



**International Civil Aviation Organization**  
**South American Regional Office - Regional Project RLA/03/901**  
*REDDIG Management System and Satellite Segment Administration*  
**Nineteenth Meeting of the Coordination Committee (RCC/19)**  
Lima, Peru, 7 to 9 March 2016

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

(Presented by the Secretariat)

<b>SUMMARY</b>	
This paper presents information on the progress made in the implementation of the activities agreed upon at the last meeting of the Coordination Committee (RCC/18) and to be included in the 2015 work plan.	
<b>Reference</b>	
<ul style="list-style-type: none"><li>• REDDIG Contract 22501200;</li><li>• Report of the Eighteenth Meeting of the REDDIG Coordination Committee (RCC/18) (Lima, Peru, 2-4 March 2015);</li><li>• Report of the first MEVA III / REDDIG II coordination meeting (Oranjestad, Aruba, 23-26 May 2015); e</li><li>• Reports of teleconferences conducted (11 December 2015 and 25 January 2016).</li></ul>	
<b>ICAO Strategic Objectives:</b>	<i>A - Safety</i> <i>B – Air navigation capacity and efficiency</i>

**1. Background**

1.1 The main activities agreed upon at the last meeting of the Coordination Committee (RCC/18) to be included in the 2015 work plan and additional to those pertaining the operation, support and maintenance of the network, were the following:

- a) REDDIG II training programme;
- b) REDDIG II operation and analysis to the implementation of new services; and
- c) Installation and operation of the MEVA III / REDDIG II interconnection.

1.2 Likewise, this working paper presents REDDIG logistics aspects since RCC/18, to date.

**2. Analysis**

***REDDIG II TRAINING PROGRAMME***

2.1 With regard to training activities, the following courses were carried out:

- a) Specialized course on the management software “WhatsUp Gold”; and
- b) Basic course on CISCO routers and IP switch.

***Specialized course on the management software “WhatsUp Gold”***

2.2 RCC/18 meeting took under consideration the need to conduct an advanced course on WhatsUp Gold, the software application used for the monitoring and management of the equipment composed by REDDIG II, as a result of the recommendation formulated by the participants at the REDDIG II course on factory, who informed that the training received there on WhatsUp Gold was basic and they required an advanced course.

2.3 In this sense, RCC/18 approved the holding of a specialized course on the WhatsUp Gold management software, which took place in Manaus, Brazil, from 21 to 24 April 2015, at the facilities of the Cuarto Centro Integrado de Defensa Aérea y Control del Tránsito Aéreo – CINDACTA IV.

2.4 The course was dictated by Mr. Camilo Luis Zamai, Corporative Technical Support, Mentat Soluções Ltda., SP, Brazil. Eight member States assisted (Argentina, Brazil, Chile, Ecuador, Paraguay, Peru, Trinidad & Tobago and Uruguay) with a total of 21 participants.

2.5 The course’s programme is shown in **Appendix A** to this working paper. The course material has been uploaded at the REDDIG II website, [www.lima1.icao.int/reddig](http://www.lima1.icao.int/reddig). The cost of the course was of USD 4,767.00, without including neither simultaneous interpretation services, nor the fellowships granted to the participants.

***Basic course on CISCO IP routers and switches***

2.6 RCC/18 meeting, as a result of the REDDIG II training courses carried out in 2014, deemed it convenient to hold a basic course on CISCO IP routers and switches for the staff in charge of REDDIG II maintenance and operation, as there was a great number of technicians without a solid knowledge on IP networks and their associated equipment (CISCO routers and switches).

2.7 In this sense, RCC/18 approved the implementation of a basic course on CISCO IP routers and switches, whose description contents are presented in **Appendix B** to this working paper. The objective of the course was to provide the skills and knowledge required for installing, operating and resolving connectivity issues of REDDIG II, including the configuration of switches, routers, and the respective safety implementation.

2.8 The complete basic course consists of two independent parts, and in view of the cost and duration involved, the idea was to conduct the course in two segments: A first segment entitled “*Interconnecting Cisco Network Devices Part 1 (ICND1)*”, conducted on 9-13 November 2015, and a second segment entitled “*Interconnecting Cisco Network Devices Part 2 (ICND2)*”, scheduled for 4-8 April 2016.

2.9 The cost of the course ICDN1 was of USD 8,000.00 (eight thousand US dollars). This amount does not include simultaneous interpretation services, or participants’ fellowships.

2.10 Ten REDDIG II member States (Argentina, Brazil, Chile, Ecuador, Colombia, Paraguay, Peru, Suriname, Trinidad & Tobago and Uruguay) participated in the course ICDN1, totalling 16 participants. The content of this course was uploaded at the REDDIG website, [www.lima1.icao.int/reddig](http://www.lima1.icao.int/reddig).

## **REDDIG II OPERATION AND ANALYSIS TO THE IMPLEMENTATION OF NEW SERVICES**

### *Satellite network performance*

2.11 REDDIG II presented initial operational problems at some of its services, such as the AFTN, AMHS, some ATS speech and administrative circuits, the IP telephone network for the ATFM service, the node management service (NMS), and the freezing of some satellite modems.

2.12 With time, most of the failures were solved, achieving to date a stable performance, with high availability. The network still presents some problems, such as random freezing at some of the satellite modems (Skywan).

2.13 With respect to this failure, INEO reported that according to NDSatCom investigation, there is 90% probability that it is due to a synchronization problem between the RX RF part and the Skywan modems.

2.14 To fix the problem, NDSatCom requires replacing all existing LBNs (which presently generate internally their own 10MHz intermediate frequency) by new LNBs (receiving an external 10MHz intermediate frequency coming from the Skywan).

2.15 Additionally, NDSatCom also recommends adding an RF filter in the LNB path to avoid perturbations that could come from external sources, such as radar and/or aircraft transponders at each airport or mobile communications (WIMAX). Such filter may not be required everywhere, and a specific analysis per site may be necessary.

2.16 For the implementation of the solution, INEO will apply the following actions without any cost to REDDIG II member States:

#### Phase 1

- a) The replacement of the two LNBs and the adding of the RF filter on four sites (Manaus, Recife, Ezeiza, Lima).
- b) The replacement of the items will be done firstly at Manaus to make sure that the modifications will not generate any other hardware problem.
- c) Then, the replacement of the items will be done on the three other sites.
- d) Once the four sites are modified, a new analysis of the system will be done by NDSatCom to see if a significant reduction of the TDMA CRC errors can be noticed. (\*)

*\* The modifications to be done on the four sites is only the first step observation. The complete reduction in the TDMA CRC errors can only be observed once all sites are modified.*

#### Phase 2

- a) If there is a significant reduction of the TDMA CRC errors, the same hardware modifications will be deployed on all the sites.
- b) Then, the whole network will be under observation during some weeks, to see if the problem is solved definitely.
- c) If not, NDSatcom will have to investigate more deeply, by going on some important sites (e.g. Manaus and/or others sites to be defined).

2.17 INEO informed that the hardware modifications to be done everywhere should not exceed one or two days per site. An INEO technician will be in charge of these interventions.

2.18 INEO has already purchased the new model of LNBS and filters for the first phase, and replaced the LNB at the Manaus node on 11 January 2016. It is expected that the replacement of the LNBS and installation of the RF filters at the remaining nodes happen by mid-March 2016. **Appendix C** to this working paper includes the LNB replacement procedure and RF filter installation, as well as both their technical characteristics.

2.19 Once the solution is implemented and in the event no more freezings present themselves at the satellite modems for a continuous one-month period and the TDMA CRC errors significantly reduce, will the final satellite network acceptance take place.

2.20 **Appendix D** to this working paper presents an Excel table with the status of all REDDIG II pending items since the REDDIG II Provisional Acceptance Test (January 2015), plus other failures occurred after the PSAT.

2.21 From the latest events occurred in REDDIG II that are pending solution is the change in the synchronization reference from the Manaus NCC to the Ezeiza NCC without the intervention of the REDDIG II Administrator, and the low RF reception levels at Ezeiza, Montevideo and Guayaquil.

#### *Activities pertaining to the implementation of the new Brasilia node*

2.22 For the implementation of the Brasilia node, REDDIG II Contract 22501200 had an addition, Amendment III. This amendment was signed on 3 August 2015 among INEO, LEVEL 3 and the ICAO Technical Cooperation Bureau representatives. Copy of Amendment III to the Contract is shown in **Appendix E** to this working paper.

2.23 The new node of Brasilia, like all REDDIG II nodes, has four parts, with two redundant channels to ensure high availability in the network. The first part consists of outdoor equipment: a new antenna of 3.8m in diameter, the LNB receiver elements, and the SSPA for transmission (40-watt amplifier). The second and most important part of the node includes the CISCO 2901 routers that serve as interface with the services, and the satellite modems (SKYWAN 1070) to transmit and receive satellite information. The other two parts comprise the monitoring system and the VPN router for external connection.

2.24 The equipment to access the LEVEL 3 ground fibre optic network consists of two 2901 routers that take over in case of failure of the satellite network. As in the other REDDIG nodes, the bandwidth to access the ground network is 256Kbits/sec.

2.25 The services at the Brasilia node are as follows: an AFTN circuit with Guyana, 11 AMHS circuits (all States adjacent to Brazil and the circuit with Atlanta through the MEVA III REDDIG II interconnection). Regarding speech circuits, there are three administrative switched circuits and four ATS switched speech circuits. **Appendix F** to this working paper shows the detailed setup of services at the Brasilia node.

2.26 The Works for the installation of the new REDDIG node in Brasilia started in January 2016, and was completed on 3 February 2016.

2.27 Satisfactory factory tests were conducted on 20 November 2015, proceeding with its acceptance and signature. The trials were carried out by a representative from Brazil and the REDDIG II project technical manager. The documents pertaining to the Brasilia node PSAT are found in the REDDIG II website, [www.lima1.icao.int/reddig](http://www.lima1.icao.int/reddig).

### ***Data link services through REDDIG II***

2.28 In follow-up to Conclusion RCC 18/2 - *Tests to access the SITA data link service through the REDDIG II by ANSP*, the data link service is passing through REDDIG II since 8 October 2015, further details are found in another working paper of this Meeting.

### ***Ground network performance (LEVEL 3)***

2.29 The ground network services (LEVEL 3) were tested and accepted at the beginning of July 2015 by all REDDIG II focal points. Since the satellite network still had unresolved matters, as explained in the section pertaining to the performance of the satellite network in this working paper, the final ground network acceptance could not be effected, as the REDDIG II final acceptance is to be signed as a whole.

2.30 Taking into consideration that if the final acceptance of the ground services had not been agreed with the provider, LEVEL 3 would have suspended its services, and considering that the delays in the implementation of the aspects pending in the satellite network had nothing to do with the ground network services, all REDDIG members decided to conduct two final acceptance tests, one with LEVEL 3 and the other, with INEO.

2.31 In this sense, the ICAO Technical Cooperation Bureau made an amendment to the REDDIG II contract (Amendment IV to contract 22501200) in order that the changes indicated in the aforementioned paragraph, appear. Copy of Amendment IV and of the final ground network acceptance certificate are shown in **Appendix G** to this working paper.

2.32 Therefore, at the end of December 2015 the six-month services established in the Contract were completed, and a new four-and-a-half period of direct service with LEVEL 3 started in January 2016, as indicated in the REDDIG II contract.

### ***INSTALLATION AND OPERATION OF THE MEVA III / REDDIG II INTERCONNECTION***

2.33 The first MEVA III-REDDIG II coordination meeting was held in Oranjestad, Aruba, 25 to 26 May 2015, in order to coordinate the final activities required for the implementation of aspects still pending for the interconnection of the new MEVA III and REDDIG II networks, the implementation of new services in the interconnection, and the review of the Memorandum of Understanding (MoU) that provides for technical, operational, and administrative coordination between the MEVA III and REDDIG II networks.

2.34 The coordination meeting was attended by 29 delegates of 9 CAR and SAM States/Territories, one international organisation (COCESNA), the MEVA III service provider, and the REDDIG II Administrator. The main results of the meeting are listed below:

- a) Establishment of the steps to be taken to complete the implementation of the data (AFTN) and switched speech circuits foreseen for the MEVA III – REDDIG II interconnection.
- b) Establishment of the action to be taken to complete the implementation of hot lines in Bogota and Caracas, and AFTN circuits with Atlanta from Bogota and Caracas.
- c) An analysis of the implementation of new circuits in the MEVA III – REDDIG II interconnection during the 2015-2017 period. The circuits considered were the following:

No.	Circuits required	Estimated implementation date
1	Radar data exchange between Curacao and Venezuela	Before 2017
2	Radar data exchange between Colombia and Panama	Mid-2016
3	Implementation of SAM AMHS circuits with Atlanta <ul style="list-style-type: none"> <li>• Caracas - Atlanta</li> <li>• Brasilia - Atlanta</li> <li>• Lima - Atlanta</li> </ul>	2016-2017
4	Bogota – Panama AMHS circuit	2016
5	Implementation of Atlanta- PIARCO AMHS circuit through the REDDIG II COCESNA node	2016
6	PIARCO- Curacao AFTN circuit	After 15 June 2015

2.35 In this regard, the meeting formulated Conclusion MIII/RII 1/2 - *Confirmation of new interconnection circuit requirements*, requesting the States concerned to confirm the implementation of the circuits listed in the table under paragraph 2.3, so as to coordinate as needed for their implementation.

2.36 Finally, through conclusion MIII/RII 1/3, the meeting reviewed and approved the MoU between MEVAIII and REDDIGII member States/Territories/International Organisations concerning coordination and cooperation for the MEVA III – REDDIG II interconnection, which is presented as **Appendix H** to this working paper.

### **REDDIG LOGISTICS ASPECTS**

2.37 The logistical operations, mainly originated by failures in the node, include the remittance of equipment or spare parts from the REDDIG storage site, located in the ICAO SAM Regional Office in Lima, or from any other node, to the node requiring them, including coordination with the factories for the repair of the equipment, payment for any transportation and costs involved, as well as coordination and support to States for any import and export involved.

2.38 Since RCC/18, five (5) logistical operations were carried out. The summary of equipment failures and spare parts is shown in **Appendix I** to this working paper.

2.39 **Appendix J** shows the statistics pertaining to the amount of attentions provided to the network node, as well as their distribution as regards the type of equipment originating the attention.

2.40 **Appendix K** presents the network availability chart since 2004, up to the end of 2015. In it, observation can be made that there has been a decrease in availability due to the start-up of the REDDIG II network, and its initial problems.

### **3. Suggested action**

3.1 The Coordination Committee is invited to:

- a) Take note of the information provided;
- b) Review the activities undertaken since RCC/18 described in Section 2, and Appendices A to K of this working paper; and
- c) Analyse any other aspect deemed necessary regarding this Agenda Item.

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APPENDIX A / APENDICE A

Programa: Curso especializado sobre el software de gestión “WhatsUp Gold

<b>Parte 1 – Introducción .....</b>	
<b>Que es Whats Up Gold? Cuáles son sus beneficios .....</b>	
<b>Cuáles son las versiones del producto .....</b>	
<i>WhatsUp Gold PREMIUM EDITION .....</i>	
<i>WhatsUp Gold DISTRIBUTED EDITION.....</i>	
<i>WhatsUp Gold MSP EDITION.....</i>	
<b>Cuáles son los Plug-ins (opcionales) .....</b>	
<i>WhatsUp Gold Flow Monitor .....</i>	
<i>WhatsUp Gold Flow Publisher.....</i>	
<i>WhatsUp Gold WhatsConfigured .....</i>	
<i>WhatsUp Gold VoIP Monitor .....</i>	
<i>WhatsUp Gold WhatsVirtual .....</i>	
<i>WhatsUp Gold Aplication Performance Monitor .....</i>	
<i>WhatsUp Gold FailOver.....</i>	
<b>Otras soluciones de la familia de Monitoreo y Gerenciamiento de Redes .....</b>	
<i>WhatsUp Event Log Management Suite .....</i>	
<i>WhatsUp IP Address Manager – IPAM.....</i>	
<i>AlertFox End User Monitoring.....</i>	
<b>Como el WhatsUp Gold es usado en ambientes de T.I?.....</b>	
<b>Parte 2 – Planificación y Configuración Inicial.....</b>	
<b>Requerimientos de Hardware y Software de la Herramienta .....</b>	
<b>Parte 3 – Como instalar la herramienta ? .....</b>	
<b>Parte 4 – Gerenciamiento PING, SNMP e WMI .....</b>	
<b>Fundamentos Básicos .....</b>	
Que es PING (ICMP) .....	
Que es un SNMP .....	
Como se estructura un OIDs y MIBs.....	
SNMP Community Strings .....	
Cuáles son las versiones de SNMP.....	
Que es WMI (Windows Management Instrumentation).....	
Habilitando SNMP y WMI en los sistemas operacional Windows 2003 Server .....	
Habilitando SNMP y WMI en los sistemas operacional Windows 2008 Server. ....	
Habilitando SNMP y WMI en los sistemas operacional Windows 2012 Server. ....	
Habilitando SNMP en los sistemas operacionales Linux o Unix .....	
Habilitando SNMP en los equipamientos CISCO .....	
<b>Parte 5 – Configuración Inicial de la Herramienta .....</b>	
<b>Opciones Generales del Programa.....</b>	
General .....	
Device States .....	

Passive Monitors Listeners .....	
Report Data.....	
Map Font .....	
Regional .....	
<b>Gerenciamiento de credenciales Credentials.....</b>	
<b>Email Settings .....</b>	
<b>Parte 6 – Descubrimiento y Mapeamiento de Redes.....</b>	
<b>Visión General .....</b>	
Descubrimiento de Dispositivo – (Manualmente - 1 by 1) .....	
Descubrimiento de Dispositivos \ Redes – (Discover Devices) .....	
Ajustando las configuraciones para el descubrimiento .....	
<b>Reglas de dispositivos - Device Roles .....</b>	
<b>Agendando Descubrimiento de Red – Scheduled Discovery Scan .....</b>	
<b>Parte 7 – Consola de Visualización e Gerenciamiento de Dispositivos.....</b>	
<b>Consola – Visión General .....</b>	
<b>Segmentación de Red y Grupos de Dispositivos.....</b>	
Usando y Creando Grupos (OUs), Grupos Dinámicos (Dynamic Group) y Grupos de Capa-2 (Layer-2 Group) .....	
<b>Íconos de Grupos de Dispositivos.....</b>	
<b>Herramientas de Diseño y estandarización de Mapas .....</b>	
<b>Usando comandos de display en los Mapas.....</b>	
<b>Usando la característica “Acknowledge” .....</b>	
<b>Usando “Link Lines” .....</b>	
<b>“Bulk Field Change” (Mudanza en Masa de Configuración).....</b>	
<b>Refreshing Device .....</b>	
<b>Parte 8 - Propiedades de dispositivos y Relaciones de Dependencias .....</b>	
<b>Visión General .....</b>	
<i>General .....</i>	
<i>Performance Monitors.....</i>	
<i>Active Monitor .....</i>	
<i>Passive Monitors .....</i>	
<i>Actions .....</i>	
<i>Credentials .....</i>	
<i>Polling and Maintenance .....</i>	
<i>Maintenance .....</i>	
<i>Virtualization .....</i>	
<i>Notes .....</i>	
<i>Menu .....</i>	
<i>Atributos .....</i>	
<i>Tasks .....</i>	
<b>Dependencias – Gerenciamiento dependencias entre dispositivos .....</b>	
Lecturas de las Dependencias .....	
Ajustando Dependencias .....	
<b>Critical Active Monitors .....</b>	
<b>Parte 9 - Monitores – Creación y Gerenciamiento .....</b>	
<b>Performance Monitors – .....</b>	

- Creando Monitores de Desempeño.....
- Monitores Activos .....**
- Creando Monitores Activos .....**
- Monitores Pasivos (.....**
- Creando Monitores Pasivos .....**
- Parte 10 – Acciones de Creación y Gerenciamiento .....**
- Visión General .....**
- Configurando Acciones .....**
- Action Policies.....**
- Recurring Actions .....**
- Parte 11 - Interface Web .....**
- Vision General .....**
- Dashboard .....**
- Devices .....**
- Reports .....**
- Logs .....**
- Inventory .....**
- Flow Monitor .....**
- Alert Center.....**
- Configured .....**
- Other Plug-ins (Otros Plug-ins) .....**
- Admin .....**
- Parte 12 – Paneles y DashBoards .....**
- Visión General .....**
- Como adicionar y Configurar un Panel de Visualización “DashBoard”? .....**
- Parte 13 – Informes y Registros .....**
- Visión General .....**
- Categorías de informes Dashboards .....**
- Categorías de Registros (Logs) .....**
- Imprimiendo, Exportando y Salvando los informes Dashboards y Registros .....**
- Plan de Capacidad – Generando Informes con Tendencias .....**
- Parte 14 – Centro de Alertas .....**
- Gerenciamiento Limites – Alert Center .....**
- Alert - Home.....**
- Thresholds Library - .....**
- Limite (Thresholds) .....**
- Notification Library.....**
- Notification Policies .....**
- Alert Center Reports .....**
- Alert Center Admin.....**
- Parte 15 – Usuarios y Autenticación .....**
- Autenticación Externa en el WhatsUp Gold – External Authentication .....**
- Usuarios – Creando y Gerenciamiento (Users) .....**
- Parte 16 – Herramientas de Red .....**

- Ping Tool .....
- Trace Route Tool .....
- Lookup Tool .....
- SNMP MIB Walker Tool .....
- SNMP MIB File Explorer Tool .....
- MAC Address Tool .....
- Diagnostic Tool .....
- Web Performance Monitor .....
- Web Task Manager .....
- Layer 2 Trace .....
- IP/MAC Address Finder .....

**Parte 17 – Panel NOC - Dashboard .....**  
    **Vision General .....**  
    **Instalando el Dashboard Screen Manager .....**  
    **Configurando el Dashboard .....**

**Parte 18 – Gerenciamiento, Manutención y Desempeño del WhatsUp Gold .....**  
    **Banco de Datos .....**  
        Maintaining the Database .....- Backup and Restore Backup utility . .....
- Using the Task Library .....**  
    **Services Manager) .....**

**Parte 19 – Pollers .....**  
    **Vision General .....**  
    **Tuning Performance para Polling .....**

## APÉNDICE B / APPENDIX B

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## Interconnecting Cisco Network Devices Part 1 (ICND1)

### Quién debería asistir

**Target candidates:**

Individuals seeking the Cisco CCENT certification, or Cisco CCNA Routing and Switching certification. The course is also appropriate for support technicians involved in the basic installation, operation, and verification of LAN networks.

**Key job tasks:**

**Configure:** Implement the identified solution by applying the planned implementation processes using Cisco IOS commands and applications in the correct order to the selected devices and portions of the network.

**Verify:** Use the appropriate show commands and applications to ensure that the solution was correctly implemented and is performing as desired.

