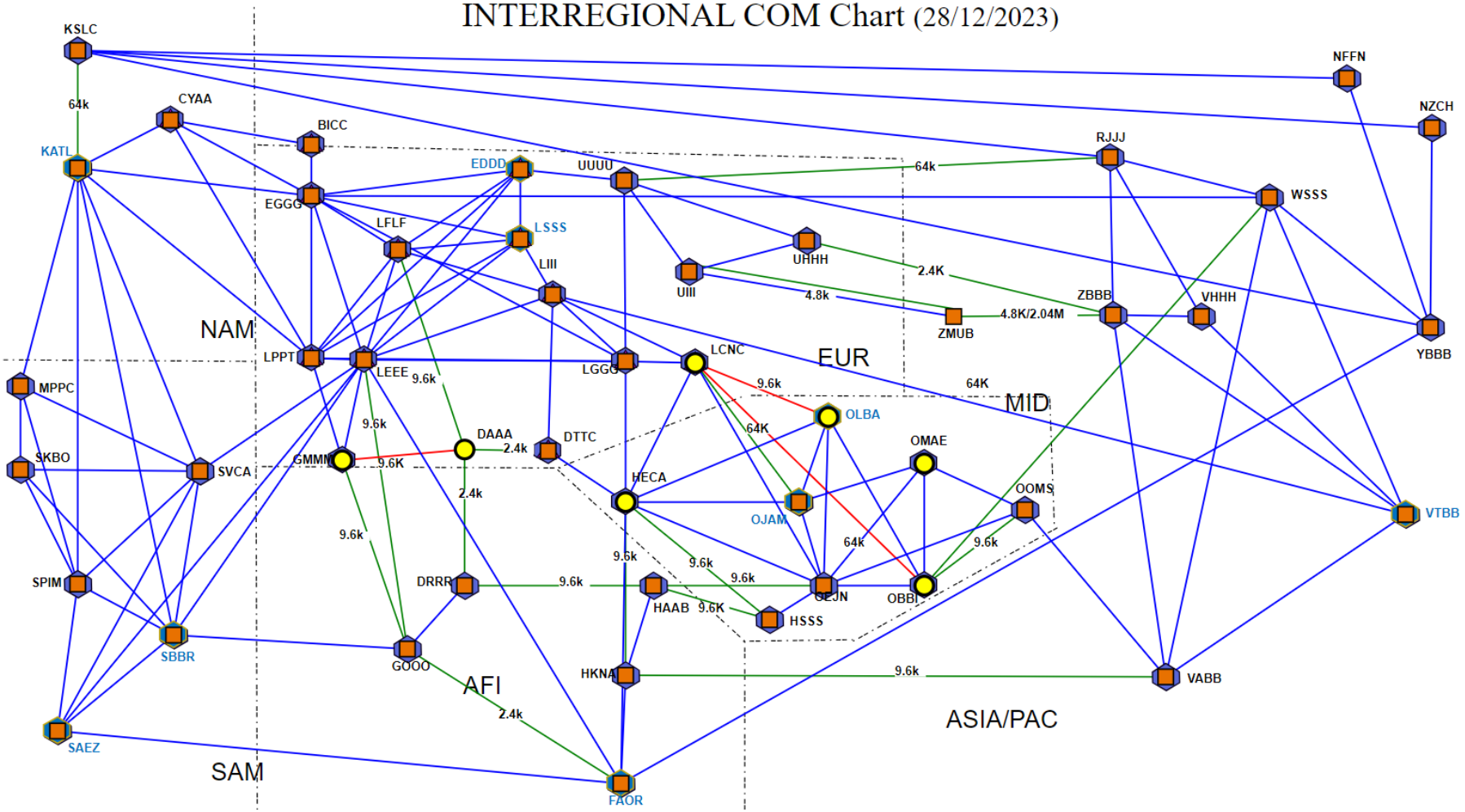
S124EFTQ22002383	Spare
S124EFTQ22002389	
S124EFTQ22002418	
S124EFTQ22002625	