**Job roles:** Entry-level network engineer, network administrator, network support technician, and help desk technician

### Prerrequisitos

The knowledge and skills that a learner must have before attending this course are as follows:

- Basic computer literacy
- Basic PC operating system navigation skills
- Basic Internet usage skills
- Basic IP address knowledge

### Objetivos del curso

Upon completing this course, you will be able to meet these objectives:

- Describe network fundamentals and build simple LANs
- Establish Internet connectivity
- Manage network device security
- Expand small- to medium-sized networks with WAN connectivity
- Describe IPv6 basics

### Contenido del curso

Interconnecting Cisco Networking Devices, Part 1 (ICND1) v2.0 is a five-day, instructor-led training course that teaches learners how to install, operate, configure, and verify a basic IPv4 and IPv6 network, including configuring a LAN switch, configuring an IP router, connecting to a WAN, and identifying basic security threats. Optionally, this course can be followed by the [Interconnecting Cisco Network Devices Part 2 \(ICND2\)](#) course, which covers topics in more depth and teaches learners how to perform basic troubleshooting steps in enterprise branch office networks, preparing learners for Cisco CCNA certification.

### Esquema Detallado del Curso

#### Day 1: Course Introduction, Building a Simple Network

- Course Introduction
- Module 1: Building a Simple Network
- Lesson 1-1: Exploring the Functions of Networking
- Lesson 1-2: Understanding the Host-to-Host Communications Model
- Lesson 1-3: Introducing LANs
- Lesson 1-4: Operating Cisco IOS Software
- Lesson 1-5: Starting a Switch
- Lab 1-1: Performing Switch Startup
- Lesson 1-6: Understanding Ethernet and Switch Operation
- Lesson 1-7: Troubleshooting common Switch Media Issues
- Lab 1-2: Troubleshooting Switch Media Issues

#### Day 2: Establishing Internet Connectivity

- Review of Day 1
  - Module 2: Establishing Internet Connectivity
  - Lesson 2-1: Understanding the TCP/IP Internet Layer
  - Lesson 2-2: IP Addressing and Subnets
  - Lesson 2-3: Understanding the TCP/IP Transport Layer
  - Lesson 2-4: Exploring the Functions of Routing
  - Lesson 2-5: Configuring a Cisco Router
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## Interconnecting Cisco Network Devices Part 1 (ICND1)

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- Lab 2-1: Performing Initial Router Setup and Configuration
- Lesson 2-6: Exploring the Packet-Delivery Process
- Lesson 2-7: Enabling Static Routing
- Lesson 2-8: Managing Traffic Using ACLs
- Lesson 2-9: Enabling Internet Connectivity

### Day 3: Managing Network Device Security

- Review of Day 2
- Lab 2-2: Connecting to the Internet
- Module 3: Managing Network Device Security
- Lesson 3-1: Securing Administrative Access
- Lab 3-1: Enhancing the Security of the Initial Configuration
- Lesson 3-2: Implementing Device Hardening
- Lab 3-2: Device Hardening
- Lesson 3-3: Implementing Traffic Filtering with ACLs

### Day 4: Building a Medium-Sized Network

- Review of Day 3
- Lab 3-3: Filtering Traffic with ACLs
- Module 4: Building a Medium-Sized Network
- Lesson 4-1: Implementing VLANs and Trunks
- Lesson 4-2: Routing Between VLANs
- Lab 4-1: Configuring Expanded Switched Networks
- Lesson 4-3: Using a Cisco Network Device as a DHCP Server
- Lab 4-2: Configuring a DHCP Server
- Lesson 4-4: Introducing WAN Technologies
- Lesson 4-5: Introducing Dynamic Routing Protocols
- Lesson 4-6: Implementing OSPF
- Lab 4-3: Implementing OSPF

### Day 5: Introducing IPv6

- Review of Day 4
  - Module 5: Introducing IPv6
  - Lesson 5-1: Introducing basic IPv6
  - Lab 5-1: Configure and Verify Basic IPv6
  - Lesson 5-2: Understanding IPv6
  - Lab 5-2: Configure and Verify Stateless Autoconfiguration
  - Lesson 5-3: Configuring IPv6 Routing
  - Lab 5-3: Configure and Verify IPv6 Routing
  - Lab: ICND1 Superlab
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## PROCEDURE

Confidential   Restricted

Free   Internal

Date **October 23, 2015**

### LNB/Filter Changeover Procedure

From **INEO**  
 To **ICAO**  
 Cc **NDSatcom**  
 Ref **ICAO REDDIG II Project**

Purpose.....	1
Scope of work.....	1
Hardware modification.....	2
Software modification.....	5
Verification of Operational stations .....	5

### PURPOSE

The objective of this change is to get better the reception signal of all Reddig II stations.

The idea is to change the actual internal referenced LNB to news external referenced ones. The aim is that the NDSatcom Skywan, which is the satellite modem, could send itself the 10 MHz reference to the LNB in order to improve the LNB accuracy for catching up bursts from the Master station.

N.B.: For the Tx part, confirmation has been given by Terrasat that current iBUCs accept to receive an external 10 MHz reference without any hardware change.

### SCOPE OF WORK

In a first step, the possibility of this change has to be confirmed in one site. It will be in Manaus for logistical reasons, and as TDMA Master of the network.

#### INEO ENGINEERING & SYSTEMS

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INEO ENGINEERING & SYSTEMS – SNC AU CAPITAL DE 1 409 980,00 EUROS – RCS VERSAILLES B 419 173 364 - SIEGE SOCIAL : 23 RUE GENERAL VALERIE ANDRE – INOVEL PARC SUD - 78140 VELIZY VILLACOUBLAY

Then, in a second step, the solution will be deployed in 3 other sites, in order to see if the changeover is improving the TDMA situation (see below). These sites have been chosen by NDSatcom, because they are relevant to observe the improvement for the following reasons:

- Manaus (SBMN): as main TDMA master station
- Ezeiza (SAEZ): as backup TDMA master station
- Lima (SPIM): station where Rx trouble logs have been identified
- Recife (SBRE): station with the highest number of issues occurred

Finally, if the solution is confirmed, it will be deployed in the whole network.



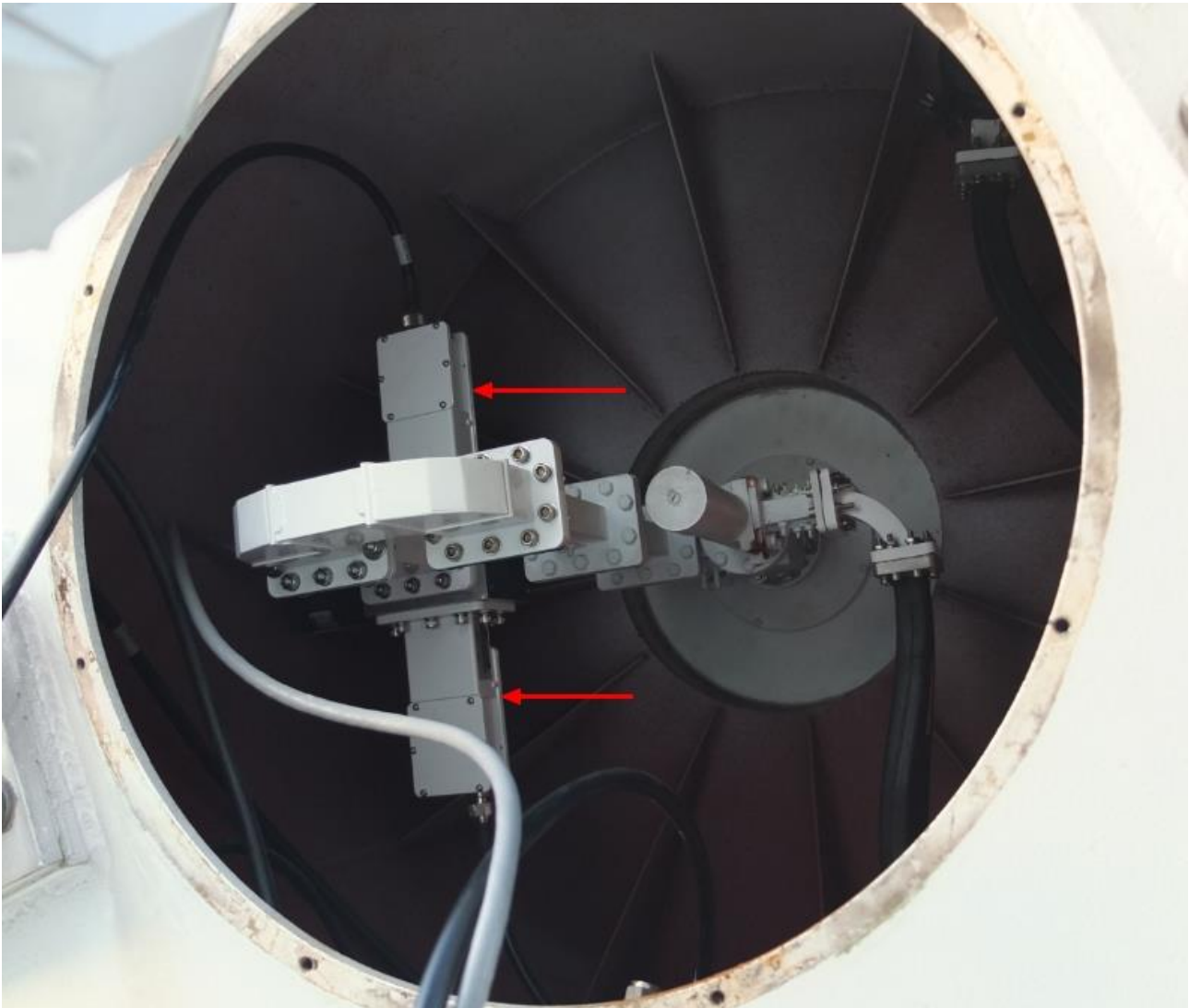
Figure 1 - Second step of changeover

## HARDWARE MODIFICATION

Currently, Norsat 3120N LNB, with internal reference, are installed on site (see datasheet attached). They will be replaced by two Norsat 3020XN ones (see datasheet attached).

As they have same connectors, fixation, and almost same length, the replacement will not be a problem.

See below a view of the current configuration and future locations of new LNB equipment:



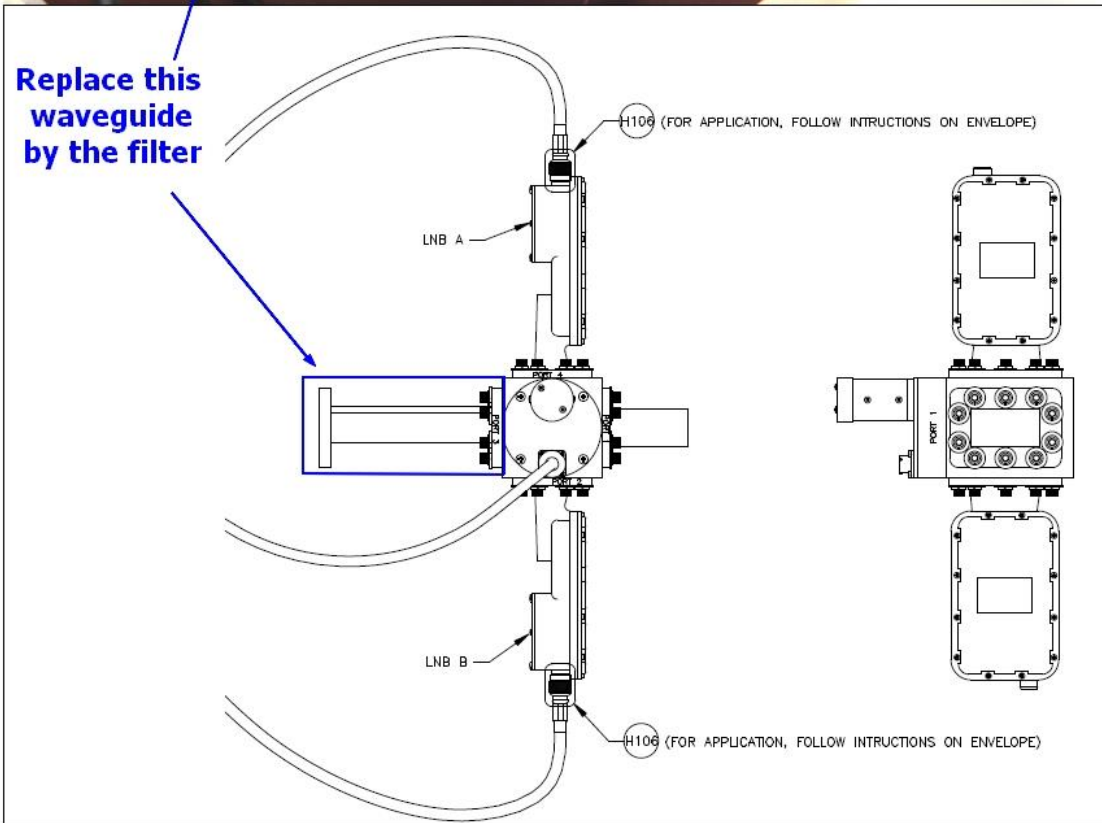
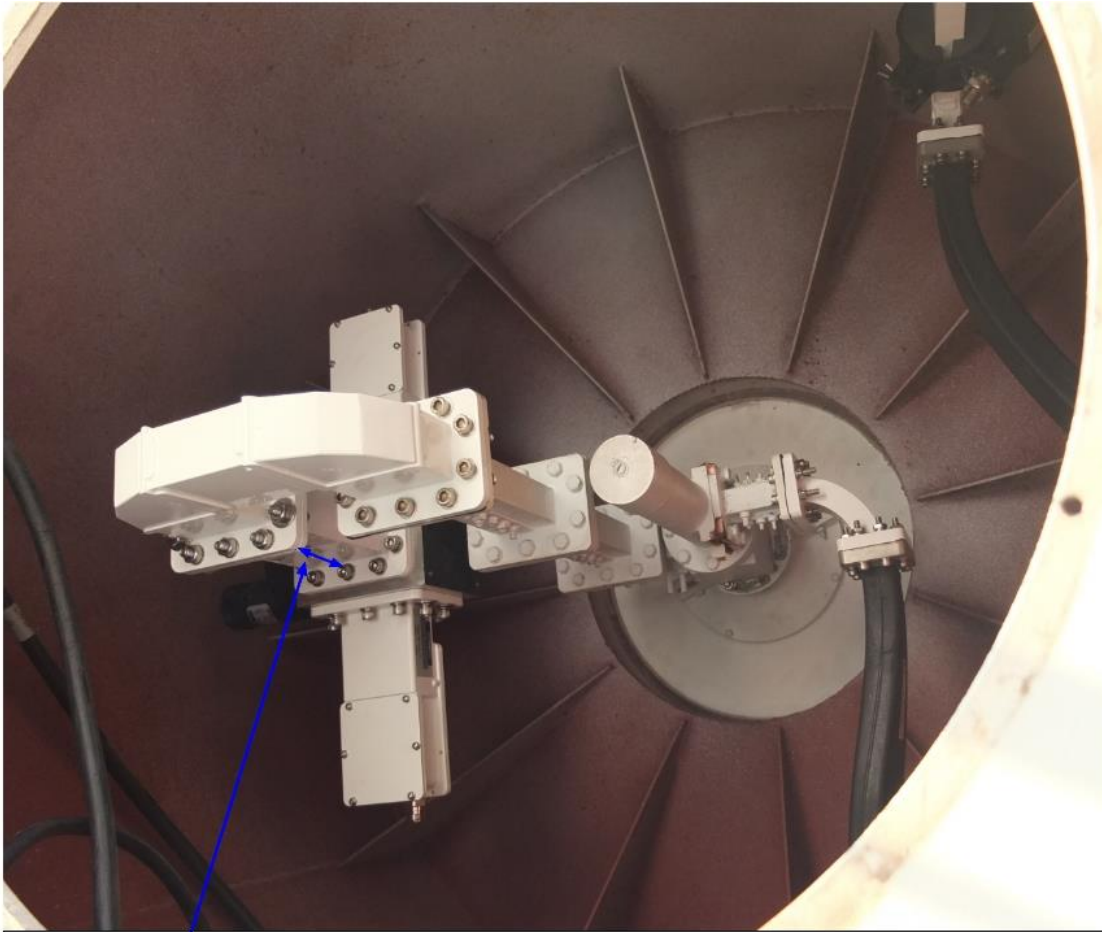
**Figure 2 - LNB to be changed**

Additionally, to guaranty the isolation of the received signal from any interference (Wimax, Radar...), a C-band pass filter will be added between the Rx-switch and the waveguide from the source.

This filter has already been provided in Lima. Model is BPF-C-1 (see datasheet attached).

This modification will induce a 0.5dB loss in the link budget. An engineering study is determining sites where adding this filter will not have any impact on the link budget. The filter will be installed only after this validation.

Confirmation has been given by Terrasat that we can replace the waveguide identified in the following figure, by the filter.



**Figure 3 - Waveguide to be replaced by a filter**

## SOFTWARE MODIFICATION

As now the Skywan modem has to send the 10MHz reference to the LNB, and to avoid too many hardware changes, the NMS system will control the reference source.

The solution is currently in approval process over the Brasilia system, which is in integration phase in Cofely INEO factory.

It implies a modification in the WhatsUp Gold configuration, the NMS software. A new Action Policy will be added in each site, as it is already configured to switch from chain A to chain B.

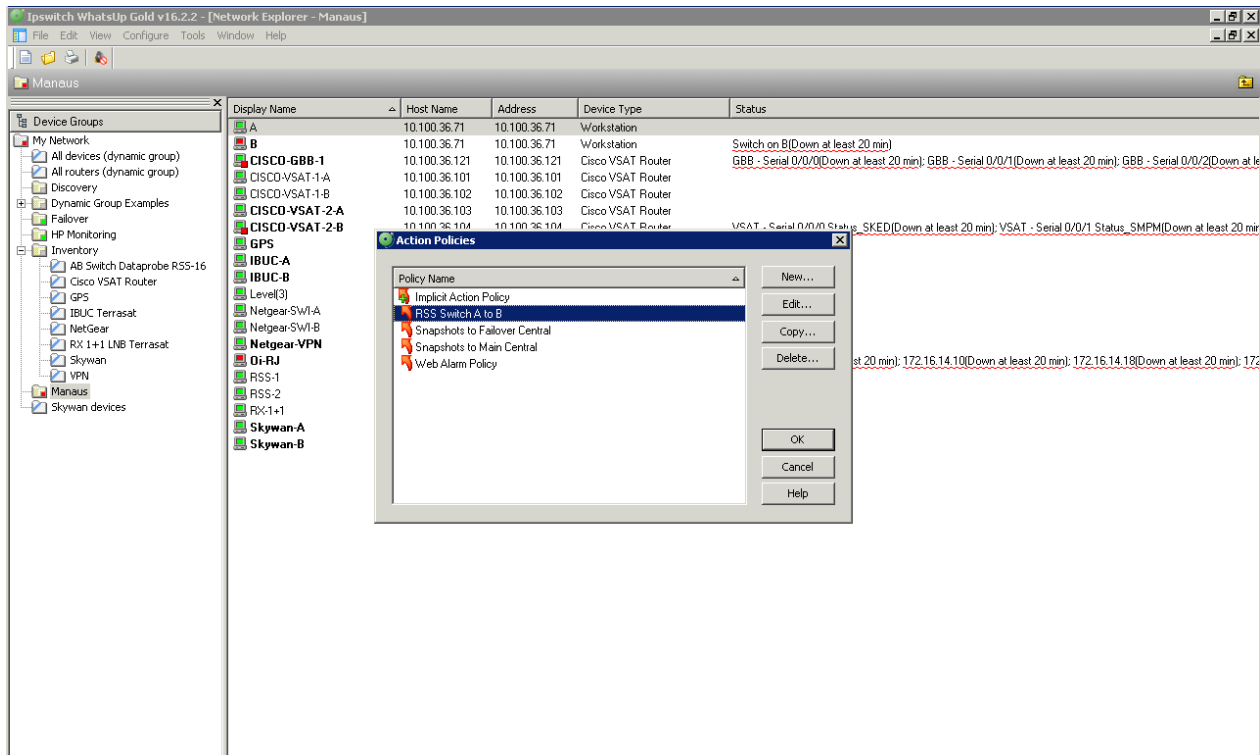


Figure 4 - WhatsUp Gold Action policies

This policy will permanently control which Skywan is assuming traffic, and send via SNMP the command to both Skywan to make them send the 10 MHz reference to "panelOnly" or "TxAndRxCable". In no case both Skywan have to be in the situation of sending at the same time its reference.

## VERIFICATION OF OPERATIONAL STATIONS

To see improvements of the solution deployed, several values will be observed in the SkyNMS after deployment in the first four sites. This list has been made in cooperation with NDSatcom.

1. Check power level for 8 PSK FEC 2/3 1 MSymbol ( 10-8 min 9 dB EsToNo; 10-7 min 8.6 dB EsToNo) suggested min mod max value 90, 110,120
2. Check EsToNo level RX from each individual station (should be not lower than EsToNo min )
3. Check channel input power ( - 35dbm to - 70 dbm)
4. Check Header CRC errors (should not count up)
5. Check Frame plan crc errors (should not count up)
6. Check Frame plan loss count (should not count up)
7. Check Satmux bad dummy bits received by station
8. Check frequency drift with graph



## Innovative Communication Solutions

# LNB

## C-BAND EXT. REF. 3000X



### TYPICAL SPECIFICATIONS

<b>Noise temperature</b>	20 K to 30 K depending on model number
<b>L.O. stability</b>	Phase Locked to External Reference
<b>Gain Flatness (-40°C to +60°C)</b>	1dBp-p @ 36 MHz
<b>Gain Variation @ Fixed Freq. (-40°C to +60°C)</b>	6 dBp-p max
<b>Phase noise (SSB)</b>	-70 dBc/Hz at 1 kHz -83 dBc/Hz at 10 kHz -93 dBc/Hz at 100 kHz
<b>Input VSWR</b>	2.3 : 1
<b>Output VSWR</b>	2.0 : 1

<b>Conversion gain</b>	62 dB
<b>Output P1dB</b>	5 dBm
<b>Power requirements</b>	±15 to ±24 V supplied through center conductor of IF cable
<b>Current drain</b>	200 mA
<b>Input Waveguide</b>	CPR229G
<b>Dimensions</b>	180 (L) x 100 (W) x 70 (H) mm (7.1 x 4.0 x 2.8 in)
<b>Weight</b>	425g / 15 oz
<b>Ext. Ref. Frequency</b>	10 MHz (sine-wave) -10 to 0 dBm
<b>Temperature Range</b>	-40°C to +60°C

### FREQUENCY BANDS AVAILABLE

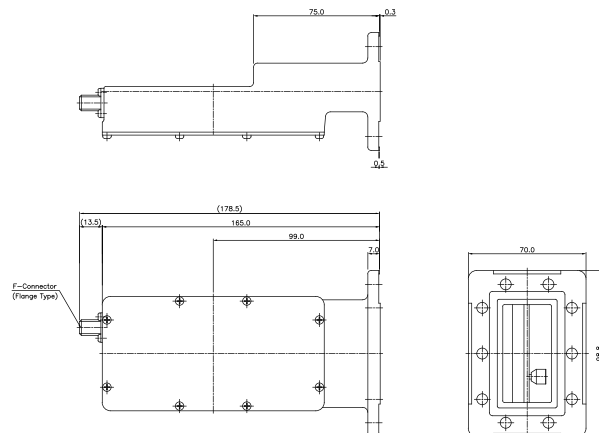
<b>Input frequency (GHz)</b>	3.40 to 4.20
<b>L.O. frequency (GHz)</b>	5.15
<b>Output frequency (MHz)</b>	950 to 1750

### HOW TO ORDER

## 3020XN

CONNECTOR	F - 75 Ohm N - 50 Ohm
EXTERNAL REFERENCE	
NOISE TEMPERATURE	20 - 20 K 25 - 25 K 30 - 30 K
LNB SERIES #	

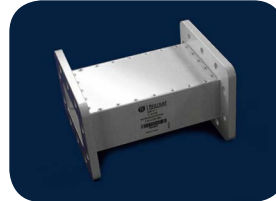
### MECHANICAL DIAGRAM





# MICROWAVE COMPONENT

## C-BAND BAND PASS FILTER



### APPLICATIONS

- Rejects terrestrial interference in C-Band (WiMAX, Radar and C-Band transmitter)
- Easily installed between the feed and LNB
- Suitable for use with Norsat's C-Band LNBs
- Environmentally sealed and moisture resistant

### TYPICAL SPECIFICATIONS (BPF-C-1)

<b>Frequency range</b>	3.70 to 4.20 GHz
<b>VSWR</b>	1.4 : 1
<b>Insertion loss in band</b>	0.5 dB
<b>Waveguide flange</b>	CPR-229 (input), CPR-229F (output)
<b>Dimensions</b>	120 (L) x 100 (W) x 70 mm
<b>Weight</b>	650 g

### TYPICAL SPECIFICATIONS (BPF-C-2)

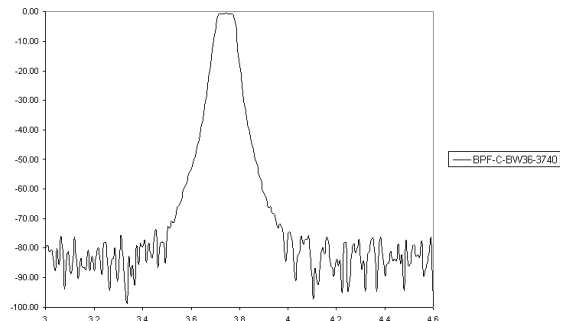
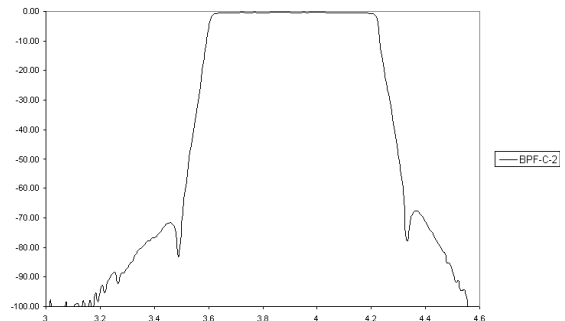
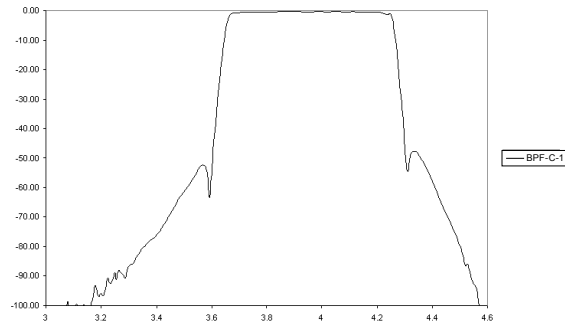
<b>Frequency range</b>	3.625 to 4.20 GHz
<b>VSWR</b>	1.4 : 1
<b>Insertion loss in band</b>	0.5 dB
<b>Waveguide flange</b>	CPR-229G (input), CPR-229F (output)
<b>Dimensions</b>	120 (L) x 100 (W) x 70 mm
<b>Weight</b>	650 g

### TYPICAL SPECIFICATIONS (BPF-C-BW36-CF)

- BPF-C-BW36-CF is used for interference inside the standard receiver bands.
- The filter is a single transponder bandpass filter. The Center Frequency (CF) is determined by the individual customer's requirements.

<b>Center Frequency (CF)</b>	xxxx MHz
<b>Bandwidth</b>	36 MHz
<b>VSWR</b>	1.4 : 1
<b>Insertion loss in band</b>	0.6 dB
<b>Waveguide flange</b>	CPR-229G (input), CPR-229F (output)
<b>Dimensions</b>	120 (L) x 100 (W) x 70 mm
<b>Weight</b>	650 g

### FREQUENCY PLOTS





File update: 21/2016 16:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P3SAEZ02056	closed	P	3	Argentina	SAEZ	Ezeiza	6	Numero de emergencia dedicado GBB router (Fig 46, se comunica con Maricao con el numero 73601 y no con el numero indicado en la tabla de la figura 46	5 February 2015	To be corrected		27/03/2015 => Request 01/02/2015 cancelled => signal tested on Maricao 27/03/2015 cancelled on 30/03/2015/2015, pending test 21/09: new Cisco configurations are to be sent before end of september	16/04/2015 26/04/2015 16/05/2015 20/05/2015 end of september		Solved and closed	Closed Solved	INEO
P2SAEZ02057	closed	P	2	Argentina	SAEZ	Ezeiza	7	Fallo de conexión en el enlace de enlace Maricao, Brasil, Guyana, Paraguay y SGAS when using the terrestrial link	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)		25/02/2015 => New request retransmitted to Level 3 06/03/2015 => individual tests to be performed 27/03/2015 => tests conducted by LE were successful, except French Guiana. Procedure sent on 27th of March for individual tests. 22/05/2015: pending test result (22/05/2015) 15/07: General state is ok, pending one issue with AMHS with Paraguay. 21/09/15: new test is to be done before end of september to determine where is localised the problem (AMHS works without problem on the VSAT link)	16/04/2015 20/04/2015 20/04/2015 17/7/2015 end of september 2015		closed	OK Operational December 2015	OK
P3SAEZ02058	CLOSED	P	3	Argentina	SAEZ	Ezeiza	8	No se suministra el acceso a la página WEB de LEVEL 3 para la gestión de servicio	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)				LEVEL 3	closed	OK The user name and password to access LEVEL was sent March 27th	ok
P4SAEZ02059	CLOSED	P	4	Argentina	SAEZ	Ezeiza	9	Dos conectores RJ45 del Patch Panel dañados	5 February 2015	To be corrected - New connectors will be sent to FP		16/04/2015 16/04/2015 16/04/2015 08/04/2015 => Delivery cancelled due to AFIP restrictions (cf. mail Javier Vitor 08/04/2015)		4/8/2015	closed	OK	ok
P2SAEZ022410	closed	P	2	Argentina	SAEZ	Ezeiza	10	Continue intermittent problem in the AFTN circuit between Argentina and Brazil, Uruguay and Paraguay. Controllers report lost of flight plan	25 February 2015	Under analysis		27/11/15 => Procedure for BER test targetted Marsh 02th => expected coordination from ICAO- Lima and FP to proceed 06/03/15 => waiting for a new diagnostic after Lima analysis 12/03/2015 => AFTN test conducted between SAEZ and SUMU and then will be spread 27/03: new tested to be conducted at SUMU and SAEZ. In addition to that, hardware was bought by INEO to perform tests at INEO facility 10/04/2015 => INEO engineer sent at Guayaquil for network-wide test. 27/05: Lab test on-going, local BER tests resulted with initialization issue and latency but regular BER is ok. Further progress expected next week 15/07: as per precedent emails, retransmissions are not caused by REDDIG network.	16/04/2015 20/04/2015 20/04/2015 17/7/2015		Solved and Closed	Solved and Closed	INEO Solved and closed
P1SAEZ020511	closed	P	1	Argentina	SAEZ	Ezeiza	11	AMHS circuit between Ezeiza and Asunción	5 February 2015			30/04: solved and closed as per email 30/04 (clement chevallier), email from J. Vitor on 27/04			closed	OK	ICAO OK Solved in the REDDIG II satellite network additional test is required for the REDDIG II ground network

File update: 2/1/2016 18:18							REDDIG-II - Pending issues											
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue	
O1SLLP17021	CLOSED	O	1	Bolivia	SLLP	La Paz	1	Communication problem with Manaus according to the email from ICAO (17th Feb.)	17 February 2015	OSPF Pb under analysis -> Looking for a technical solution to be implemented	diagnostic on course after identification of the problem on the routing table with Level 3 expected resolution for 25/02	25/02/2015 => New configuration was tested by Level 3, it was ok. No action under recommendation made by our expert (COE verified) 27/02/2015 => New configuration implemented, solution monitoring under observation 05/03/2015 => Improvement of the routing observed, but still to be confirmed 12/03/2015: communication test achieved with SOCA, pending test with SLLP	28th March 2015 Test to be performed on 16th March 2015  test performed successfully			closed	OK	
P2SBMN02051	closed	P	2	Brazil	SBMN	Manaus	1	Circuito AFTN Manaus Lima no funciona	5 February 2015	1/ Check of the Cisco configuration 2/ Local check-up with one of our expert (on-site) in Lima As soon as we have define where exactly is the problem, INEO E&S will correct the bug.	Problem identified	26/02/2015 => Test must be conducted in cooperation with Manaus AFTN center and REDDIG-II technical persons, waiting for their availability. 05/03/2015 => Problem solved, distrubings still appear but were already identified in Reddig I 10/04/2015 => INEO engineer sent at Cayash for network-wide test. Improvement was noticed by Corpac 30/04: continuous test asked, to validate new configuration. 27/05: Lab test on-going, local BER tests resulted with initialization issue and latency but regular BER is ok. Further progress expected next week. 15/07: BER ok, service ok.	26th March 2015 28th March 2015 28th March 2015 17/7/2015		solved and closed	Solved and closed	INEO Solved and closed	
P4SBMN02052	closed	P	4	Brazil	SBMN	Manaus	2	Pendiente actualización diagramas circuitales	5 February 2015	As-built under realization		Closing date includes finalization of drawings for ALL sites 27/03: documents achieved, to be shipped on Monday 30th March 2015 Proof of delivery to the end user at your disposal 22/05/2015: observations received from Manaus up to the the 22th of May will be corrected 15/07: As built delivered	26th March 2015 28th March 2015 28th March 2015 17/7/2015		solved and closed	CLOSED Documents and CD received with modification in the circuit diagrams P	ICAO Solved and closed	
P3SBMN02053	closed	P	3	Brazil	SBMN	Manaus	3	La perdida de paquetes en la red terrestre están por encima de lo que especifica el SLA de LEVEL 3	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)		25/02/2015 => New request retransmitted to Level 3 06/03/2015 => individual tests to be performed 27/03/2015 => tests conducted by LE were successful, except French Guiana. Procedure sent on 27th of March for individual tests. 22/05/2015: pending test result (22/05/2015) 15/07: after failure constated on the end of June, no more failure experienced.	26th March 2015 28th March 2015 28th March 2015 17/7/2015	LEVEL 3	solved and closed	OK Closed and Solved	LEVEL 3 INEO and ICAO Closed and Solved	
P3SBMN02054	CLOSED	P	3	Brazil	SBMN	Manaus	4	Pruebas en los circuitos administrativos, conmutados ATS y AFTN realizados en una sola cadena en la red terrestre	5 February 2015	During the PSAT, it appears that this test was already performed. It could be easily checked, and upon request by ICAO, it could be done during the ORD period with the local FP and INEO remote coordination		27/02/2015 => INEO technicians were contacted on 27/02/15 05/03/15 => Test done with success	28th February 2015	3/5/2015	closed	OK closed	ok	



File update: 21/2016 18:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P4SBMN02011	CLOSED	P	4	Brazil	SBMN	Manaus	11	Pruebas pendiente en circuitos orales ATS, administrativos AFTN en una de las cadenas de la red satelital	5 February 2015	During the PSAT, it appears that this test was already performed. It could be easily checked, and upon request by ICAO, it could be done during the ORD period with the local FP and INEO remote coordination		27/02/2015 -> INEO technician checked the test on site 06/03/2015 => Waiting for Result report	10th March 2015	3/10/2015	closed	OK solved	OK
P1SBRF05021	closed	P	2	Brazil	SBRF	Recife	1	Perdida de paquetes en la red terrestre LEVEL 3 con todos los nodos	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)		02/02/2015 -> New request implemented in level 3 08/02/2015 -> additional tests were performed 17/02/2015 -> tests conducted by ICAO were successful, except Flight Display Procedure test on 27th of March for individual tests 22/02/2015, pending test results 15/07: no more issue	10th March 2015 10th March 2015 17/7/2015	LEVEL 3	solved and closed	Closed	Closed and Solved
P4SBRF05022	closed	P	4	Brazil	SBRF	Recife	2	Pendiente pruebas BER AFTN	5 February 2015	During the PSAT, it appears that this test was not the priority. Now, it's difficult to perform it because it means that States will have to cut the services. If requested by ICAO, it could be done during the ORD period with the local FP and INEO coordination		27/07/15 -> Procedure for BER test targeted (test 100) -> proposed coordination from ICAO (test and FP to proceed) 08/08/15 -> waiting for a new diagnosis and time analysis 12/02/2015 -> AFTN test conducted between SAE2 and SBMM and then on a second 27/05: new request to be conducted in SBMM and SAE2. It appears that resolution was accepted by INEO to perform tests at INEO facility 03/02/2015 -> INEO technician sent test proposal for network test 27/02: tests are ongoing, local BER tests required with implementing issue and already but request BER is OK. Further progress expected next week 15/07: no issue regarding this point as far as known	10th March 2015 10th March 2015 17/7/2015	OK Closed and Solved	OK Closed and Solved	INEO Closed and Solved	
P3SBRF05023	closed	P	3	Brazil	SBRF	Recife	3	Falsa alarma NMS (IBUC) y RX 1 + 1	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress		07/02/2015 -> Problem identified -> implementation of the solution in progress, to be achieved on 03/07/15 02/02/2015 -> new NMS version identified, graphical issue on representation 10/04/2015 -> INEO technician mission completed 20/05/2015 -> INEO technician mission for HDD storage and copy 05/07: INEO received the device for performance equalization, reported delay on the 21/09: problem solved after total NMS check between the 7th and 21th of september	10th March 2015 10th March 2015 17/7/2015	pending	Noted the new date week of 20July	INEO

File update: 2/1/2016 16:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P2SCEL02051	closed	P	2	Brazil	SBCT	Curitiba	1	Switching of LNB does not work	5 February 2015			20/02/2015 - INEO technician received information from client that LNB was not working properly. 15/07: switch changed, reported ok by technician.	20th March 2015 20th March 2015 20th March 2015 17/7/2015		Closed and Solved	OK Closed and Solved	INEO ok Closed and Solved
P3SCEL05021	CLOSED	P	3	Chile	SCEL	Santiago	1	Dañada pantalla del reloj GPS	5 February 2015	New equipment received in INEO Premises. Will be sent to the site asap		20/02/2015 - Equipment received from manufacturer. 20/04/2015 - New equipment received, installed and correctly working (recovery of faulty equip to be organize by INEO)	20th March 2015 20th March 2015 20th March 2015 17/7/2015	4/20/2015	closed and solved	OK Closed	OK INEO sent the equipment
P3SCEL05022	closed	P	3	Chile	SCEL	Santiago	2	NMS: refresco cambios de estados muy lento	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	18/02/2015 - In local NMS it appears correct, parallel to the client NMS it is not possible to improve it due to hardware. 20/02/2015 - Information requested to subcontractor for webbrowser configuration. 15/07: implementation Opera or Chrome in 64bits version shows better results in latency.	20th March 2015 20th March 2015 20th March 2015 17/7/2015	3/6/2015	solved and closed	OK Closed and Solved	INEO Closed and Solved
P3SCEL05023	CLOSED	P	3	Chile	SCEL	Santiago	3	Calidad de la imagen no mejorada aspecto pendiente desde la FAT	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	18/02/2015 - Problem identified. 20/02/2015 - Implementation of the solution in premises. 18/03/2015 - New NMS aspect approved by ICAO. (Images attached in excel file as requested in table).	20th March 2015 20th March 2015 20th March 2015 17th March 2015	3/17/2015	closed	OK	
P3SCEL05024	closed	P	3	Chile	SCEL	Santiago	4	WEB IBUC : La indicación de voltaje no corresponde al valor real	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	18/02/2015 - Problem identified. 20/02/2015 - Implementation of the solution in progress. To be achieved on 02/03/15. 20/03/2015 - Information requested to subcontractor on 20/03/2015, pending status that. Sent back on 22/03/2015. 15/07: as per manufacturer advise, this is not an issue (email 9/6/2015).	20th March 2015 20th March 2015 20th March 2015 17/7/2015		solved but not closed	Not closed Not relevant issue Chile reported that the problem was not solved	INEO Chile is reporting wrong lecture since the PSAT The manufacturer reported not relevant issue
P4SCEL05025	closed	P	4	Chile	SCEL	Santiago	5	Pendiente actualización de los diagramas	5 February 2015	As-built under realization		Closing date includes finalization of drawings for ALL sites. 27/03: documents achieved, to be shipped on Monday 30th March 2015 Proof of delivery to the end user at your disposal 22/05/2015: observations received from Manaus up to the the 22th of May will be corrected. 15/07: As built delivered	20th March 2015 20th March 2015 20th March 2015 17/7/2015		solved and closed	CLOSED Documents and CD received with modification in the circuit diagrams P	ICAO Solved and closed

File update: 2/1/2016 18:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P1SCEL05026	closed	P	1	Chile	SCEL	Santiago	6	Circuito AFTN con Lima no operativo	5 February 2015	1/ Check of the Cisco configuration 2/ Local check-up with one of our expert As soon as we have define where exactly is the problem, INEO E&S will correct the bug.	requested to FP to check cabling and RJ45 adaptor potential problem	2/1/16: - Procedure for BER test register Manaua - Expedited coordination from ICAO and FP is proceed - 02/01/16 -> waiting for a new diagnosis and Lima analysis - 02/02/16 -> AFTN test completed between SAEZ and SUMU and Lima test is proceed - 2/05/16: Lima tested to be completed at SUMU and SAEZ. In addition to that, test results was receipt by INEO to perform tests at INEO facility - 02/02/16 -> INEO register test as Solved for the test was Manaua - 02/05/16: Lima test completed from BER tests register with initialization done and Manaua did register BER is ok. Further progress expected next week. 15/07: Lima reported circuit as OK.	02/01/2016 02/02/2016 02/05/2016 17/7/2015	4/20/2015	solved and closed	OK Solved and Closed	INEO Closed and closed
P4SCEL05027	closed	P	4	Chile	SCEL	Santiago	7	Pendiente prueba BER AFTN	5 February 2015	During the PSAT, it appears that this test was not the priority. Now, it's difficult to perform it because it means that States will have to cut the services. If requested by ICAO, it could be done during the ORD period with the local FP and INEO coordination		2/1/16: - Procedure for BER test register Manaua - Expedited coordination from ICAO and FP is proceed - 02/01/16 -> waiting for a new diagnosis and Lima analysis - 02/02/16 -> AFTN test completed between SAEZ and SUMU and Lima test is proceed - 02/05/16: Lima tested to be completed at SUMU and SAEZ. In addition to that, test results was receipt by INEO to perform tests at INEO facility - 02/02/16 -> INEO register test as Solved for the test was Manaua - 02/05/16: Lima test completed from BER tests register with initialization done and Manaua did register BER is ok. Further progress expected next week. 15/07: BER test ok, as per tests from Manaua	02/01/2016 02/02/2016 02/05/2016 17/7/2015		closed and solved	OK Solved and Closed	INEO Closed and Solved



File update: 21/2016 16:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P2SEGU05022	closed	P	2	Ecuador	SEGU	Guayaquil	2	Perdida de paquetes red terrestre Level 3 con Manaus, Recife Guyana Uruguay	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)		25/02/2015 -> New request transmitted to Level 3 25/02/2015 -> Initial tests to be performed 22/05/2015 -> Test conducted in US was successful, except for a Config Procedure not on 220.44.44.44 for 100.0.0.0/24 22/05/2015: pending test result (22/05/2015) 15/07: no failure reported	2015/02/25 2015/05/22 2015/07/17	LEVEL 3	Solved and Closed	Solved and Closed	INEO & LEVEL 3
P4SEGU05023	Closed	P	4	Ecuador	SEGU	Guayaquil	3	Pruebas BER AFTN pendientes	5 February 2015	During the PSAT, it appears that this test was not the priority. Now, it's difficult to perform it because it means that States will have to cut the services. If requested by ICAO, it could be done during the ORD period with the local FP and INEO coordination		27/1/15 -> Provision for BER test updated from local -> pending coordination from ICAO and local FP in general 05/02/15 -> waiting for a new diagnostic from ICAO 12/02/2015 -> AFTN test conducted between SAEZ and SAMA and then on 16/02/2015 02/03/2015 -> test to be conducted on SAMA and SAEZ. In addition to test, test was also done by INEO to perform tests at INEO facility 04/03/2015 -> INEO engineer sent to Ecuador for network side test 27/05/2015/03/03/2015: local BER tests passed with no reported issues and many other related BER in the Ecuador network followed test with 15/07: no issue reported since new configuration in June, generalized configuration of the successful one.	2015/02/27 2015/03/04 2015/03/16 2015/07/17		Solved and Closed	Solved and Closed	INEO
P3SEGU05024	CLOSED	P	3	Ecuador	SEGU	Guayaquil	4	Prueba Tx switch (7.1.1) no pasó	5 February 2015	After analysis, it appears that the IBUC needs to be updated. To do so, we need to be contacted directly to the equipment. INEO requests from ICAO the support from the local FP in order to perform this action.		27/02/2015 -> Provision for test sent by INEO to FP as per item P327E2R05024 (Paso) 09/03/2015 -> procedure sent, but some connection issues happened before solved by the station already working 09/03/2015 => problem solved according to email from Raul Avellan of 09/03	28 February 2015	2/28/2015	closed	OK solved	ok
P3SEGU05025	CLOSED	P	3	Ecuador	SEGU	Guayaquil	5	Voz IP teleconferencia calidad pésima	5 February 2015	1/ Diagnostic of the current configuration 2/ New configuration to be proposed after analysis 3/ Configuration implemented, to be tested (12/03)		25/02/2015 -> diagnostic call to progress 03/03/2015 -> problem configuration changed test passing 27/03/2015 -> test performed with success, successful 09/04/2015: Pending test with new firmware 22/05/2015: new firmware not successful 15/07: during teleconference tests in June, quality was good	2015/02/25 2015/03/03 2015/07/17		Quality of voice ok but not the IP telephone system	Quality of voice ok but not the IP telephone system	INEO