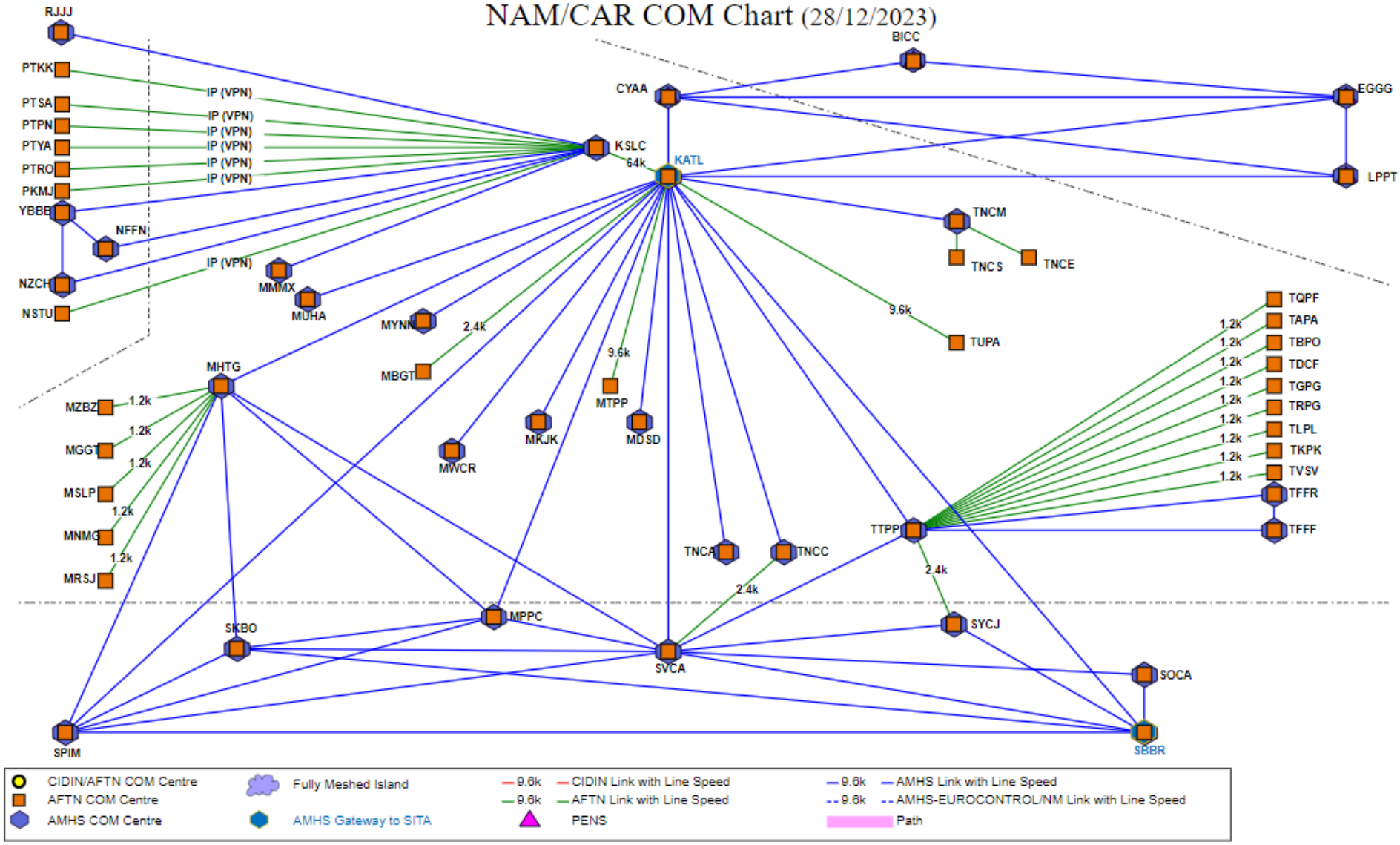
APÉNDICE I / APPENDIX I

INTERCONEXIONES IMPLEMENTADAS / IMPLEMENTED INTERCONNECTIONS

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
INTER. AMHS OPER.	SKBO – SPIM 08/11/2010		SEQU – SPIM 26/07/2012			SBBR – SPIM 14/12/2015		SBBR – SKBO 22/05/2017	SAEZ – SBBR 04/04/2018	SLLP-SPIM 10/05/2019	SEQU-SKED 16/01/2020	SVMI-KATL 26/01/2021	SPIM-SUMU 25/11/2022	LEE-FAOR 04/07/2023
			SAEZ – SGAS /2012			SCSC – SPIM 14/12/2015		SBBR – SYCJ 16/07/2017	SAEZ – SGAS 30/11/2018	SBBR-KATL 06/08/2019	SVMI-SOCA 22/01/2020		SAEZ-SUMU 29/11/2022	COCESNA-FAA 13/06/2023
								SKBO – SVMI 01/12/2017	SBBR – SGAS 30/11/2018	SVMI-SYCJ 27/08/2019	SBBR-SOCA 22/01/2020		COCESNA 12/10/2022	MPPC – SVMI 22/06/2023
								SPIM – SVMI 01/12/2017	SBBR – SMJP 11/10/2018	SLLP-SBBR 30/07/2019	SAEZ-SCEL 21/01/2020		SVMI-SAEZ 06/06/2022	SAEZ-FAOR 01/06/2023
									SBBR – SVMI 28/02/2018	SAEZ-SPIM 10/05/2019	MPPC-SKED 30/07/2020		SUMU-SBBR 07/02/223	SPIM-MPPC 04/04/2023
									SEQU – SVMI 11/10/2018	SAEZ-SITA 18/07/2019	SPIM-KATL 02/03/2020		COCESNA 14/09/2022	SAEZ-LEE 08/03/2023
									SMJP – SYCJ 11/10/2018	SVMI-SMJP 21/03/2019			SKED-COCESNA	SBBR-LEE 28/02/2023
									SBBR - SITA 16/08/2018	~~SBBR-LETO /05/2019~~				SVMI-LEE 14/02/2023
									SBBR-LETO 11/10/2018	SAEZ-SLLP				AIREON-COCESNA 20/04/2023 ADS-B
	1		2			2		4	9	8	6	1	7	9


Complete Chart
AMHS / PENS Chart