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P3SEGU05026	closed	P	3	Ecuador	SEGU	Guayaquil	6	Falsas alarmas de operación de las interfaces seriales y E1	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	05/02/15 => Problem identified 06/02/15 => Implementation of the solution in progress 07/02/15 => Issue resolved, request to test communication properly between NMS and routers on SSH connection is not operative 21/09: solved after NMS works	06/09/2015 06/09/2015 06/09/2015 15/09/2015		Pending	OK action on progress but not completed. Noted the new date week of 20th July	INEO Pending
P4SEGU05027	CLOSED	P	4	Ecuador	SEGU	Guayaquil	7	Pending ATS voice circuit test between Guayaquil and CENAMER	5 February 2015	1/ Analysis of the current configuration 2/ Pending to interconnection between Bogota/Maiquetia and Honduras	resolution pending of the item P1SCEK05021	09/02/2015 09/02/2015: Issue solved, phone number changed in CENAMER 09/02/2015: Pending Skyway availability in Honduras 27/03: installation solved 20/04/2015 => On monitoring	09/02/2015 09/02/2015 20/ March 2015		closed	OK Solved but not closed the circuit is under observation	ICAO OK Solved
P4SOCA05021	CLOSED	P	4	French Guiana	SOCA	Cayenne	1	El conector de energía del teléfono IP no funciona	5 February 2015	A solution will be proposed by INEO to the site		06/02/2015: Problem identified 06/02/2015: Implementation of the solution in progress 06/02/2015: Issue resolved, request to test communication properly between NMS and routers on SSH connection is not operative 17/03/2015 => closed as per email of 17th of march	06/02/2015 06/02/2015 17 March 2015	3/17/2015	closed	OK	
P4SOCA05022	CLOSED	P	4	French Guiana	SOCA	Cayenne	2	Diagramas circuitales incorrectos (WVG)	5 February 2015	As-built under realization		Closing date includes finalization of drawings for ALL sites 27/03: documents achieved, to be shipped on Monday 30th March 2015 Proof of delivery to the end user at your disposal 22/05/2015: observations received from Manaus up to the 22th of May will be corrected 15/07: As built delivered	06/02/2015 06/02/2015 06/02/2015 17/7/2015		solved and closed	CLOSED Documents and CD received with modification in the circuit diagrams P	ICAO Solved and closed
P3SOCA05023	CLOSED	P	3	French Guiana	SOCA	Cayenne	3	Dificultad leer la dirección IP del WVG	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	05/02/15 => Problem identified 06/02/15 => Implementation of the solution in progress 09/02/15 => Issue resolved, request approved by OTCI to deployment of NMS, to be deployed in all sites 22/05/2015: updated representation of IP/C location to be deployed 15/07: graphic actualized	06/02/2015 06/02/2015 06/02/2015 17/7/2015		solved and closed	Solved and closed	INEO
P3SOCA05024	CLOSED	P	3	French Guiana	SOCA	Cayenne	4	Error en la interface LAN no trabaja	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	05/02/15 => Problem identified 06/02/15 => Implementation of the solution in progress, to be deployed on 09/02/15	06/02/2015 06/02/2015 06/02/2015 20th March 2015	3/20/2015	closed	OK	
P3SOCA05025	CLOSED	P	3	French Guiana	SOCA	Cayenne	5	Modem B no va en verde cuando se enciende	5 February 2015	1/ Diagnostic with FP to be performed 2/ If faulty equipment, will open an RMA number to replace the equipment	Analysis in progress with NDSatcom	05/02/2015 05/02/2015: Issue solved, all new software was an upgrade procedure for the routers 09/02/15 27/03: ND Satcom is still working on the new version. Solutions should be exposed next week 10/04: New version to be deployed next week. Sky/NMS 3.25 already installed at Manaus 20/04: Software uploaded, test ok	06/02/2015 06/02/2015 06/02/2015 24th April 2015		closed	OK	

File update: 21/2016 16:16							REDDIG-II - Pending issues										
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P2SOCA05026	closed	P	2	French Guiana	SOCA	Cayenne	6	Problema posterior con el circuito AFTN con Manaus	5 February 2015	1/ Check of the Cisco configuration -> Conf. OK 2/ Discussions undergoing with local FP	problem already observed during REDDIG 1 operation	2/05/15 test already local BFR tests carried with indication issue and already but reported RED to local partner 15/07: no issue reported since new configuration implemented in June	16th March 2015 20th March 2015 17/7/2015		closed and solved	Closed and Solved	INEO
O1SOCA05027	CLOSED	O	1	French Guiana	SOCA	Cayenne	7	Communication problem with Manaus according to the email from ICAO (17th Feb.)	17 February 2015	OSPFB Pb under analysis -> Looking for a technical solution to be implemented	Resolution pending of the Item M1SLLP17021	25/02/2015 -> New configuration will be tested by local partner in 2 weeks, in 20 weeks under recommendation made by our ICAO expert (COE confirmed) 27/02/2015 -> New configuration implemented, solution monitoring under way 28/02/2015 -> Improvement of the status observed, the call to be repeated 12/03/2015: test successful, only SYGC was out due to last mile issue	20 March 2015	3/12/2015	closed	OK	
P3SYGC05021	CLOSED	P	3	Guyana	SYGC	Georgetown	1	No hay indicación de status en uno de los switches en el MAP VIEW	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	20/03/15 -> Problem identified -> Implementation of this solution in progress, to be achieved on 20/04/15 20/04/2015 => both switches are up	16th March 2015 20th March 2015 24th April 2015		closed	OK Solved	ICAO OK Solved
P3SYGC05022	CLOSED	P	3	Guyana	SYGC	Georgetown	2	No se puede hacer setting en las interfaces de voz	5 February 2015	INEO sent an email on the 18th Feb. explaining that modifications on voice interfaces are possible, mainly to change the attenuation or the gain to make the communication better. We sent to the FP a procedure.			18 February 2015	2/18/2015	closed	OK closed	
O1MHTG12051	CLOSED	O	1	Honduras		Tegucigalpa	1	Solicitud de activación de los servicios (email 12/02/2015)	12 February 2015	Procedure to declare the new station in the network to be done	problem identified and expected resolution for 21/02	21/02/2015 -> Station already declared 21/04/2015 => On monitoring	25th february 2015		closed	OK Solved	ICAO OK Solved
P4SGAS05021	CLOSED	P	4	Paraguay	SGAS	Asuncion	1	Alarma sonora de la UPS en modo batería, prácticamente inaudible	5 February 2015	The equipment is working as presented during the FAT. Please precise the issue.			20th March 2015		closed	OK Solved	OK
P3SGAS05022	closed	P	3	Paraguay	SGAS	Asuncion	2	No se cuenta con el antivirus que se halla especificado en el Documento REDDIG II SDD Scope of Supply Rev. F	5 February 2015	To be provided by INEO		27/02/2015: antivirus already installed (no remaining systems) 28/02/2015: information in progress 28/02/2015: antivirus operation pending procedure to be sent 15/07: procedure sent	20th March 2015 20th March 2015 17/7/2015		closed and solved	Closed and Solved	INEO The antivirus was provided and sent the link to download it the 16th of July
P3SGAS05023	CLOSED	P	3	Paraguay	SGAS	Asuncion	3	El breaker Q5 presenta un falso contacto por lo que deberá ser cambiado	5 February 2015	INEO have contacted his local subcontractor to perform the modification			26 February 2015	2/26/2015	closed	OK Solved	OK

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Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P2SGAS05024	ON PROGRESS	P	2	Paraguay	SGAS	Asuncion	4	No se configuro la línea Administrativa IP	5 February 2015			27/02/2015 => As per SDD, this request seems to be out of scope of INEO 06/03/2015 A coordination email was sent to Paraguay for configuration changes in the Cisco. We are pending to that information to keep working on this issue and make tests with Paraguay. 12/03/2015: no news from Paraguay 16/03: configuration sent, pending tests 27/03: test resulted not succesful, but SIP proxy must be the VCS, not the Cisco 10/04: expert contracted and made Cisco configuration changes, and IPBX little changes. Specific test and config changes must be achieved by Paraguayan staff. 20/04: pending new info 22/05/2015: pending new info 15/07: pending new info regarding test achieved by Asuncion staff 21/09: test results pending	4th-March-2015 20th-March-2015 4th-April-2015 24th-April-2015 31/07/2015		pending	Not solved still pending Noted new date 24th April	INEO ICAO: The configuration of administrative line is INEO responsibility  INEO: the problem is the interconnection with the local system.
P3SGAS05025	closed	P	3	Paraguay	SGAS	Asuncion	5	La grafica de representación de los equipos en los nodos en el NMS no ha sido mejorada, tal como se había observado en la FAT	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	1- Problem identified 2- Implementation of the solution in progress 07/03/2015 -> new NMS version approved by ICAO 11/03/2015 -> new version of NMS implemented in production 22/05/2015: graphical representation of IBUC position to be deployed. 15/07: modification achieved	10th-March-2015 20th-March-2015 30th-March-2015 04th-April-2015 15/07/2015		solved and closed	OK Closed and Solved	INEO NMS aspect is for all sites and includes IBUC & LNB position state as per email of 12/03) Pending all other sites
P3SGAS05026	CLOSED	P	3	Paraguay	SGAS	Asuncion	6	Al realizar la prueba de redundancia del Capítulo 7 Pag. 70-125 de la PSAT, las IBUCs no indican las fallas y no conmutan automáticamente	5 February 2015	After analysis, it appears that the IBUC needs to be updated. To do so, we need to be connected directly to the equipment. INEO requests to ICAO the support from the local FP in order to perform this action.		25/02/2015 -> Solved by INEO (Closed as per INEO)	28 February 2015	2/28/2015	closed	OK	
P3SGAS05027	closed	P	3	Paraguay	SGAS	Asuncion	7	El puerto serial 0/0/0 del router GBB presenta una falla en donde pierde paquetes en Recepción, por lo cual la tarjeta 2-Port Async/Sync Serial WAN Interface Card debe ser reemplazada	5 February 2015	Analysis undergoinng -> An RMA will be opened if necessary	waiting for a clear diagnostic from SGAS that it is a hardware problem	17/03: update asked to FP 20/04: update asked 30/04: pending test (see email 22/04) 22/05: idem 15/07: closed as per succesful configuration implementation 21/09/15: All BER tests done now	10th-March-2015 20th-March-2015 30th-March-2015 04th-April-2015 15/07/2015		pending	Still pending the BER test. Noted the new date 24th April	INEO
P4SGAS05028	closed	P	4	Paraguay	SGAS	Asuncion	8	Pendiente actualización de los diagramas circuitales	5 February 2015	As-built under realization		Closing date includes finalization of drawings for ALL sites 27/03: documents achieved, to be shipped on Monday 30th March 2015 Prod of delivery to the end user at your disposal 22/05/2015: observations received from Manaus up to the the 22th of May will be corrected. 15/07: As built delivered	10th-March-2015 20th-March-2015 30th-March-2015 04th-April-2015 17/7/2015		solved and closed	CLOSED Documents and CD received with modification in the circuit diagrams P	ICAO Solved and closed

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P2SGAS05029	closed	P	2	Paraguay	SGAS	Asuncion	9	Perdida de paquetes en la red terrestre LEVEL 3 con Bolivia, Recife (Muy alta), Colombia, French Guyana, Guyana y Uruguay	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)		25/02/2015 => New request retransmitted to Level 3 06/03/2015 => individual tests to be performed 27/03/2015 => tests conducted by LE were successful, except French Guyana. Procedure sent on 27th of March for individual tests. 22/05/2015, pending test result (22/05/2015) 15/07: General state is ok, pending one issue with AMHS with Paraguay.	20th March 2015 20th March 2015 20th March 2015 17/7/2015	LEVEL 3	solved and closed	OK closed and solved	ICAO/LEVEL 3 LEVEL 3/INEO
O3SGAS110210	CLOSED	O	1	Paraguay	SGAS	Asuncion	10	Communication problems which forced Paraguay to pass services through the Level 3 network (email OACI 11/02)	11 February 2015	1/ Remote analysis of the problem 2/ Expert from INEO to be send on site to point again the antenna	problem Identified as a bad alignment of the antenna. On site technician for 23/02	25/02/2015 => Solved after intervention of INEO expert on site (Closed as per INEO)	20th March 2015 25th February 2015	2/25/2015	closed	OK	
P1SPIM05021	CLOSED	P	1	Peru	SPIM	Lima	1	Circuito AFTN con Manaus y Santiago Inoperativos	5 February 2015	Remote Diagnostic under progress	Resolution pending of the item P2SBMN02051	27/11/15 => Procedure for BER test targetted Marsh 02th => expected coordination from ICAO-Lima and PP to proceed 06/03/15 => waiting for a new diagnostic after Lima analysis 12/03/2015 => AFTN test conducted between SAEZ and SUMU and then will be spread 27/03: new tested to be conducted at SUMU and SAEZ. In addition to that, hardware was bought by INEO to perform tests at INEO facility. 10/04/2015 => INEO engineer sent at Guayaquil for network-wide test. 27/05: Lab test on-going, local BER tests resulted with initialization issue and latency but regular BER is ok. Further progress expected next week. 15/07: closed as per tests conducted on June	20th March 2015 20th March 2015 20th March 2015 17/7/2015		solved and closed	OK Closed and Solved	INEO
P2SPIM05022	CLOSED	P	2	Peru	SPIM	Lima	2	MODEM 1070 cadena A no operativo	5 February 2015	1/ Spare part installed 2/ Faulty equipment to be collected by INEO for reparation & replacement (Waiting for ICAO instructions) 3/ Spare Modem to be declared in the network		25/02/2015 Solved by INEO => Closed as per INEO	20th March 2015 24th February 2015	2/24/2015	closed	OK	
P4SPIM05023	closed	P	4	Peru	SPIM	Lima	3	La grafica de representación de los equipos en los nodos en el NMS no ha sido mejorada, tal como se había observado en la FAT	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	05/03/15 => Problem identified => Implementation of the solution in progress 12/03/2015 => new NMS aspect approved by OACI JL Aljeos email of 12/03), to be deployed in all site 22/05/2015: graphical representation of IBUC position to be deployed. 15/07: graphical aspect changed	20th March 2015 20th March 2015 20th March 2015 17/7/2015		solved but not closed	Not closed. NMS aspect is not completed yet. No indication about which position (A or B) for IBUs and LNBS	INEO NMS aspect is for all sites and includes IBUC & LNB position state as per email of 12/03) Pending all other sites

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P3SPIM05024	closed	P	3	Peru	SPIM	Lima	4	Falla actualización de los diagramas circuitales	5 February 2015	As-built under realization		Closing date includes finalization of drawings for ALL sites 27/03: documents achieved, to be shipped on Monday 30th March 2015 Proof of delivery to the end user at your disposal 22/05/2015: observations received from Manaus up to the 22th of May will be corrected. 15/07: As built delivered	2015-March-2015 2015-March-2015 2015-March-2015 17/7/2015		Solved and closed	CLOSED Documents and CD received with modification in the circuit diagrams P	ICAO Solved and closed	
P2SPIM05025	closed	P	2	Peru	SPIM	Lima	5	Pérdida de paquetes red terrestre Level 3 con Argentina, Maraca, Colombia, Guyana y Venezuela	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)		25/02/2015 => New request retransmitted to Level 3 06/03/2015 => individual tests to be performed 27/03/2015 => tests conducted by LE were successful, except French Guiana. Procedure sent on 27th of March for individual tests. 22/05/2015: pending test result (22/05/2015) 15/07: no failure reported so far	2015-March-2015 2015-March-2015 2015-March-2015 17/7/2015	LEVEL 3	closed and solved	OK Closed and Solved	LEVEL 3 INEO and ICAO	
P2SPIM05026	closed	P	2	Peru	SPIM	Lima	6	Numero ATS d no corresponde	5 February 2015	Local intervention of our expert		27/02/2015 => Targetted 02/03/2015 20/4/2015 => no detalle numero ATS-D configurado en la REDDIG II en Lima. Así debe ser el numero que manda la PBX, que no corresponde. Necesitamos mas detalles. 15/07: issue corrected by Ecuador	2015-March-2015 2015-March-2015 2015-March-2015 17/7/2015		Solved and Closed	Solved and Closed	INEO	
P4SPIM05027	CLOSED	P	4	Peru	SPIM	Lima	7	Pruebas cadena A satelital no realizadas por falla del MODEM cadena A	5 February 2015			25/02/2015 Solved by INEO => Closed as per INEO	24th February 2015		closed	OK	OK	
P4SPIM05028	closed	P	4	Peru	SPIM	Lima	8	Prueba BER no realizada	5 February 2015			During the PSAT, it appears that this test was not the priority. Now, it's difficult to perform it because it means that States will have to cut the services. If requested by ICAO, it could be done during the ORD period with the local FP and INEO coordination	27/02/2015 -> INEO (currently not working) has been contacted on 26/03/15 09/03/15 => As requested by ICAO (09/03/15) the test has already been performed in the satellite network (test no coordination required) 23/03/2015: procedure sent, pending on test to be coordinated by ICAO 09/04: new procedure sent with calendar preparation 1/05/15 22/05: finalization should be on Fr 22th of May	2015-March-2015 2015-March-2015 2015-March-2015 25th April 2015 1/05/2015 25/05/2015		pending	No completed pending issues	INEO After the first trials the BER SAT LOOP test was not positive it is required action to obtain the right BER value
P4SPIM05029	CLOSED	P	4	Peru	SPIM	Lima	9	Pendiente pruebas fallas de equipos (Sección 7.3)	5 February 2015			During the PSAT, it appears that this test was already performed. It could be easily checked, and upon request by ICAO, it could be done during the ORD period with the local FP and INEO remote coordination.		25th February 2015		closed	OK	

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P3SPIM050210	closed	P	3	Peru	SPIM	Lima	10	Errores plan de disco circuitos administrativos	5 February 2015	Local intervention of our expert		27/02/2015 => Targetted 02/03/2015 06/03/2015 => New configuration was sent to CORPAC on March 06th, pending to be implemented and tested. 12/03/2015 => configuration sent, first test ok. Pending confirmation 19/03/2015 => new test asked to confirm diagnose 27/03/2015 => closed as per email of 19/03 22/05/2015: configuration changed, pending update from CORPAC 15/07: no issue present in SPIM	2016-March-2015 2016-March-2015 2016-March-2015 17/7/2015		Closed and Solved	Closed and Solved	INEO
P3SPIM050211	closed	P	3	Peru	SPIM	Lima	11	Calidad voz IP teleconferencia no satisfactoria	5 February 2015	1/ Diagnostic of the current configuration 2/ New configuration to be proposed after analysis 3/ Configuration implemented, to be tested (12/03)		05/03/2015 => diagnostic still on progress 13/03/2015 => modem configuration changed, test pending 27/03/2015 => tests achieved with Manaus, unsuccessful 30/04/2015: Pending test with new firmware 22/05/2015: new firmware not succesful, Pending configuration change and tests. 15/07: quality ok as per June tests	2016-March-2015 2016-March-2015 2016-March-2015 17/7/2015		Quality of voice ok but not the IP telephone system	Quality of voice ok but not the IP telephone system	INEO
O2SPIM120212	closed	O	2	Peru	SPIM	Lima	12	anomalía que está presentándose en la comunicación AFTN de Santiago hacia Lima y Ezeiza (email OACI 12/02)	12 February 2015	OSPF Pb under analysis -> Looking for a technical solution to be implemented	Resolution pending of the item P2SBMN02051	27/11/15 => Procedure for BER test targetted Marsh 02th => expected coordination from ICAO-Lima and FP to proceed 06/03/15 => waiting for a new diagnostic after Lima analysis 12/03/2015 => AFTN test conducted between SAEZ and SUMU and then will be spread 27/03: new tested to be conducted at SUMU and SAEZ. In addition to that, hardware was bought by INEO to perform tests at INEO facility 10/04/2015 => INEO engineer sent at Guayaquil for network-wide test. 27/05: Lab test on-going, local BER tests resulted with initialization issue and latency but regular BER is ok. Further progress expected next week. 15/07: AFTN ok	2016-March-2015 2016-March-2015 2016-March-2015 17/7/2015		Solved and Closed	Solved and Closed	INEO
P3SMPM05021	closed	P	3	Suriname	SMPM	Paramaribo	1	Presenta perdidas de paquetes en la red terrestre LEVEL 3 con Argentina, Manaus Recife (muy alta), Chile, Colombia, Ecuador, Guyana y Uruguay	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)		25/02/2015 => New request retransmitted to Level 3 06/03/2015 => individual tests to be performed 27/03/2015 => tests conducted by LE were successful, except French Guiana. Procedure sent on 27th of March for individual tests. 22/05/2015: pending test result (22/05/2015) 15/07: no failure reported so far	2016-March-2015 2016-March-2015 2016-March-2015 17/7/2015	LEVEL 3	solved and closed	solved and closed	LEVEL 3 INEO and ICAO

File update: 21/2016 16:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P4SMPM05022	closed	P	4	Suriname	SMPM	Paramaribo	2	Pendiente pruebas BER	5 February 2015			27/02/2015 => INEO technicians will conduct the tests on site on 27/02/15 28/02/15 => IP added during teleconference. Further requires to shutdown the whole satellite network need to confirm and coordinate 12/03/2015: procedure still pending on site to be performed by ICAO 15/03/2015: procedure start with calendar released by ICAO 22/05: finalization should be on Fr 22th of May	2016-March-2015 2016-March-2015 2016-March-2015 17/7/2015		solved and closed	solved and closed	INEO
P3SMPM05023	closed	P	3	Suriname	SMPM	Paramaribo	3	Teleconferencia IP solo con diez usuarios	5 February 2015	1/ Diagnostic of the current licence 2/ New 16 users licences to be provided after analysis		05/03/2015 => Hardware limitation found solution to be provided. Will be coded change of hardware addition 21/04/2015 => DSP implemented in Cisco SBMM & SAEZ 09/04: under procurement 21/09: test on laboratory is performed, new Cisco configuration will be provided	2016-March-2015 2016-March-2015 2016-March-2015		solved and closed	Solved and Closed	INEO
P3TTZP05021	closed	P	3	Trinidad & Tobago	TTZP	Piarco	1	NMS: refresco cambios de estados muy lento	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	05/03/2015 => All NMS systems are working correct (tested). For the status NMS it is not possible to improve it due to obsolete IP 09/04: information requested 22/03/2015: information asked to subcontractor for web browser configuration 15/07: proposed browser Opera and Chrome appears faster, pending feedback	2016-March-2015 2016-March-2015 2016-March-2015 17/7/2015	3/6/2015	solved and closed	Solved and Closed	INEO
P4TTZP05022	closed	P	4	Trinidad & Tobago	TTZP	Piarco	2	Calidad de la imagen no mejorada aspecto pendiente desde la FAT	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	05/03/15 => Problem identified => Implementation of the solution in progress 12/03/2015 => new NMS aspect approved by OACI (L. Algunos email of 12/03), to be deployed in all site 22/05/2015: graphical representation of IBUC position to be deployed. 15/07: graphical representation deployed	2016-March-2015 2016-March-2015 2016-March-2015 17/7/2015		solved but not closed	Not closed. NMS aspect is not completed yet. No indication about which position (A or B) for IBUs and LNBs	INEO MS aspect is for all sites and includes IBUC & LNB position state as per email of 12/03) Pending all other sites
P3TTZP05023	closed	P	3	Trinidad & Tobago	TTZP	Piarco	3	Teleconferencia IP solamente trabaja con 11 usuarios no cumple con las especificaciones técnicas de la REDDIG	5 February 2015	1/ Diagnostic of the current licence 2/ New 16 users licences to be provided after analysis		05/03/2015 => Hardware limitation found, solution to be provided. Will be coded change of hardware addition 21/04/2015 => DSP to be installed in Cisco SBMM & SAEZ 09/04: under procurement 15/07: new configuration to be implemented 21/09: test on laboratory is performed, new Cisco configuration will be provided	2016-March-2015 2016-March-2015 2016-March-2015 2016-March-2015 end of september		closed and solved	The IP teleconference met with the quality of voice and number of users(16)	INEO
P2TTZP05024	CLOSED	P	2	Trinidad & Tobago	TTZP	Piarco	4	No hay conmutación automática en el IBUC en caso de falla solamente conmuta cuando se apaga la energía	5 February 2015	After analysis, it appears that the IBUC needs to be updated. To do so, we need to be connected directly to the equipment. INEO requests to ICAO the support from the local FP in order to perform this action.		05/02/2015 => New IBUC firmware successfully installed => Switching problem solved in Trinidad by local INEO	28 February 2015	2/28/2015	closed	OK solved	ok

File update: 21/2016 16:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P2TTZP05025	closed	P	2	Trinidad & Tobago	TTZP	Piarco	5	Perdida de paquetes en la red terrestre LEVEL 3 con Curitiba y Ecuador.	5 February 2015	Information transmitted to level 3 -> Waiting for the solution proposed and the ECD (Expecting Closing Date)		25/02/2015 -> New request implemented to level 3 05/03/2015 -> Individual tests to be performed. 07/03/2015 -> Issue corrected by ISP (no response) however Trinita, Curacao, Providence and on 22th of March for individual tests. 09/03/2015, sending test results. 09/03/2015 15/07: no issue reported so far	24th March 2015 31/7/2015	LEVEL 3	closed and solved	OK Closed and Solved	LEVEL 3 INEO and ICAO
O2TTZP18026	CLOSED	O	2	Trinidad & Tobago	TTZP	Piarco	6	Communication problem with Paramaribo and Manaus according to the email from ICAO (18th Feb.)	18 February 2015	OSPF Pb under analysis -> Looking for a technical solution to be implemented	Resolution pending of the item P2SBMIN02051	25/02/2015 -> New configuration will be tested by ICAO (on 9/03/2015) with ICAO's own configuration (ready by 04/03/2015) 25/02/2015 -> New configuration implemented - solution involving code addition 25/02/2015 -> Improvement of the configuration 21/04/2015 => New Skywan firmware installed => System on monitoring	21st April 2015		closed	OK	
P4SUMU05021	CLOSED	P	4	Uruguay	SUMU	Montevideo	1	Falta actualización los planos con los diagramas circutales	5 February 2015	As-built under realization		Closing date includes finalization of drawings for ALL sites 27/03: documents achieved, to be shipped on Monday 30th March 2015 Proof of delivery to the end user at your disposal 22/05/2015: observations received from Manaus up to the the 22th of May will be corrected. 15/07: As built delivered	20th March 2015 17/7/2015		solved and closed	CLOSED Documents and CD received with modification in the circuit diagrams P	ICAO Solved and closed
P4SUMU05022	solved	P	4	Uruguay	SUMU	Montevideo	2	Unidad 1070 cadena B no enciende luz verde aun cuando opera bien	5 February 2015	The faulty unit must be replaced by a spare part coming from ICAO-Lima premises. A RMA number will be generated once the faulty unit is ready to be shipped.		06/03/2015 => shipment of faulty unit towards NDSatCom pending 16/07/2015 => Waiting for spare part available at ICAO-Lima premises (spare IDU 1070 available, but still under Peru customs since 23/09/2015) 09/09/15: spare part available at ICAO office, waiting for ICAO shipment			pending	No action made solution required	ICAO A Modem from REDDIG II Lima spare part place will be sent to Montevideo
P3SUMU05023	CLOSED	P	3	Uruguay	SUMU	Montevideo	3	Falta cambiar Feed Horn	5 February 2015			24 March 2015	3/24/2015	closed	OK Closed		
P3SUMU05024	closed	P	3	Uruguay	SUMU	Montevideo	4	NMS: refresco cambios de estados muy lento	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	15/03/2015 -> in local NMS systems, console refresh. For the system NMS it is not possible to improve it due to obsolete HW. 09/04: information requested 20/05/2015: information asked to the manufacturer for HW refresh 09/09/15: information requested 15/07: proposed browser Opera and Chrome appears faster, pending feedback	20th March 2015 17/7/2015	3/6/2015	solved and closed	Solved and Closed	INEO

File update: 21/2016 18:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P4SUMU05025	closed	P	4	Uruguay	SUMU	Montevideo	5	Calidad de la imagen no mejorada aspecto pendiente desde la FAT	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	02/02/15 → Problem identified → Implementation of the solution in progress 02/02/2015 → new NMS version approved by OACI. U. Maps sent at 02/03/15 to be deployed in all the REDDIG-2015. Approved implementation of BER version implemented. 15/07: changed	20th-March-2015 24th-March-2015 20th-April-2015 17/7/2015		solved but not closed	Not closed. NMS aspect is not completed yet. No indication about which position (A or B) for IBUs and LNBs Noted new date 24th April	INEO MS aspect is for all sites and includes IBUC & LNB position state as per email of 12/03/ Pending all other sites
P3SUMU05026	closed	P	3	Uruguay	SUMU	Montevideo	6	Falta instalar antivirus en el NMS	5 February 2015	To be provided by INEO		27/03/2015: Antivirus already installed and operating system 02/04/2015: procedure in progress 02/04/2015: procedure completed. Pending procedure to be sent 15/07: procedure and FTP link sent	20th-March-2015 24th-March-2015 20th-April-2015 17/7/2015		closed and solved	Closed and Solved	INEO
P3SUMU05027	closed	P	3	Uruguay	SUMU	Montevideo	7	El NMS presenta información incorrecta	5 February 2015	1/ Diagnostic of the current configuration of the NMS 2/ New version of the NMS	NMS works in progress	02/02/15 → Problem identified → Implementation of the solution in progress 02/02/2015 → new NMS version approved by OACI. U. Maps sent at 02/03/15 to be deployed in all the REDDIG-2015. Approved implementation of BER version implemented. 15/07: graphical aspect changed. Pending new info	20th-March-2015 24th-March-2015 20th-April-2015 17/7/2015		closed and solved	Closed and Solved	INEO
P4SUMU05028	closed	P	4	Uruguay	SUMU	Montevideo	8	Pendiente pruebas BER	5 February 2015	During the PSAT, it appears that this test was not the priority. Now, it's difficult to perform it because it means that States will have to cut the services. If requested by ICAO, it could be done during the ORD period with the local FP and INEO coordination		21/02/2015: INEO request to start PSAT in the first week of 2015/15 as we will be during the ORD period. The test requires to shutdown the whole satellite network. Need to confirm and coordinate it. 02/03/15: procedure sent, pending of test to be coordinated by ICAO 20/04/15: pending information with ICAO regarding procedure with external testing team (IBU) 20/05: procedure approved by ICAO 20th of May 15/07: tests shows a possible requirement of pointing checking, and possible interference	20th-March-2015 24th-March-2015 20th-April-2015 31/7/2015		pending	Pending BER Test.	INEO After the first trials the BER SAT LOOP test was not positive it is required action to obtain the right BER value
P4SUMU05029	solved	P	4	Uruguay	SUMU	Montevideo	9	La versión entregada de software para la VPN remota no es acorde al manual enviado para su instalación, no pudiendo instalarse según lo sugerido por INEO.	5 February 2015	An amendment to the User Manual will be sent to all the Reddig II Members by email.		17/03: new procedure sent, same as for SAEZ and SBMN 30/04: update requested, pending answer 22/05/2015: pending information, asked during conf call of 19/05 15/07: pending new info.	13th-March-2015 27th-March-2015 20th-April-2015 17/7/2015 15 sept		pending	Not solved. Configuration must to be done by INEO the week of 20th July	INEO VPN equipment has been configured. We request a simple IP internet address to permit the connection. With the current configuration the connection is not possible.

File update: 21/2016 18:18							REDDIG-II - Pending issues										
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Item #	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue
P3SUMU050210	closed	P	3	Uruguay	SUMU	Montevideo	10	Pérdidas de paquetes en la red terrestre LEVEL 3 con Bolivia, French Guyana, Surinam, Trinidad & Tobago y Venezuela.	5 February 2015	Information transmitted to level 3 → Waiting for the solution proposal and the ECD (Expediting Closing Date)		25/02/2015 → New router configuration is level 3 05/03/2015 → Individual tests were performed 27/03/2015 → Issue corrected by a IP address change from 192.168.1.1 to 192.168.1.254 05/04/2015 → pending test week (05/04/2015) 15/07: no issue reported so far	2015-02-05 2015-03-05 2015-04-05 2015-04-15 17/7/2015	LEVEL 3	closed and solved	Closed and Solved	LEVEL 3 INEO and ICAO
P1SUMU020511	closed	P	1	Uruguay	SUMU	Montevideo	11	Async circuit for radar data from SAEZ does not work since initial installation	5 February 2015			2015 configuration changed, pending test 27/03 implementation completed, pending test in 15/07, pending info 15/07: Configuration is the same as with AFTN, pending info	2015-02-05 2015-03-05 2015-03-27 17/7/2015		solved but in observation	Solved but in observation	INEO /ICAO Radar data of Argentina is now processed in the automation center of Montevideo
P2SVIM05021	CLOSED	P	2	Venezuela	SVIM	Maiquetia	1	No se observa el switcheo automatico en el RSS	5 February 2015	We have contacted our site manager, and apparently it was the automatic switching of the RSS from B to A. It's normal that it's doesn't work because it's only possible manually. Please confirm that it's issue can be SOLVED		25/02/2015 Solved by INEO => Closed as per INEO	18 February 2015	2/18/2015	closed	OK closed	
O1SVIM18022	CLOSED	O	1	Venezuela	SVIM	Maiquetia	2	Communication problem with Georgetown, Paramaribo, and Manaus according to email of the 18th Feb.	18 February 2015	OSPF Pb under analysis -> Looking for a technical solution to be implemented	Resolution pending of the item P2SBMN02051	25/02/2015 → New configuration will be ready by Wednesday 27/02/15, on all nodes after reconfiguration made by user 05/03/2015 → COE verified 27/02/2015 → New configuration implemented, solved monitoring system 2015-03-05 → Implementation completed 17/03/2015 → test added to PT 27/03/2015 → no issue reported so far 21/04/2015 => New Skywan firmware installed => System on monitoring	2015-02-25 2015-03-05 2015-03-27 2015-04-21 21st April 2015		closed	OK System on monitoring	ok
O1SVIM25023	CLOSED	O	1	Venezuela	SVIM	Maiquetia	3	All the AFTN communication out of service	24 February 2015	Problem occurred due to other equipment		25/02/2015 → change implemented, OSPF configuration rechecked on both sites on 15/03/2015 27/02/2015 → solved 21/04/2015 => New Skywan firmware installed => System on monitoring	2015-02-25 2015-03-27 21st April 2015		closed	OK Closing date	ok
#GBB_tests	CLOSED	O		Multiple sites	Multiple sites	Multiple sites	1	Issues experimented in GBB dedicated communication	4/2/2015	Individual configuration checks and tests.		2015 configuration changed, resolved all issues 15/07: v14 has this issue checked, pending tests and possible correction.	2015-02-04 2015-03-05 2015-03-27 17/7/2015		CLOSED	OK closed final test was made December 2015	ok
	ON PROGRESS					Multiples sites	1	Freezing of MODEM	February 2015	Is under ND SATCOM		21/09: no more issue observed since deployment of new NDSatcom software and last configuration change in Recife. Date of observation: 15/09 Could we consider the problem closed by the end of september?	31th July end of september		P ending	INEO presented an action plan to solve the freezing that will be completed by the end of 2016	INEO (NDSatcom)

File update: 21/2016 18:18							REDDIG-II - Pending issues										Item #	Item #
Item	STATUS (as per INEO)	TYPE O/M	CRITI CITY	Country	Node	City	Outstanding issues	Opening date	Action(s) to be performed	COMMENTS	Current update	Expecting closing date	Real closing date	STATUS (as per ICAO)	ICAO STATES Commentaries	INEO / ICAO Responsible to solve the pending issue		
<b>Legend of colours</b>																		
Legend colour	PENDING	The line remains uncolored since the status of the issue is still pending											Status (as per ICAO)	Customer initial color				
Legend colour	ON PROGRESS	The colour of this line is automatically updated according the status, except the last column which always remains as initially colored by the customer.											pending	8	Customer initial color			
Legend colour	SOLVED	The colour of this line is automatically updated according the status, except the last column which always remains as initially colored by the customer.											solved but not closed	5	Customer initial color			
Legend colour	Solution identified	The colour of this line is automatically updated according the status, except the last column which always remains as initially colored by the customer.											closed	33	Customer initial color			
Legend colour	CLOSED	The colour of this line is automatically updated according the status, except the last column which always remains as initially colored by the customer.											TOTAL	46	Customer initial color			

Example

Item	STATUS	TYPE P/M	CRITICITY	Country	Node	City	Item #	Outstanding issues	Opening date
<b>P 1 SAEZ 02 05 11</b>	PENDING	<b>P</b>	<b>1</b>	Argentina	<b>SAEZ</b>	Ezeiza	<b>11</b>		<b>05 / 02 / 2015</b>
Type Criticity Node Month Day Item #									

**M** will be for Maintenance problem with the following Gradation

- 1 Critical
- 2 Urgent
- 3 Non-critical
- 4 Minor

**P** will be for PSAT observation with the following Gradation

- 1 Critical
- 2 Urgent
- 3 Non-critical
- 4 Minor



## APPENDIX E / APENDICE E

**Amendment III to Contract 22501200 for the Provision of a New Regional Aeronautical Telecommunication Network (REDDIG II) and associated equipment and services for the REDDIG II Member States.**

Contract 22501200 for the Provision of a New Regional Aeronautical Telecommunication Network (REDDIG II) and associated equipment and services for the REDDIG II Member States (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Trinidad & Tobago, Uruguay and Venezuela) is hereby amended to add one (1) node in Brasilia (Brazil), to increase the price of the Contract and to extend the implementation schedule accordingly.

This Amendment III shall form part of ICAO Contract 22501200 between the International Civil Aviation Organization (ICAO) acting on behalf of and as mandatary for the REDDIG II Member States, and the Consortium consisting of INEO Engineering and Systems and LEVEL 3 PERÚ S.A. and shall become effective on the date of signature of this document by ICAO, INEO Engineering and Systems and LEVEL 3 PERÚ S.A.

All articles of Contract 22501200 not covered in this Amendment III or previous Amendments I and II shall remain unchanged and in force.

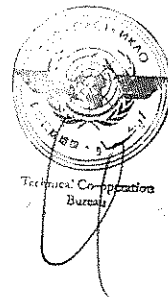
*Articles nos. 7.2.4, 8.4, 13.9 through 13.14 are added and Articles nos. 2.2, 2.3, 2.4, 5.1.1, 5.2.1, 5.2.2, 6.3, 6.5, 9.1, 11.3, 11.13 and 16.3 are hereby amended and shall become:*

~2.2 This project covers equipment and Services for the Network required for the seventeen (17) + one (1) sites as further specified below:

**Sites (countries):**

Ezeiza (Argentina)  
La Paz (Bolivia)  
Manaus (Brazil)  
Recife (Brazil)  
Curitiba (Brazil)  
Brasilia (Brazil)  
Santiago (Chile)  
Bogotá (Colombia)  
Guayaquil (Ecuador)  
Georgetown (Guyana)  
Cayenne (French Guiana)  
Asunción (Paraguay)  
Lima (Peru)  
Paramaribo (Suriname)  
Piarco (Trinidad and Tobago)  
Montevideo (Uruguay)  
Maiquetía (Venezuela)

Honduras (Tegucigalpa), as per Attachment I, Technical Specifications Compliance Document from INEO E&S, Section C, 2.1.2 and 2.2.7"



2.3 A six (6)-month leasing of related ground communication services is included in the Contract [except for the node of Brasilia (Brazil)] and will be provided by Level 3 under the Contractor's responsibility [starting after successful Final Network Acceptance Tests (date of signed FNAT certificate)], as per Attachment I and XI. Such services may be invoiced directly from Level 3."

2.4 The Contract shall be implemented in three phases:

- Phase I: provision of the System Design Document (SDD) as defined in Article 7.2 and approval of the SDD;
- Phase II: provision of the Network and related Services;
- Phase III: provision of the node of Brasilia (Brazil)."

5.1.1 The total price of Phases I, II and III of this Contract as defined in Article 2.4 is US \$4,678,797.29 (four million, six hundred and seventy-eight thousand, seven hundred and ninety-seven United States dollars and twenty-nine cents), broken down as follows:

i-	Total price of Phase I:	US \$285,455.00
ii-	Total Price of Phase II:	US \$4,056,672.98
	Consisting of:	
	Original price of Phase II:	US \$3,943,398.98
	Addition to Phase II, subject of Amendment I:	US \$84,798.00
	Reduction to Phase II, subject of Amendment I:	-US \$3,840.00
	Addition to Phase II, subject of Amendment II:	US \$32,316.00
iii-	Total Price of Phase III, subject of Amendment III:	US \$336,669.31"

5.2.1 All invoices shall be issued to ICAO Finance Branch for payment in accordance with the payment schedule as indicated below:

Ref.	Payment Term for Phase I
1	US \$114,182 representing 40% of the price of Phase I as down payment with acceptable Bank Guarantee (as per invoice 8500006629)
2	US \$171,273 representing 60% of the price of Phase I upon approval of the SDD (as per invoice 8500007772)
Ref.	Payment Term for Phase II
3	US \$1,136,477.09 as down payment with acceptable Bank Guarantee (as per invoices 8500007773 and 8500008502)
4	a) US \$1,337,200.54 representing 35% of the price of Phase II, excluding the leasing of ground communication services (Table 1 of Attachment II); and b) US \$9,694.80 representing 30% of the addition to Phase II, subject of Amendment II (both payments as per invoice ESF1214003) upon the last shipment of equipment and acceptable Bank Guarantee
5	US \$382,057.30 representing 10% of the price of Phase II, excluding the leasing of ground communication services (Table 1 of Attachment II) (as per invoice ESF0914004), upon completion of theoretical-practical training
6	a) US \$573,085.95 representing 15% of the price of Phase II, excluding the leasing of ground communication services (Table 1 of Attachment II) (as per invoice ESF0315001); and

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*[Handwritten signature]*

*[Handwritten signature]*



	b) US \$118,050 representing 50% of Table I of Attachment II upon satisfactory Provisional Site Acceptance Test (PSAT)
7	US \$382,057.30 representing 10% of the price of Phase II, excluding the leasing of ground communication services (Table I of Attachment II), upon satisfactory Final Network Acceptance Test (FNAT) and Acceptable Performance Bond
8	US \$118,050 representing 50% of Table I of Attachment II three months after satisfactory Final Network Acceptance Test (FNAT)
Ref.	<b>Payment Term for Phase III</b>
9	US \$134,467.72 representing 40% of the price of Phase III (excluding US \$500 for installation of equipment for ground communication services), as down payment with acceptable Bank Guarantee
10	a) US \$201,701.59 representing 60% of the price of Phase III (excluding US \$500 for installation of equipment for ground communication services), and b) US \$500 for installation of equipment for ground communication services upon satisfactory Site Acceptance Test (SAT)

5.2.2 Correct invoices shall be accepted by ICAO for the above payments provided they are accompanied or preceded by the documents as set forth in Articles 5.2.2.1 to 5.2.2.10, using the table references as indicated under Article 5.2.1.

**5.2.2.1 Down Payment on placement of order for Phase I against invoice 8500006629 and submission of an acceptable Bank Guarantee:**

The Contractor shall submit:

- i. One (1) original invoice 8500006629 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 1;
- ii. Acceptable Bank Guarantee, as per Article 6.1.

**5.2.2.2 Progress Payment against invoice 8500007772 upon approval of the System Design Document (SDD):**

The Contractor shall submit:

- i. One (1) original invoice 8500007772 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 2;
- ii. Written confirmation of approval of the SDD from the REDDIG II PROJECT GROUP.

**5.2.2.3 Down Payment on placement of order for Phase II against invoices 8500007773 and 8500008502 and submission of an acceptable Bank Guarantee**

The Contractor shall submit:

- i. One (1) original invoice 8500007773 and 8500008502 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 3;
- ii. Acceptable Bank Guarantee, as per Article 6.2.

**5.2.2.4 Progress Payment at the last shipment of equipment against invoice ESF1214003 and submission of an acceptable Bank Guarantee:**

The Contractor shall submit:

- i. One (1) original invoice ESF1214003 plus one (1) copy covering the cumulative amount as per Article 5.2.1, Ref. 4a and 4b);
- ii. One (1) original Factory Acceptance Certificate duly signed as per Article 11.7;
- iii. Acceptable Bank Guarantee, as per Article 6.3.
- iv. Shipping documents and insurance certificate as per Article 9.9.

**5.2.2.5 Progress Payment at satisfactory completion of theoretical-practical training against invoice ESF0914004:**



- i. One (1) original invoice ESF0914004 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 5;
- ii. Written confirmation of satisfactory completion of theoretical-practical training from the REDDIG II PROJECT GROUP;

**5.2.2.6 Progress Payment at satisfactory Provisional Site Acceptance against invoice ESF0315001:**

The Contractor shall submit:

- i. One (1) original invoice ESF0315001 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 6a);
- ii. Sixteen (16) original Provisional Site Acceptance Certificates (one from each site) duly signed as per Article 13.1.