SAM COM Chart (28/12/2023)
KATL
TTPP
TNCC
LEEE
2.4k
2.4k
MPPC
SVCA
SYCJ
SKBO
SMJP
9.6k
SEQU
SOCA
SPIM
SBBR
GOOO
SLLP
SGAS
2.4k
SUMU
SCSC
SAEZ
FAOR
CIDIN/AFTN COM Centre
AFTN COM Centre
AMHS COM Centre
Fully Meshed Island
AMHS Gateway to SITA
9.6k CIDIN Link with Line Speed
9.6k AFTN Link with Line Speed
PENS
9.6k AMHS Link with Line Speed
9.6k AMHS-EUROCONTROL/NM Link with Line Speed
Path


INTERREGIONAL COM Chart (28/12/2023)
KSLC
NFFN
NZCH
64k
CYAA
BICC
KATL
EDDD
UUUU
64k
RJJJ
EGGG
WSSS
LFLF
LSSS
LIII
UHHH
2.4K
UIII
4.8k
ZBBB
VHHH
4.8K/2.04M
ZMUB
YBBB
NAM
LPPT
LEEE
9.6k
LGGG
LCNC
EUR
MPPC
9.6k
64K
MID
OLBA
9.6k
DAAA
2.4k
DTTC
64K
OMAE
SKBO
SVCA
GMMM
9.6K
HECA
OOMS
2.4k
OJAM
VTBB
9.6k
64k
9.6k
SPIM
DRRR
9.6k
9.6k
9.6k
HAAB
9.6K
GEJN
OBBI
HSSS
SBBR
GOOO
AFI
HKNA
9.6k
VABB
2.4k
ASIA/PAC
SAEZ
SAM
FAOR


NAM/CAR COM Chart (28/12/2023)
RJJJ
PTKK
PTSA
PTPN
PTYA
PTRO
PKMJ
YBBB
NFFN
NZCH
NSTU
IP (VPN)
KSLC
64k
KATL
BICC
CYAA
EGGG
LPPT
TNCM
TNCS
TNCE
TUPA
9.6k
MMMX
MUHA
MYNN
MBGT
2.4k
MHTG
MZBZ
MGGT
MSLP
MNMG
MRSJ
1.2k
MWCR
MKJK
MTPP
MDSD
TQPF
TAPA
TBPO
TDCF
TGPG
TRPG
TLPL
TKPK
TVSV
TFFR
TFFF
TTPP
TNCA
TNCC
SKBO
MPPC
SVCA
SYCJ
SOCA
SPIM
SBBR
CIDIN/AFTN COM Centre
AFTN COM Centre
AMHS COM Centre
Fully Meshed Island
AMHS Gateway to SITA
9.6k CIDIN Link with Line Speed
9.6k AFTN Link with Line Speed
PENS
9.6k AMHS Link with Line Speed
9.6k AMHS-EUROCONTROL/NM Link with Line Speed
Path