Level 3 shall submit:

- iii. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 6b);
- iv. A copy of the sixteen (16) Provisional Site Acceptance Certificates (one from each site) duly signed as per Article 13.1.

**5.2.2.7 Progress Payment at satisfactory Final Network Acceptance:**

The Contractor shall submit:

- i. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 7;
- ii. One (1) original Final Network Acceptance Certificate duly signed as per Article 13.6;
- iii. Acceptable Performance Bond as per Article 6.5.

**5.2.2.8 Final Payment three (3) months after satisfactory Final Network Acceptance:**

Level 3 shall submit:

- i. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 8;
- ii. One (1) original Certificate of satisfactory provision of the ground communication services (Attachment X) duly signed by REDDIG II PROJECT GROUP.

**5.2.2.9 Down Payment on signature of Amendment III for Phase III and submission of an acceptable Bank Guarantee:**

The Contractor shall submit:

- i. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 9;
- ii. Acceptable Bank Guarantee, as per Article 6.3.

**5.2.2.10 Progress Payment at satisfactory Site Acceptance of the Brasilia node:**

The Contractor shall submit:

- i. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 10a);
- ii. One (1) original Site Acceptance Certificate duly signed as per Article 13.13;
- iii. Acceptable Performance Bond as per Article 6.5;

The Contractor or Level 3 shall submit:

- iv. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 10b);
- v. One (1) original Site Acceptance Certificate duly signed as per Article 13.13."



"6.3 The progress payments of Phase II covering the cumulative amount shown in Article 5.2.1, Ref. 4a) and 4b), and the down payment of Phase III covering the amount shown in Article 5.2.1, Ref. 9, shall be secured by Bank Guarantees acceptable to ICAO as per the model under Attachment IV that shall be submitted to ICAO at the latest with the invoice for the progress payment. The guarantees shall remain valid and at its full value until final delivery of the equipment of the Network in the REDDIG II Member States customs."

"6.5 A Performance Bond in the form of a Bank Guarantee, as per the model under Attachment V, shall be provided by the Contractor to ICAO and shall remain in effect from the date of the FNAT Certificate for the full period of the warranty as detailed in Article 16. The amount of the performance bond shall be US \$370,729.90. A separate Performance Bond for the Brasilia node for an amount of US \$33,666.93 shall be provided by the Contractor to ICAO and shall remain in effect from the date of the SAT Certificate for the Brasilia node for the full period of the warranty of the Brasilia node as detailed in Article 16."

"7.2.4 The Contractor shall provide, within five (5) weeks of the signature of Amendment III, for the REDDIG II PROJECT GROUP evaluation and approval, the revised SDD with the technical specification for the Brasilia node and revised configuration information and software management information impacting all other nodes. Together with the revised SDD the Contractor shall submit for the REDDIG II PROJECT GROUP's review and approval, copied to ICAO for information purposes, a detailed Implementation Schedule, the Factory Acceptance Test Procedures and the Site Acceptance Test Procedures for the Brasilia node. The review and approval times of Article 7.2.2 shall apply *mutatis mutandis* to the revised SDD with the technical specification for the Brasilia node."

"8.4 The meetings as per Article 8.1 through 8.3 shall apply *mutatis mutandis* for the node of Brasilia (Brazil) subject of Amendment III. The Kick Off Meeting for the node of Brasilia (Brazil) shall be held within two (2) weeks of signature of Amendment III and may be held remotely via teleconference."

"9.1 Delivery, installation and commissioning shall take place in accordance with the Contract Implementation Schedule in Attachment IX. The Contract Implementation shall not exceed **fifteen and a half (15.5)** months from the Commencement Date, excluding the Brasilia node. Delivery, installation and commissioning of the Brasilia node shall not exceed **seven (7)** months from the date of signature of Amendment III to the Contract."

"11.3 The Contractor shall arrange for one (1) FAT session, to run consecutively for the Network equipment and not fragmented sessions. The Contractor shall arrange one (1) separate FAT session for the Brasilia node."

"11.13 The Contractor shall allow the participation of six (6) personnel (four (4) from the REDDIG II Member States and two (2) from the REDDIG II PROJECT GROUP) for the Factory Acceptance Tests and shall provide air travel (economy class) from and to the respective REDDIG II Member State, terminal transportation (airport to hotel and return), medical travel insurance and DSA costs (US \$358 /day /person) for the REDDIG II PROJECT GROUP's and REDDIG II Member States' Personnel. Additionally, for the



Brasilia node the Contractor shall allow the participation of two (2) personnel (one (1) from Brazil and one (1) from the REDDIG II PROJECT GROUP) for the Factory Acceptance Test and shall provide, for these two (2) personnel, air travel (economy class) from and to respective REDDIG II Member State, terminal transportation (airport to hotel and return), medical travel insurance and DSA costs (US \$358 /day /person)."

13.9 Regarding the Site Acceptance of the node of Brasilia (Brazil), the SAT Testing and Procedures shall consist of verification of the site installation and its integration in the Network (satellite and ground), all Network performance and technical functional characteristics under this Contract in a true operational environment. The SAT must also verify that all the equipment under this Amendment III, including spare parts, has been delivered and that all Documentation, Drawings, As-Built Plans, etc., have been completed and delivered.

13.10 The Contractor shall submit for REDDIG II PROJECT GROUP's review and approval together with the SDD for the node of Brasilia (Brazil), copied to ICAO, the proposed Site Acceptance Test Procedures. The REDDIG II PROJECT GROUP shall notify the Contractor of its comments and decision within the same time frames as defined for the SDD in Article 7.2.2. The Contractor shall modify the SAT procedures accordingly and shall resubmit the procedures together with the SDD.

13.11 If the system or sub-system fails to pass one or more of the tests, i.e. the test(s) shows that the system is non-compliant with the requirements of the specifications, then the Contractor shall correct the cause of the failure(s). The REDDIG II PROJECT GROUP reserves the right to have all the tests or any single test performed again, on the Network and/or the node of Brasilia (Brazil) under this Contract. All such costs shall be borne by the Contractor, including travel and subsistence costs (covering accommodation, meals and local transportation) for the REDDIG II PROJECT GROUP's representative(s) re-participation.

13.12 Notwithstanding any other rights of, or remedies available to ICAO/ the REDDIG II PROJECT GROUP under the Contract, in case the Network and/or the node of Brasilia (Brazil) remain defective or otherwise do not conform to the specifications or other requirements of the Contract after the SAT, ICAO/the REDDIG II PROJECT GROUP, at its sole option, may reject or refuse to accept the node of Brasilia (Brazil), and within thirty (30) days following receipt of notice from ICAO of such rejection or refusal to accept the node of Brasilia (Brazil), the Contractor shall, in sole option of ICAO/ REDDIG II PROJECT GROUP:

- i) repair the node of Brasilia (Brazil) in a manner that would enable the node of Brasilia (Brazil) to conform to the specifications or other requirements of the Contract; *or*,
- ii) replace the node of Brasilia (Brazil) with equipment of equal or better quality; *and*,
- iii) pay all costs relating to the repair or return of the defective equipment as well as the costs relating to the storage of any such defective equipment and for the delivery of any replacement equipment to Brasilia (Brazil).

13.13 The Site Acceptance Certificate (Attachment VI) will be signed immediately upon meeting satisfactory completion of the following conditions:

- i. Successful SAT;
- ii. All Training Programs have been satisfactorily completed:



- iii. All Documentation, Drawings, As-Built, Plans, etc., have been completed and delivered;
- iv. All Spare Parts supplied under this Amendment III have been verified in an operational manner and proved to operate correctly.

13.14 Minor defects that do not affect the operation and service of the Network, shall not permit the REDDIG II PROJECT GROUP/ the REDDIG II Member States to refuse to sign the on-Site Acceptance Certificate(s) and the Contractor shall undertake to resolve those defects at their own expense and in an agreed time frame.”

“16.3 The Contractor's warranty shall remain in effect for a period of twenty-four (24) months from the final commissioning date of the Network (signed Final Network Acceptance Certificate) and with respect to the node of Brasilia (Brazil) for a period of twenty-four (24) months from the final commissioning date of Phase III (signed Site Acceptance Certificate), but in no case later than thirty-six (36) months from the FAT of the equipment of the Network if the Final Network Acceptance/ Site Acceptance of the node in Brasilia (Brazil) is delayed for reasons beyond the Contractor’s control, provided that with respect to a major failure of the Network, the consequence of which being that the Network cannot be operationally available, the original period of warranty shall be extended for a warranty period equivalent to the time required for necessary repair.

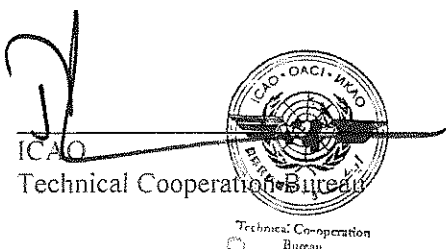
*Note:* The warranty period shall begin anew for any part of the Network replaced or repaired pursuant to this article, however be valid no longer than thirty-six (36) months from the FNAT (date of signed FNAT-certificate) and with respect to the node of Brasilia (Brazil) be valid no longer than thirty-six (36) months from the SAT of Phase III (signed Site Acceptance Certificate).”

*Attachment II - Scope of Supply and Pricing is hereby amended to revise the scope of supply and to increase the price of the Contract accordingly.*

*Attachment VI - Model Provisional Site/Final Network Acceptance Test Certificate is hereby amended to add the SAT Certificate for the node in Brasilia (Brazil).*

*Attachment IX – Implementation schedule is hereby amended to add the commissioning of the node in Brasilia (Brazil).*

Signed on 3 August 2015. on behalf of:  
Date



**Jacques-Olivier KLOTZ**

Aeronautical Export  
Department Director 24/07/2015  
INEO Engineering and Systems

*[Handwritten mark]*

*[Signature]*  
LEVEL 3 PERÚ S.A.

*[Signature]*  
OSWALDO CLAROS UGALDE  
REPRESENTANTE LEGAL  
LEVEL 3 PERÚ S.A.

GIANNI HANAWA MAKABE  
REPRESENTANTE LEGAL  
LEVEL 3 PERÚ S.A.

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**“Revised Attachment II  
Scope of Supply and Pricing  
All prices in USD**

Description	Qty	Total
<b>Phase I - provision of SDD, which includes:</b>		
SDD - NMS	Lot	\$56,078.00
FAT Protocols - NMS	Lot	\$8,084.00
SAT Protocols - NMS	Lot	\$8,084.00
Installation Procedures - NMS	Lot	\$32,322.00
Training Documentation - NMS	Lot	\$14,860.00
SDD – VSAT and ground network	Lot	\$79,205.00
FAT Protocols - VSAT and ground network	Lot	\$14,266.00
SAT Protocols - VSAT and ground network	Lot	\$14,266.00
Installation Procedures - VSAT and ground network	Lot	\$38,912.00
Training Documentation - VSAT and ground network	Lot	\$19,378.00
<b>Sub Total Phase I</b>		<b>\$285,455.00</b>

<b>Phase II - provision of the Network and related Services</b>		
<i>Original price of Sub Total Phase II</i>		\$3,943,398.98
<i>Additional scope, subject of Amendment I</i>		\$84,798.00
<i>Removed scope, subject of Amendment I</i>		-\$3,840.00
<i>Addition to Phase II, subject of Amendment II</i>		\$32,316.00
<b>Sub Total of Phase II</b>		<b>\$4,056,672.98</b>

<b>Phase III - provision of the node in Brasilia (Brazil)</b>		
<i>Price of Sub Total Phase III, subject of Amendment III</i>		\$336,669.31
<b>Sub Total of Phase III</b>		<b>\$336,669.31</b>

<b>Total price, up to installation and site acceptance on every site in the countries identified in Article 2.2, on a DAP basis (Delivery At Place – Incoterms 2010)</b>	<b>\$4,678,797.29</b>
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*(see following page for detailed scope of supply and pricing for phases I, II and III)*

**Options:**

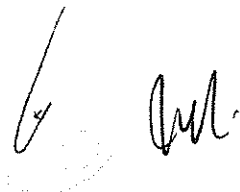
No.	Description	Total
1	Extension of MPLS services for up to additional 54 months (for details see Table 2)	\$33.090/ month (excl. node of Brasilia) \$34.290/ month (incl. node of Brasilia)
2	a) Civil works for Chile (transfer of existing antenna)	\$80,429
	b) Civil works for Chile (provision, transport and installation of a new antenna)	\$86,736



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Detailed scope of supply and pricing for each site, excluding Brasilia (Brazil), subject of Amendment II

*See Amendment II for corresponding 22 pages.*



Amendment III to Contract 22501200



**Detailed scope of supply and pricing for the node in Brasilia (Brazil),  
subject of Amendment III**

	Unit	Qty	Unit Price USD	Total USD	
<b>Brazil(Brasilia)</b>					
<b>Equipment: Routing System</b>					
NETGEAR SW F/E Stackable Managed Sw	u	2	559.50	1.119.00	
NETGEAR ProSafe VPN Dual WAN Gigabit	u	1	471.00	471.00	
RSS-16 : RSS 16 Slot 4U Chassis	u	1	5.264.00	5.264.00	
K16-RPC-WRI, 100-240 VAC, Mini : PWR MODULE, 1 Slot Redundant	u	1			
IPC-16-R : Network Control Card - 16	u	1			
AB-2RJ8-R : Dual 8 Wire Mod. Jack A/B Card	u	7			
AB-D25-R : D25 A/B Card	u	4			
RSS-16 : RSS 16 Slot 4U Chassis	u	1	3.980.00	3.980.00	
K16-RPC-WRI, 100-240 VAC, Mini : PWR MODULE, 1 Slot Redundant	u	1			
IPC-16-R : Network Control Card - 16	u	1			
AB-2RJ8-R : Dual 8 Wire Mod. Jack A/B Card	u	4			
AB-D25-R : D25 A/B Card	u	2			
FP-AB-RSS : Blank Panel for unused slots	u	15			
Cisco 2901 UC Bundle, PVDM3-16, UC License PAK DATA license	u	4	4.191.25	16.765.00	
4-Port Async/Sync Serial HWIC	u	2			
RS-232 Cable, DCE Female to Smart Serial, 10 Feet	u	2			
Two-port Voice Interface Card - E and M	u	8			
Two-Port Voice Interface Card - FXS and DID	u	6			
Four-port Voice Interface Card - FXO	u	2			
Cisco 2901 UC Bundle, PVDM3-16, UC License PAK DATA LICENCE	u	2	3.631.00	7.262.00	
2-Port Async/Sync Serial WAN Interface Card	u	1			
RS-232 Cable, DCE Female to Smart Serial, 10 Feet	u	1			
Two-port Voice Interface Card - E and M	u	2			
Two-Port Voice Interface Card - FXS and DID	u	2			
Two-port Voice Interface Card - FXO	u	1			
extra cost for stand alone REDDIG node		15%		5.229.15	
<b>TOTAL Equipment: Routing System</b>			<b>set</b>	<b>1</b>	<b>\$40,090</b>
<b>Equipment: VSAT Terminal</b>					
IDU 1070 19" NS + PS AC	u	2	16.855.50	33.711.00	
Lic-Key 1070 Full Power Package	u	2			
License OSPF	u	2			
Lic 8 PSK	u	2			
Lic-Key Mesh Topology	u	2			
Lic TCP-A	u	2			
extra cost for stand alone REDDIG node		15%		5.056.65	
<b>TOTAL Equipment: VSAT Terminal</b>			<b>set</b>	<b>1</b>	<b>\$38,768</b>

Amendment III to Contract 22501200



	Unit	Qty	Unit Price USD	Total USD
<b>Equipment: VSAT antenna</b>				
Supply, transport and installation of a new antenna	set	1	43,433.00	43,433.00
Supply and installation of a 3,8m Antenna	u	1		
New anchorage	u	1		
Transport DAP (Incoterm 2010) of the new antenna to the site	u	1		
VSAT antenna	set	1		
Civil work, including:	set	1	45,000.00	45,000.00
Construction of the slab with H30 concret and additives	u	1		
Ground system of the slab < 5 Ohms	u	1		
Trench and manholes from antenna to the technical room (considered distance < 70 m)	set	1		
<b>TOTAL Equipment VSAT antenna</b>	<b>set</b>	<b>1</b>		<b>\$88,433</b>
<b>Equipment: Network Management System</b>				
HP ProLiant DL160 Gen8 Base - Server, including:	u	1	14,939.00	14,939.00
Windows Server 2008 R2 Std + 5 CAL OEM HP	u	1		
Card PCI-Express 1X 8 ports series RS232 Std and Low Profile	u	1		
HP Hard Disk 300Go 3.5 SAS 15000 tours/min	u	2		
SAMSUNG screen LCD 27" Samsung SyncMaster S27A550H	u	1		
HP LaserJet Pro 400 M401dn /33ppm	u	1		
Eaton Ellipse ECO 1200 FR USB	u	1		
WhatsUp Gold Distributed Remote 25 Devices	u	1		
Antivirus	u	1		
IP to serial converter	u	1		
<b>TOTAL Equipment: Network Management System</b>	<b>set</b>	<b>1</b>		<b>\$14,939</b>
<b>Other VSAT equipments</b>				
IBUC 40W	u	2	11,952.00	23,904.00
Tx 1+1 switching system	u	1	6,858.00	6,858.00
Rx 1+1 switching system	u	1	7,501.00	7,501.00
LNB	u	2	569.50	1,139.00
Handheld Terminal	u	1	773.00	773.00
Set of breakers	u	1		
Coaxial connector	u	5	25.00	125.00
Coaxial cable	m	150	6.46	968.75
Power cable	m	400		
Cat 5 Cable	m	150	4.88	732.50
extra cost for stand alone REDDIG node		15%		6,300.19
<b>TOTAL Other VSAT equipments</b>	<b>set</b>	<b>1</b>		<b>\$48,301</b>
<b>Equipment: Ancillaries / Others</b>				
Horloge RT CP 09	u	1	5,449.00	5,449.00
Rack	u	1	2,504.00	2,504.00
IP telephone set to implement the teleconference in the REDDIG II network (including installation in the technical room and configuration)	u	1	360.00	360.00
Installation accessories	u	1	1,147.00	1,147.00
<b>TOTAL measuring &amp; Test equipment</b>	<b>set</b>	<b>1</b>		<b>\$9,460</b>
<b>Services: Installation</b>				
Installation of equipment on site	set	1	27,470.75	27,470.75
<b>TOTAL Services: Installation</b>	<b>set</b>	<b>1</b>		<b>\$27,471</b>
<b>Measuring equipment and tools</b>				
LAN/NETWORK Protocol Analyzer SignalTEK II	u	1	2,527.19	2,527.19
Multimeter (one for each site)	u	1	490.44	490.44
<b>TOTAL measuring &amp; Test equipment</b>	<b>set</b>	<b>1</b>		<b>\$3,018</b>

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	Unit	Qty	Unit Price USD	Total USD
<b>Documentation</b>	set	1	4,852.59	4,852.59
Preparation Studies office Installation drawing All Necessary documents for the Project As Built Drawing				
<b>TOTAL Documentation</b>	set	1		<b>\$4,852.59</b>
<b>Factory acceptance test in France</b>				
FAT preparation (procedures, platform, organisation, etc )	set	1	1,351.03	1,351.03
FAT development	set	1	1,298.35	1,298.35
Travel Brasil & REDDIG representative	set	2	1,528.61	3,257.22
DSA Brasil & REDDIG representative	u	14	358.00	5,012.00
<b>TOTAL Factory acceptance test in France</b>	set	1		<b>\$10,918.60</b>
<b>Site acceptance test</b>				
SAT preparation <i>SAT development:</i> On-site pre SAT with AAA Site tour with ICAO personnel- not applicable	set	1	1,458.75	1,458.75
	set	1	3,194.81	3,194.81
<b>TOTAL Site acceptance test</b>	set	1		<b>\$4,653.56</b>
<b>Theoretical-practical training sub-programme of ten (10) working days, to be conducted in Brasil (Air travel tickets included)</b>				
Training session (preparation, organization, air tickets, etc...)	set	1	20,000.00	20,000.00
DSA	u	10	290.00	2,900.00
<b>TOTAL Training: theoretical-practical</b>	set	1		<b>\$22,900.00</b>
<b>Technical assistance for ground backbone (including preventive maintenance)</b>				
Included in MPLS Services offer				
<b>TOTAL Technical assistance for ground backbone (including preventive maintenance)</b>	set	0		<b>\$0</b>
<b>MPLS services during the first six (6) months of operation of the new network.</b>				
Included in MPLS Services offer (For details see Table 1)				
<b>TOTAL MPLS services during the first six (6) months of operation of the new network.</b>	set	1		<b>\$0</b>
<b>Payment for the satellite segment during the first six (6) months of operation of the new network, if it is decided not to use the current satellite that provides such segment to the REDDIG (IS-14)</b>				
N/A				
<b>TOTAL Payment for the satellite segment during the first six (6) months of operation of the new network, if it is decided not to use the current satellite that provides such segment to the REDDIG (IS-14)</b>	set	0		<b>\$0</b>
<b>Warranty ( 2 years)</b>				
<b>TOTAL Warranty ( 2 years)</b>	set	1	\$11,099.75	<b>\$11,100</b>
<b>Shipment DAP Incoterm 2010 on each site and insurance</b>				
<b>TOTAL Shipment DAP Incoterm 2010 on each site and insurance</b>	set	1	\$11,246.19	<b>\$11,245</b>
Installation of the equipment for ground communication services	set	1	500.00	500.00
<b>TOTAL Brasilia node (Brazil)</b>	set	1		<b>\$336,669.31</b>

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**Detailed scope of supply of the new antenna for Paraguay, subject of Amendment I:**

	Qty.	Di.	Unit Price USD	Total Price USD	
<b>Paraguay (Asunción)</b>					
Supply, transport and installation of a new antenna	set	1	840,420	840,420	
Supply and installation of a 5.8m Antenna	-	-	-	-	
New anchorage	-	-	-	-	
Transport TAF (trailer + 1000) of the new antenna to the site	-	-	-	-	
Civil work, including:	set	1	60,000	60,000	
Construction of the slab with concrete and adoption	-	-	-	-	
Ground system of the slab + 8 Ohms	-	-	-	-	
French and mechanical fastenings in the concrete slab	set	1	-	-	
Maximum distance = 0.5m	-	-	-	-	
Transfer of the equipment to the new location	set	1	810,000	810,000	
<b>Notes</b>					
Ground studies of the new location of the antenna are not considered and not included above					
Slab foundation is standard 7.5m <sup>2</sup> with 100 kg iron reinforcement					
The distance between the new location and the technical room should not exceed 20 meters					
No road or airfield crossings are included					
The installation of the antenna will be held before or during the migration from the existing network to the new one. However, in case the work takes more time than provision for the migration time of the whole network, an interruption of the services of the site will be necessary. This case will be studied by INEC E&S and Q&D					
<b>TOTAL Paraguay (Asunción)</b>			set	1	884,798

Amendment III to Contract 22501200



Table 1 – Prices for MPLS services (ground communication services) during initial 6 months after commissioning of the Network (included in scope of supply)

	Site	BW	MRC
1	Argentina/Ezeiza	256 Kbps	\$830.00
2	Bolivia/La Paz	256 Kbps	\$3,300.00
3	Brazil/Curitiba	256 Kbps	\$830.00
4	Brazil/Recife	256 Kbps	\$1,050.00
5	Brazil/Manaus	256 Kbps	\$2,500.00
6	Chile/Santiago	256 Kbps	\$830.00
7	Colombia/Bogota	256 Kbps	\$1,050.00
8	Ecuador/Guayaquil	256 Kbps	\$830.00
9	French Guiana/Cayenna	256 Kbps	\$5,400.00
10	Guyana/Georgetown	256 Kbps	\$3,850.00
11	Paraguay/Asuncion	256 Kbps	\$1,800.00
12	Peru/Lima	256 Kbps	\$830.00
13	Suriname/Paramaribo	256 Kbps	\$8,450.00
14	Trinidad and Tobago/Piarco	256 Kbps	\$1,800.00
15	Uruguay/Montevideo	256 Kbps	\$1,800.00
16	Venezuela/Maiquetia	256 Kbps	\$4,200.00
<b>Sub-TOTAL per month</b>			<b>\$39,350.00</b>
<b>TOTAL for the first six (6) months of operation of the new network</b>			<b>\$236,100.00</b>

The above prices include all applicable taxes in the REDDIG II Member States.

The above prices include the leasing of modems and routers which remain the property of Level 3. At the time of installation, Level 3 will provide a detailed list of the leased equipment including serial numbers/ part numbers. Should ICAO/ the REDDIG II Member States choose not to continue to lease the MPLS services from Level 3 after the initial 6 month period, Level 3 will remove such equipment.

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Amendment III to Contract 22501200



Options

Option 1)

Table 2 – Prices for MPLS services (ground communication services) for additional 54 months after initial 6 month period.

	Site	BW	MRC
1	Argentina/Ezeiza	256 Kbps	\$830.00
2	Bolivia/La Paz	256 Kbps	\$2,700.00
3	Brazil/Curitiba	256 Kbps	\$830.00
4	Brazil/Recife	256 Kbps	\$1,050.00
5	Brazil/Manaus	256 Kbps	\$1,500.00
6	Chile/Santiago	256 Kbps	\$830.00
7	Colombia/Bogota	256 Kbps	\$1,050.00
8	Ecuador/Guayaquil	256 Kbps	\$830.00
9	French Guiana/Cayenna	256 Kbps	\$5,400.00
10	Guyana/Georgetown	256 Kbps	\$3,850.00
11	Paraguay/Asuncion	256 Kbps	\$1,800.00
12	Peru/Lima	256 Kbps	\$830.00
13	Suriname/Paramaribo	256 Kbps	\$5,800.00
14	Trinidad and Tobago/Piarco	256 Kbps	\$1,800.00
15	Uruguay/Montevideo	256 Kbps	\$1,800.00
16	Venezuela/Maiquetia	256 Kbps	\$2,190.00
<b>Sub-TOTAL per month</b>			<b>\$33,090.00</b>
<b>Total for twelve months of operation of network</b>			<b>\$397,080.00</b>
17	Brazil/Brasilia, subject of Amendment III	256 Kbps	\$1,200.00
<b>Sub-TOTAL per month, including node of Brasilia (Brazil)</b>			<b>\$34,290.00*</b>
<b>Total for twelve months of operation of network, including node of Brasilia (Brazil)</b>			<b>\$411,480.00</b>

The above prices include all applicable taxes in the REDDIG II Member States and are valid up to 54 months after Final Network Acceptance Test of Phase II of the Contract. Regarding the node of Brasilia (Brazil) the foregoing shall apply mutatis mutandis and the price shall be valid 60 months after Site Acceptance Test (SAT) of Phase III, subject of Amendment III.

\* The price of the node of Brasilia (Brazil) includes the leasing of modems and routers which remain the property of Level 3. The price shall only be included in the Sub-TOTAL per month upon satisfactory SAT of the node of Brasilia (Brazil).

In the event of a change in the tax legislation in one of the REDDIG II Member States (resulting in tax increase in one of the REDDIG II Member States), the parties may discuss a possible impact on the price for the MPLS services. If an agreement on a revised price cannot be reached, an according decrease of the duration of the remaining MPLS service period may be applied.

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Amendment III to Contract 22501200



**Options 2)**

**Civil works for Chile:**

The prices for the below options are valid for 12 months after the date of original Contract coming into force.

In case the below options are exercised, the integration of the antenna by the Contractor into the REDDIG II Network is included.

Alternatively, Chile may choose a third party to provide and install the antenna, according to the agreed implementation schedule. In such case, the Contractor assumes responsibility to integrate the antenna into the REDDIG II Network, at no additional cost. However, it would be the responsibility of Chile to ensure proper installation of the antenna prior to arrival of the Contractor's integration personnel as all 16 nodes will be integrated simultaneously.

**Note:** Chile will be responsible for the timely and proper installation of the antennas. In case of delayed or improper installation, the Contractor will not be held liable for consequences resulting therefrom.

**Option 2a)**

**Chile: Transfer of existing antenna:**

	Unit	Qty	Unit Price (USD)	Total Price
<b>Chile (Santiago)</b>				
<b>Displacement of the current antenna including:</b>				
Displacement of the existing antenna	set	1	\$18,000	\$18,000
Installation of the antenna	set	1		
New air bridge	set	1		
<b>Civil work, including:</b>				
Construction of the slab with HRB rebar and a 150kg	set	1	\$40,000	\$40,000
Ground system of the slab - 5 Ohms	set	1		
Drain and manholes from antenna up to 50m	set	1		
<b>Crane renting, including:</b>				
Rent of the crane, security elements	set	1	\$19,700	\$19,700
Transfer of the equipment to the destination	set	1		
<b>Notes:</b>				
Ground studies in the new location of the VSAT antenna are not considered and not included above.				
Slab thickness is standard 1' and with 150kg air construction.				
The distance between the new location and the technical room should not exceed 50 meters.				
Network of air line crossing are included.				
The antenna, reinstallation of the antenna will be held during the migration from the existing network to the new one. However, in case of this work takes more time than the provided one for the migration time for the whole network, an interruption of the services of the 3G will be necessary. This case will be studied by INEC/ESS and KCAO.				
<b>TOTAL Chile (Santiago)</b>	set	1		\$80,400



**Option 2b)**

**Chile: Provision, transport and installation of a new antenna**

	Unit	Qty	Unit Price	Total Price	
<b>Chile (Santiago)</b>					
Supply, transport and installation of a new antenna	lot	1	624.000	624.000	
Supply and installation of a 1.5 m x 4 m x 2 m antenna	lot	1			
Power cable	lot	1			
Transport (air freight) of the new antenna to the site	lot	1			
Civil work, building	lot	1	111.000	111.000	
Construction of the 100 mm x 100 mm x 100 mm concrete	lot	1			
Ground system of the site 1.5 m x 4 m	lot	1			
Transport and installation from generator to the technical room (estimated distance = 20m)	lot	1			
Transfer of the equipment to the new location	lot	1	11.000	11.000	
<p>Notes:</p> <p>Current status of the new location of the UHF antenna are not considered and not included above.</p> <p>Site location is standard 7 feet with 150 kg iron construction.</p> <p>The distance between the new location and the technical room should not exceed 50 meters.</p> <p>No road or airfield clearing was included.</p> <p>The installation of the antenna will be held before or during the migration from the existing network to the new one. However, in case this work takes more time than foreseen for the migration time of the whole network, an interruption of the services of the site will be necessary. This case will be studied by INEC, E&amp;S and O&amp;A.</p>					
<b>TOTAL Chile (Santiago)</b>			lot	1	746.000

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**"Revised Attachment VI  
Model Provisional Site/Final Network/ Site\* Acceptance Test Certificate - Sample**

The present certificate is to attest that the Provisional Site /Final Network/Final Site\* Acceptance Tests as stipulated in Article 13.0 of Contract \_\_\_\_\_, signed on \_\_\_\_\_, between ICAO and \_\_\_\_\_ has been carried out and proved to be satisfactory. for the following items (or part of items) :

Comments (if any) :

\*= mark applicable

\_\_\_\_\_  
**REDDIG II PROJECT GROUP  
Representative**

\_\_\_\_\_  
**Contractor Representative**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Date**

*[Handwritten signature]*  
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*[Handwritten signature]*

*[Handwritten signature]*

Amendment III to Contract 22501200



**Revised Attachment IX  
Contract Implementation Schedule**

Item Nb	Completion Date (weeks)	Activity
<b>Phase I</b>		
1	T0	Contract Commencement Date
2	T0 + 10	SDD
<b>Phase II</b>		
3	T0 +	FAT satellite backbone
4	T0 +	Delivery to the sites (to each REDDIG II Member State)
5	T0 +	Training
6	T0 +	Installation
7	T0 +	PSAT
8	T0 + 66	FNAT
<b>Phase III</b>		
9	T1 +	Signature of Amendment III
10	T1 + 5	SDD
11	T1 +	FAT
12	T1 +	Delivery to Brasilia
13	T1 +	Training
14	T1 +	Installation
15	T1 + 28	SAT

The Contractor's proposed Implementation schedules A and B are attached for information purposes only. As per Article 9.2 and 7.2.4, each of the updated Implementation Schedules is to be submitted with the System Design Documentation and shall include, amongst others, the above milestones.

The Contract completion time frame of fifteen and a half (15.5) months (excluding the Brasilia node) as indicated in Article 9.1 shall remain unchanged. Delivery, installation and commissioning of the Brasilia node shall not exceed seven (7) months from the date of signature of Amendment III.

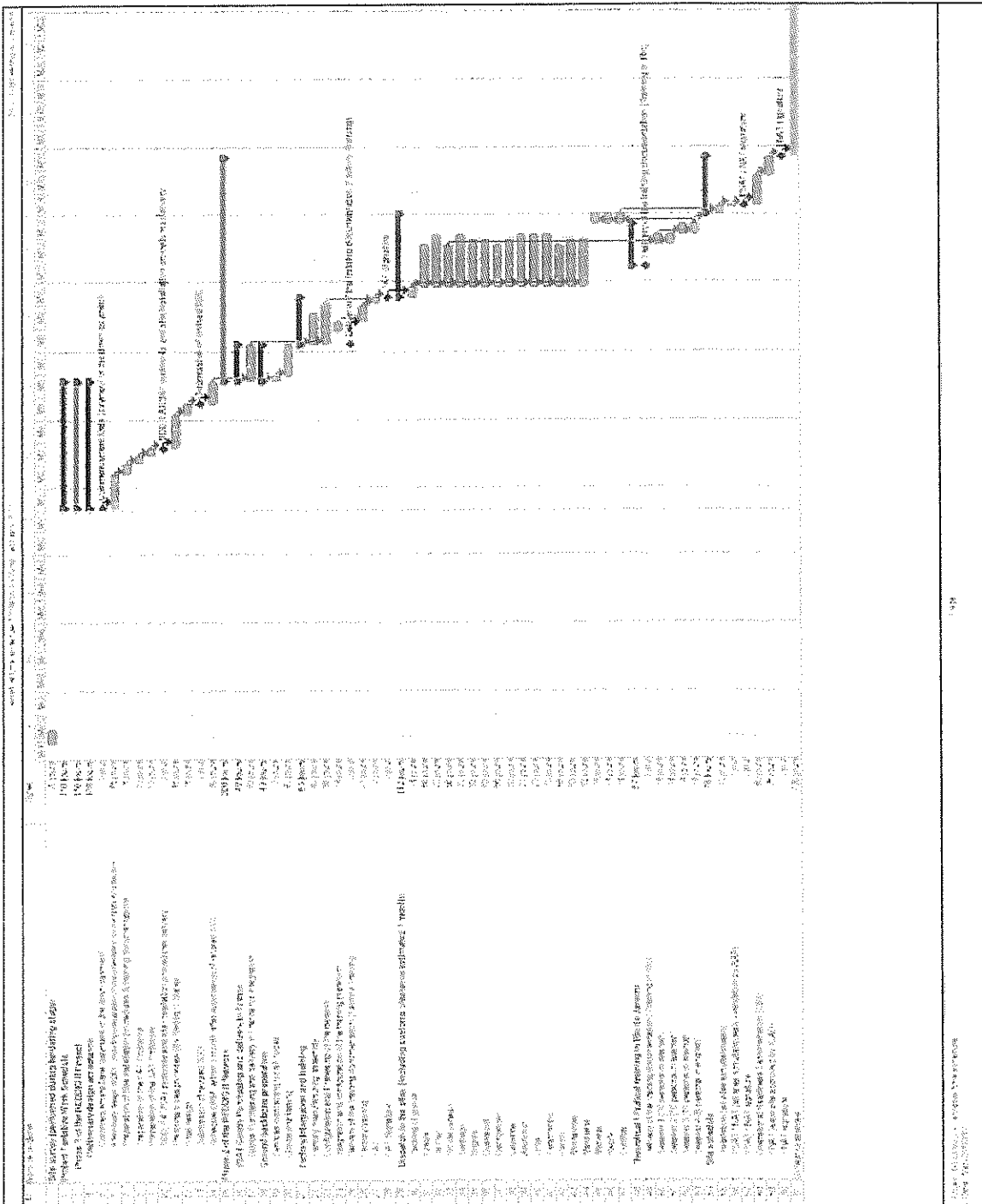
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Amendment III to Contract 22501200



A. Implementation Schedule (Phase II) (for information only)



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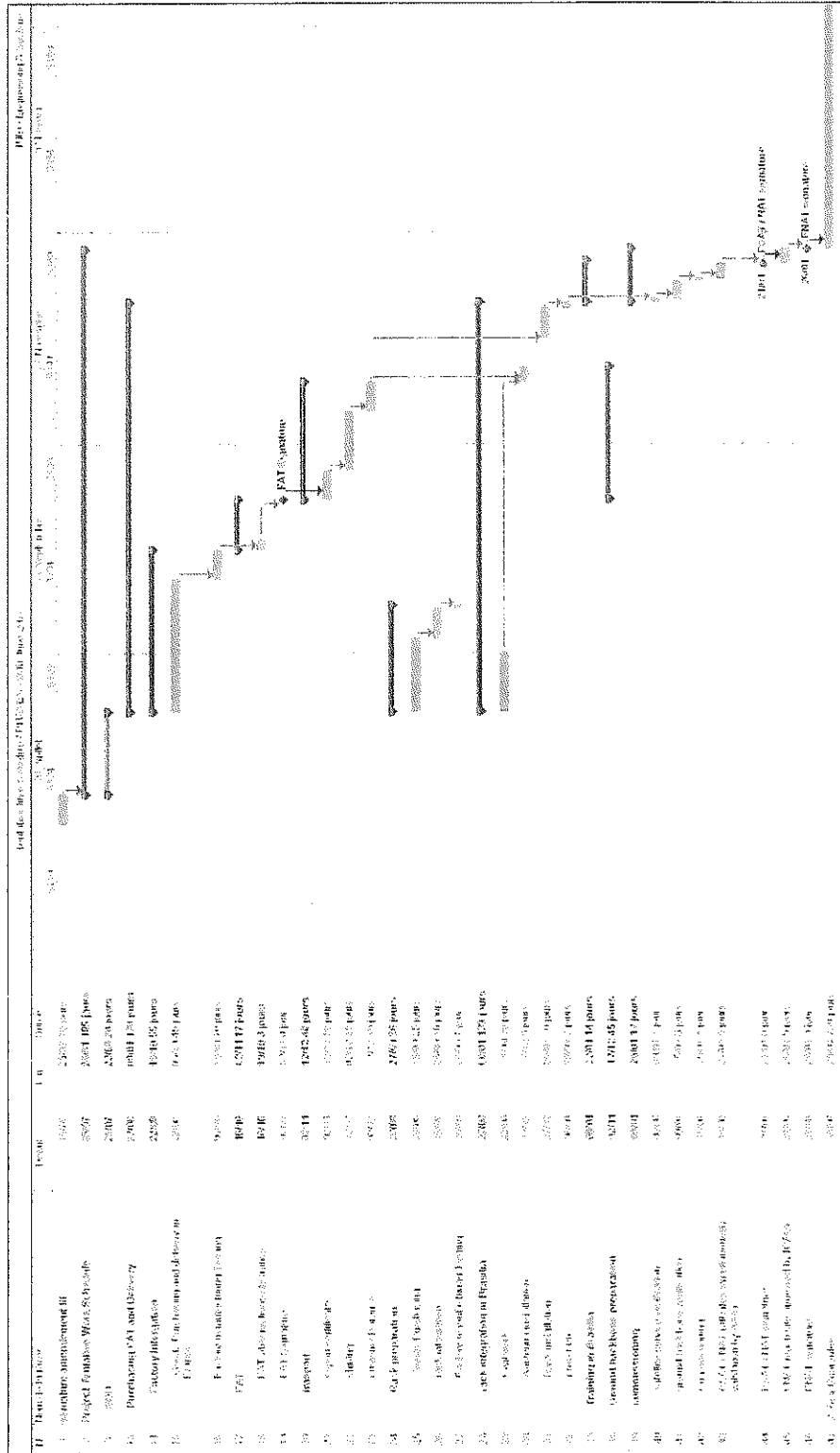
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Amendment III to Contract 22501200



B. Implementation Schedule for the Brasilia node (Phase III) (for information only)



Ames.

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APPENDIX F / APÉNDICE F

				<b>Brasilia Services</b>							
<b>TELEPHONY</b>											
Service	PLAR number (autodial)	Destination routing number	Translation rule	Local routing number (station id-number)	#of difgits forwarded	Usual dial number	Router name	Slot/port	Type	Cable number	Plug
							SBBR-CISCO-VSAT-1	0/1/0	FXO		
							SBBR-CISCO-VSAT-1	0/1/1	FXO		
							SBBR-CISCO-VSAT-1	0/1/2	FXO		
							SBBR-CISCO-VSAT-1	0/1/3	FXO		
Mant/Adm						3401	SBBR-CISCO-VSAT-1	0/2/0	FXS		
						Libre	SBBR-CISCO-VSAT-2	0/2/1	FXS		
Mant/Adm						34XXXX	SBBR-CISCO-VSAT-2	0/0/0	E&M type V		
Mant/Adm						34XXXX	SBBR-CISCO-VSAT-2	0/0/1	E&M type V		
ATS /Swtc						34XX	SBBR-CISCO-VSAT-2	0/1/0	E&M type V		
ATS /Swtc						34XX	SBBR-CISCO-VSAT-2	0/1/1	E&M type V		
ATS /Swtc						34XX	SBBR-CISCO-VSAT-2	0/2/0	E&M type V		
ATS /Swtc						34XX	SBBR-CISCO-VSAT-2	0/2/1	E&M type V		
Service	PLAR number (autodial)	Destination routing number	Translation rule	Local routing number (station id-number)	#of difgits forwarded	Usual dial number	Router name	Slot/port	Type	Cable number	Plug
ATS /Swtc						34XX	SBBR-CISCO-GBB-1	0/1/0	E&M type V		
ATS /Swtc						34XX	SBBR-CISCO-GBB-1	0/1/1	E&M type V		
ATS /Swtc						34XX	SBBR-CISCO-GBB-1	0/2/0	E&M type V		
ATS /Swtc						34XX	SBBR-CISCO-GBB-1	0/2/1	E&M type V		
Mant/Adm						3401	SBBR-CISCO-GBB-2	0/0/0	FXS		
							SBBR-CISCO-GBB-2	0/0/1	FXS		
							SBBR-CISCO-GBB-2	0/1/0	FXO		
							SBBR-CISCO-GBB-2	0/1/1	FXO		



Data

SERIAL - AFTN DESTINATION	Router	Port	BSTUN num	Primary /secondary	Cable number	Plug
SOCA	SBBR-CISCO-VSAT-1	0/0/0				
	SBBR-CISCO-VSAT-1	0/0/1				
	SBBR-CISCO-VSAT-1	0/0/2				
	SBBR-CISCO-VSAT-1	0/0/3				
	SBBR-CISCO-VSAT-GBB-1	0/0/0				
	SBBR-CISCO-VSAT-GBB-1	0/0/1				

APPENDIX G / APENDICE G



**Amendment IV to Contract 22501200 for the Provision of a New Regional Aeronautical Telecommunication Network (REDDIG II) and associated equipment and services for the REDDIG II Member States.**

Contract 22501200 for the Provision of a New Regional Aeronautical Telecommunication Network (REDDIG II) and associated equipment and services for the REDDIG II Member States (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Trinidad & Tobago, Uruguay and Venezuela) is hereby amended to include the possibility of a separate Final Network Acceptance Test (FNAT) for the ground backbone of the Network and to revise the payment terms accordingly.

This Amendment IV shall form part of ICAO Contract 22501200 between the International Civil Aviation Organization (ICAO) acting on behalf of and as mandatary for the REDDIG II Member States, and the Consortium consisting of INEO Engineering and Systems and LEVEL 3 PERÚ S.A. and shall become effective on the date of signature of this document by ICAO, INEO Engineering and Systems and LEVEL 3 PERÚ S.A.

All articles of Contract 22501200 not covered in this Amendment IV or previous Amendments I and III shall remain unchanged and in force.

*Article 13.6.1 is added and Articles no. 5.2 is hereby amended and shall become:*

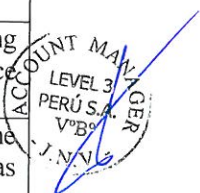
**5.2 Payment Schedule and Invoicing**

5.2.1 All invoices shall be issued to ICAO Finance Branch for payment in accordance with the payment schedule as indicated below:

Ref.	Payment Term for Phase I
1	US \$114,182 representing 40% of the price of Phase I as down payment with acceptable Bank Guarantee (as per invoice 8500006629)
2	US \$171,273 representing 60% of the price of Phase I upon approval of the SDD (as per invoice 8500007772)
Ref.	Payment Term for Phase II
3	US \$1,136,477.09 as down payment with acceptable Bank Guarantee (as per invoices 8500007773 and 8500008502)
4	a) US \$1,337,200.54 representing 35% of the price of Phase II, excluding the leasing of ground communication services (Table 1 of Attachment II); and b) US \$9,694.80 representing 30% of the addition to Phase II, subject of Amendment II (both payments as per invoice ESF1214003) upon the last shipment of equipment and acceptable Bank Guarantee
5	US \$382,057.30 representing 10% of the price of Phase II, excluding the leasing of ground communication services (Table 1 of Attachment II) (as per invoice ESF0914004), upon completion of theoretical-practical training
6	a) US \$573,085.95 representing 15% of the price of Phase II, excluding the leasing of ground communication services (Table 1 of Attachment II) (as per invoice ESF0315001); and



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	b) <b>US \$118,050</b> representing 50% of Table 1 of Attachment II upon satisfactory Provisional Site Acceptance Test (PSAT)
7	<b>US \$382,057.30</b> representing 10% of the price of Phase II, excluding the leasing of ground communication services (Table 1 of Attachment II), upon satisfactory Final Network Acceptance Test (FNAT) and Acceptable Performance Bond
8	<b>US \$118,050</b> representing 50% of Table 1 of Attachment II three months after satisfactory Final Network Acceptance Test (FNAT); <b>or</b> , if Article 13.6.1 applies, upon satisfactory FNAT of the ground backbone of the Network.
<b>Ref.</b>	<b>Payment Term for Phase III</b>
9	<b>US \$134,467.72</b> representing 40% of the price of Phase III (excluding US \$500 for installation of equipment for ground communication services), as down payment with acceptable Bank Guarantee
10	<b>a) US \$201,701.59</b> representing 60% of the price of Phase III (excluding US \$500 for installation of equipment for ground communication services), and <b>b) US \$500</b> for installation of equipment for ground communication services upon satisfactory Site Acceptance Test (SAT)

5.2.2 Correct invoices shall be accepted by ICAO for the above payments provided they are accompanied or preceded by the documents as set forth in Articles 5.2.2.1 to 5.2.2.10, using the table references as indicated under Article 5.2.1.

**5.2.2.1 Down Payment on placement of order for Phase I against invoice 8500006629 and submission of an acceptable Bank Guarantee:**

The Contractor shall submit:

- i. One (1) original invoice 8500006629 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 1;
- ii. Acceptable Bank Guarantee, as per Article 6.1.

**5.2.2.2 Progress Payment against invoice 8500007772 upon approval of the System Design Document (SDD):**

The Contractor shall submit:

- i. One (1) original invoice 8500007772 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 2;
- ii. Written confirmation of approval of the SDD from the REDDIG II PROJECT GROUP.

**5.2.2.3 Down Payment on placement of order for Phase II against invoices 8500007773 and 8500008502 and submission of an acceptable Bank Guarantee**

The Contractor shall submit:

- i. One (1) original invoice 8500007773 and 8500008502 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 3;
- ii. Acceptable Bank Guarantee, as per Article 6.2.

**5.2.2.4 Progress Payment at the last shipment of equipment against invoice ESF1214003 and submission of an acceptable Bank Guarantee:**

The Contractor shall submit:

- i. One (1) original invoice ESF1214003 plus one (1) copy covering the cumulative amount as per Article 5.2.1, Ref. 4a and 4b);
- ii. One (1) original Factory Acceptance Certificate duly signed as per Article 11.7;
- iii. Acceptable Bank Guarantee, as per Article 6.3.
- iv. Shipping documents and insurance certificate as per Article 9.9.

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5.2.2.5 **Progress Payment at satisfactory completion of theoretical-practical training against invoice ESF0914004:**

- i. One (1) original invoice ESF0914004 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 5;
- ii. Written confirmation of satisfactory completion of theoretical-practical training from the REDDIG II PROJECT GROUP;

5.2.2.6 **Progress Payment at satisfactory Provisional Site Acceptance against invoice ESF0315001:**

The Contractor shall submit:

- i. One (1) original invoice ESF0315001 plus one (1) copy covering the amount as per Article 5.2.1, Ref. 6a);
- ii. Sixteen (16) original Provisional Site Acceptance Certificates (one from each site) duly signed as per Article 13.1.

Level 3 shall submit:

- iii. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 6b;
- iv. A copy of the sixteen (16) Provisional Site Acceptance Certificates (one from each site) duly signed as per Article 13.1.

5.2.2.7 **Progress Payment at satisfactory Final Network Acceptance:**

The Contractor shall submit:

- i. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 7;
- ii. One (1) original Final Network Acceptance Certificate duly signed as per Article 13.6;
- iii. Acceptable Performance Bond as per Article 6.5.

5.2.2.8 **Progress Payment three (3) months after satisfactory Final Network Acceptance or, if Article 13.6.1 applies, upon Final Network Acceptance of the ground backbone of the Network:**

Level 3 shall submit:

- i. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 8;
- ii. One (1) original Certificate of satisfactory provision of the ground communication services (Attachment X) duly signed by REDDIG II PROJECT GROUP.
- iii. If Article 13.6.1 applies, one (1) original Final Network Acceptance Certificate for the ground backbone of the Network.

5.2.2.9 **Down Payment on signature of Amendment III for Phase III and submission of an acceptable Bank Guarantee:**

The Contractor shall submit:

- i. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 9;
- ii. Acceptable Bank Guarantee, as per Article 6.3.

5.2.2.10 **Progress Payment at satisfactory Site Acceptance of the Brasilia node:**

The Contractor shall submit:

- i. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 10a);
- ii. One (1) original Site Acceptance Certificate duly signed as per Article 13.13;
- iii. Acceptable Performance Bond as per Article 6.5;

The Contractor or Level 3 shall submit:



- iv. One (1) original invoice plus one (1) copy covering the amount as per Article 5.2.1, Ref. 10b);
- v. One (1) original Site Acceptance Certificate duly signed as per Article 13.13.”

5.2.3 Payments shall be effected by bank transfer to the Contractor’s account (Level 3’s account for payment reference 6 b) and 8), indicated on the invoices within thirty (30) days after receipt of correct invoice and documentation as outlined in Article 5.2.2. The bank charges for such transfers shall be borne by the Contractor and/or Level 3.”

“13.6.1 If, for reasons not attributable to Level 3, the FNAT does not take place within six (6) months of the date of the last PSAT, and the REDDIG II Member States confirm satisfactory receipt of the MPLS Services for at least six (6) months for all sites since the last PSAT, a separate FNAT certificate solely for the ground backbone of the Network shall be signed. In such case, Level 3 shall be entitled to invoice the amount as per Article 5.2.1, Ref. 8, and the initial six (6)-month leasing of related ground communication services as per Article 2.3 shall be deemed to have been provided since the date of the last PSAT. Subsequently, Level 3 shall undertake to accept a Purchase Order for the leasing of MPLS Services as per Article 5.1.6.”

*Attachment X is hereby revised to reflect satisfactory provision of ground communication services after the last Provisional Site Acceptance Test.*

Signed on

14 January 2016  
Date

on behalf of:

**Jacques-Olivier KLOTZ**

Aeronautical Export  
Department Director

INEO Engineering and Systems

ICAO  
Technical Cooperation Bureau



Luis Ladera Zambrano  
REPRESENTANTE LEGAL  
LEVEL 3 PERÚ S.A.

LEVEL 3 PERÚ S.A.

OSWALDO CLAROS UGALDE  
REPRESENTANTE LEGAL  
LEVEL 3 PERÚ S.A.



**Revised Attachment X  
Model Satisfactory Provision of Ground Communication Services Certificate - Sample**

The present certificate is to attest that the Ground Communication Services as stipulated in Article 2.3 of Contract \_\_\_\_\_, signed on \_\_\_\_\_, between ICAO and \_\_\_\_\_ have been provided for a period of three (3) months after FNAT\*/ six (6) months after the last PSAT\* and proved to be satisfactory.

Comments (if any) :

\* Mark applicable

\_\_\_\_\_  
**REDDIG II PROJECT GROUP  
Representative**

\_\_\_\_\_  
**Contractor Representative**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Date**



**Amendment IV to Contract 22501200**

FINAL NETWORK ACCEPTANCE TEST CERTIFICATE

**Reference:** International Civil Aviation Organization (ICAO)  
Contract: 22501200  
REDDIG II Network  
RLA/03/901 -- REDDIG II Project Group

*We hereby acknowledge that the REDDIG II ground backbone network and associated equipment and services have been verified in accordance with mutually agreed upon test procedures with satisfactory result*

**On behalf of INEO Engineering and Systems / Level 3**

**Ineo Engineering & Systems**  
Inovel Parc Sud  
23, rue du Général Valérie André  
78140 Vélizy Villacoublay - France  
Tél. 33 (0)1 39 26 15 00 - Fax 33 (0)1 30 70 17 20

*Thierry Su*  
*T. Su*  
*01/07/2015*

\_\_\_\_\_  
**Authorized Representative (BLOCK LETTERS)**

*Gianni Hanawa Makabe*  
\_\_\_\_\_  
Signature and Date  
GIANNI HANAWA MAKABE  
REPRESENTANTE LEGAL  
LEVEL 3 PERÚ S.A.

*Oswaldo Claros Ugalde*

\_\_\_\_\_  
OSWALDO CLAROS UGALDE  
REPRESENTANTE LEGAL  
LEVEL 3 PERÚ S.A.

**On behalf of the REDDIG II Project Group**

Onofrio Smarrelli  
**Authorized Representative (BLOCK LETTERS)**

*Onofrio Smarrelli*  
\_\_\_\_\_  
Signature and Date  
*15 July 2015*



**APPENDIX H / APÉNDICE H**

**MEMORANDUM OF UNDERSTANDING BETWEEN  
STATES/TERRITORIES/INTERNATIONAL ORGANISATIONS MEMBERS OF MEVA III  
AND REDDIG II PROJECT ORGANISATION**

**1. SECTION 1. INTRODUCTION AND PURPOSE OF THIS DOCUMENT**

**1.1 INTRODUCTION**

1.1.1 With the aim of effectively and efficiently fulfilling aeronautical telecommunications requirements in these regions, the members of the MEVA II and REDDIG VSAT networks decided to interconnect the two networks. For this purpose, the Members agreed to establish this Memorandum of Understanding (MoU). This Agreement is being established jointly under coordination of the ICAO North American, Central American, and Caribbean (NACC) Office in Mexico City, Mexico and the ICAO South American (SAM) Office, in Lima, Peru.

1.1.2 The Third MEVA II / REDDIG Coordination Meeting (MR/3) concluded that the interconnection implementation will operate for a five-year period, as an initial basis, after finalising the implementation.

1.1.3 The First MEVA III / REDDIG II Coordination Meeting concluded that the interconnection implementation will be renewed for five initial year period, after finalizing the implementation.

1.1.4 The main body of this document consists of four (4) sections and 2 Appendices. The content of the sections and appendices is summarised below: In accordance with the interconnection development, when considered necessary, and if the interested Parties of both networks agree to do so, other Appendices could be added as necessary.

Section 1.0: Presents a brief overview and statement of purpose.

Section 2.0: Provides an explanation of the Technical Cooperative Agreement process.

Section 3.0: Describes the technical terms of reference.

Section 4.0: Describes the financial responsibilities of the parties to this agreement.

Appendix A: A list of reference documents used in support of this Agreement.

Appendix B: Technical-operational coordination agreement for the establishment of VSAT MEVA III and REDDIG II networks interconnection

1.1.5 This document is based on the former MEVA II - REDDIG Memorandum of Understanding (MoU).

**1.2 SECTION 1 – PURPOSE**

1.2.1 The goal of this MoU is to foster a coordinated plan for in the development of MEVA III and REDDIG II networks and its interconnection implementation.

1.2.2 This MoU is a living document through which members of the MEVA III and REDDIG II networks shall convene, as necessary and at locations agreed upon, to review or amend the details of the Agreement. Revised versions of this Agreement, or paragraph changes, shall be coordinated and distributed by the ICAO NACC and SAM Regional Offices to the signatory parties of the Agreement as appropriate.

1.2.3 This MoU document establishes the following coordination and cooperation process:

- a) The holding of coordination meetings, if required, to analyse and identify the new service requirements for the MEVA III and REDDIG II VSAT networks interconnection.
- b) The exchange of technical reports and documentation, program plans and schedules, as may become necessary, to assure the successful and timely completion of these efforts.
- c) Operational-technical coordination between the Parties involved in MEVA III and REDDIG II networks, as necessary.
- d) Planning, technical coordination, and development participating member States/Territories/International Organisations of the MEVA III and REDDIG II Networks.

## 2. SECTION 2 – THE TECHNICAL COOPERATIVE AGREEMENT PROCESS

2.1 To reach the goal of this MoU, the MEVA III and REDDIG II members have developed an interconnection solution to operate during a five-year phase after the implementation of the interconnection of the MEVA III and REDDIG II Networks.

### 2.2 RELATIONSHIPS AND RESPONSIBILITIES OF THE PARTIES

2.2.1 In order to achieve the interconnection of the networks in a timely and mutually beneficial way, the parties to this Agreement recognise the need to coordinate their actions and exchange updated operational-technical information.

2.2.2 The Parties also recognise the need to develop common technical solutions for interconnecting and/or integrating these networks, in a manner that shall not negatively impact the planned operation, performance, or management of the either network.

2.2.3 ICAO NACC and SAM Regional Offices shall convene coordination meetings, as needed.

2.2.4 The Parties of this MoU agree to exchange reports, technical documents, plans and programming that may be necessary in order to guarantee the interconnection and the implementation of the new services.

2.2.5 The Parties of this MoU agree to implement during a 5 year phase the MEVA III / REDDIG II interconnection solution as presented in Appendix B.

3. **SECTION 3 – TECHNICAL TERMS OF REFERENCE**

3.1 The interconnection solution's objectives and their technical operational principles are described under the Appendix B of this document.

4. **SECTION 4 – FINANCIAL RESPONSIBILITIES OF THE NETWORK PARTIES**

4.1 MEVA III / REDDIG II Members shall, as individual administrations, be responsible for their own financial obligations, in accordance with the Agreement contained in Appendix B.

4.2 The Parties to this Agreement understand that they shall not commit to any action that may result in a financial obligation to other Parties, without first obtaining an Agreement, in writing, from all other parties to this Agreement.

**NOTES:**

MEVA III - The term "MEVA III", as used in this document, refers to the VSAT network currently providing voice and data aeronautical telecommunications services to States/Territories/International Organisations in the Caribbean Region. The network is managed by Caribbean States/Territories/International Organisations members, through the Technical MEVA Group (TMG), and is coordinated by the ICAO NACC Regional Office.

REDDIG II - The term "REDDIG II", as used in this document, refers to the VSAT network presently implemented in the South American region under the technical cooperation project RLA/03/901 coordinated by the ICAO Lima Office.

**APPENDIX A****A LIST OF REFERENCE DOCUMENTS USED IN SUPPORT OF THIS AGREEMENT**

- Contract N| 2250128 between the International Civil Aviation Organization and COMSOFT GmbH for the provision of the Interconnection of the MEVA III and REDDIG II Satellite Telecommunications Network for MEVAIII and REDDIG II Member States/Territory/International Organization
- Acuerdo de gestión de servicios entre la Cooperación Centroamericana de Servicios de Navegación Aérea (COCESNA) y la OACI Proyecto RLA/09/901 Interconexión del Nodo MEVAII de COCESNA a la REDDIG
- Contract No. 22501200 between the International Civil Aviation Organization and the consortium consisting of INEO Engineering and Systems and LEVEL 3 PERÚ S.A. for the Provision of a New Regional Aeronautical Telecommunication Network (REDDIG II) and associated equipment and services
- Manual de operación de la REDDIG II
- MEVA III Document of Agreement
- MEVA III Service Level Agreement

## **APPENDIX B**

### **TECHNICAL-OPERATIONAL COORDINATION AGREEMENT FOR THE ESTABLISHMENT OF VSAT MEVA III AND REDDIG II NETWORKS INTERCONNECTION**

#### **1. SECTION 1 – PURPOSE OF THIS AGREEMENT**

##### **1.1 PURPOSE**

1.1.1 To establish technical, operational and administrative aspects necessary for the digital VSAT MEVA III and REDDIG II networks interconnection, to meet aeronautical telecommunications requirements between the CAR/SAM Regions.

#### **2. SECTION 2 – CO-OPERATIONAL TECHNICAL PROCESS OF THE AGREEMENT**

##### **2.1 RELATIONSHIP AND RESPONSIBILITIES OF THE PARTIES**

2.1.1 During this stage, the management of MEVA III and REDDIG II shall continue with their respective service providers, i.e, REDDIG II shall continue with its REDDIG Administration, and MEVA III, with the MEVA III Service Provider.

2.1.2 States/Territories/International Organisations members of MEVA III and REDDIG II networks shall be responsible for the normal operation of each of their nodes, having to establish mechanisms necessary to ensure the degree of availability required for each of the services under consideration.

#### **3. SECTION 3 – TECHNICAL TERMS OF REFERENCE**

##### **3.1 TECHNICAL TERMS OF REFERENCE**

3.1.1 Members of MEVA III and REDDIG II networks have mutual interest in establishing the interconnection of their respective communications networks in a manner that they provide the capacity for current and future voice and data aeronautical telecommunications services between the designated nodes within these networks, so as to support aeronautical telecommunications in the CAR/SAM Regions.

3.1.2 The interconnection technical solution shall be carried out under premise that the REDDIG II and MEVA III VSAT network is developed under a full mesh network topology, using TDMA satellite access, as well as a IS-14 satellite transponder with a beam directed over United states / Latin America, C-band operation frequencies and co-linear vertical polarisation.

3.1.3 For the interconnection of the additional equipment to be initially installed at each node involved, MODEM, as well as any other necessary equipment required.

3.1.4 The interconnection implies the following implementations:

- a) Additional equipment at Bogota (Colombia) and Caracas (Venezuela), REDDIG II nodes; and
- b) Additional equipment at Tegucigalpa, Honduras, COCESNA MEVA III node.

### 3.2 MANAGEMENT TERMS OF REFERENCE

3.2.1 Implementation of the interconnection option shall not involve modifications to the technical, operational and control management of MEVA III and REDDIG II networks, with exception of the necessary maintenance coordination procedures detailed in paragraph 3.2.5 of this Attachment.

3.2.2 The configuration, synchronisation, supervision and control of additional MODEMs participating in the interconnection and installed at REDDIG II nodes, shall be carried out by the MEVA III Network Control Centre (NCC). Also, the configuration, synchronisation, supervision and control of additional MODEMs participating in the interconnection and installed at MEVA III nodes, shall be carried out by the REDDIG NCC.

3.2.3 The bandwidth, number and type of circuits installed in the MEVA III node for communications with REDDIG II, shall be managed by REDDIG II.

3.2.4 The bandwidth, number and type of circuits installed in the REDDIG II node for communications with MEVA III, shall be managed by MEVA III.

#### 3.2.5 Maintenance coordination procedures between the NCCs

3.2.5.1 When there is any problem in a REDDIG II node, with the MODEM or other equipment involved in the interconnection with MEVA III, the following shall be applied:

- a) MEVA III Service Provider shall call the REDDIG II Administration informing of the happening;
- b) The REDDIG II Administration shall phone the respective node and shall establish an audio teleconference between MEVA III Service Provider and Caracas or Bogota local technicians, as necessary;
- c) REDDIG II NCC, under control of the REDDIG II Administration, shall supervise communications between MEVA III Service Provider and REDDIG II nodes technicians.
- d) The MEVA III Service Provider is the only one that may call the REDDIG II Administration to start or close the respective trouble ticket.

3.2.5.2 When there is any problem in a MEVA III node, with the MODEM or other equipment affect the interconnection with REDDIG, the following shall be applied:

- a) The REDDIG II Administration shall call the MEVA III Service Provider informing of the happening;
- b) The MEVA III Service Provider shall call the respective node and shall establish an audio conference between REDDIG II Administration and local technicians, as necessary;
- c) MEVA III NCC, under control of the Service Provider, shall supervise communications between REDDIG II Administration and MEVA III nodes technicians.
- d) The REDDIG II Administration is the only one that may call the MEVA III Service Provider to start or close the respective trouble ticket.

### 3.2.6 Security requirements

3.2.6.1 The minimum security arrangements required by REDDIG II, and that should be followed by the MEVA III, are:

- a) MEVA III network have no direct communications with public networks.
- b) The equipment is not shared with services different to MEVA III.
- c) Access restriction to equipment belonging to the network, through the use of a password.
- d) The network must exclusively support services to which it was originally constituted for.

3.2.6.2 The minimum security arrangements required by MEVA III, and that shall be followed by REDDIG II, are:

- a) REDDIG II network have no direct communications with public networks.
- b) The equipment is not shared with services different to REDDIG II.
- c) Access restriction to equipment belonging to the network, through the use of a password.
- d) The network must exclusively support services to which it was originally constituted for.

## 4. SECTION 4 – FINANCIAL RESPONSIBILITIES OF THE PARTIES

### 4.1 EQUIPMENT PURCHASING

4.1.1 Additional equipment to be installed at REDDIG II nodes, with MEVA III MODEMs requirements, can be included in the leased contract established between ICAO, in behalf of the REDDIG II members, and the MEVA III Service Provider in accordance with the requirements established for the interconnection.

4.1.2 Additional equipment to be installed at MEVA III nodes, with REDDIG II MODEMs requirements, can be purchased by MEVA III members (States, Territories, Organisations) in accordance with the requirements established for the interconnection.

### 4.2 SPARE PARTS LOT PURCHASING

4.2.1 The spare parts for the additional equipment to be installed at the REDDIG II nodes, with MEVA III MODEM and other device requirements, can be included in the leasing contract established between ICAO, on behalf of the REDDIG II States, and the MEVA III Service Provider.

4.2.2 The spare parts for the additional equipment to be installed at the MEVA III nodes, with REDDIG II MODEM and other device requirements, shall be purchased by MEVA III Members.

### 4.3 MAINTENANCE

4.3.1 The additional equipment that would be installed in the REDDIG II nodes and that would route communications requirements with MEVA III nodes, shall be maintained by the MEVA III Service Provider, under the coordination of the REDDIG II Administration.

4.3.2 The additional equipment that would be installed in the MEVA III node, with communications requirements with REDDIG II nodes, shall be maintained by MEVA III Member, in coordination with the REDDIG II and the MEVA III Service Provider.

#### 4.4 **SPACE SEGMENT**

4.4.1 The carriers, as well as the band width requirement for communications between REDDIG II nodes shall be the same as those currently rented with INTELSAT. The payment of the space segment to INTELSAT shall continue being carried out through the REDDIG II Administration, who shall be in charge of collecting contributions from each SAM State member of REDDIG II.

4.4.2 The carriers, as well as the band width requirement for communications between MEVA III nodes shall be done through the MEVA III Service Provider. MEVA III members shall pay the bandwidth consumption to the MEVA III Service Provider.

4.4.3 The circuits necessary for communications between a REDDIG II node having MODEMs participating in the interconnection with MEVA III shall be administrated by the MEVA III Service Provider. The amount charged for circuits used by the REDDIG II Member of the aforementioned node mentioned shall be provided by the MEVA III Service Provider, and the respective consumption payment to the provider shall be made through REDDIG II Administration.

4.4.4 The circuits necessary for communications between a MEVA III node having MODEMs participating in the interconnection with REDDIG II shall be administrated by REDDIG II. The amount charged for circuits used by the mentioned node shall be provided by the REDDIG Administration, and the respective consumption payment shall be made by the MEVA II member of the aforementioned node to the REDDIG II Administration.

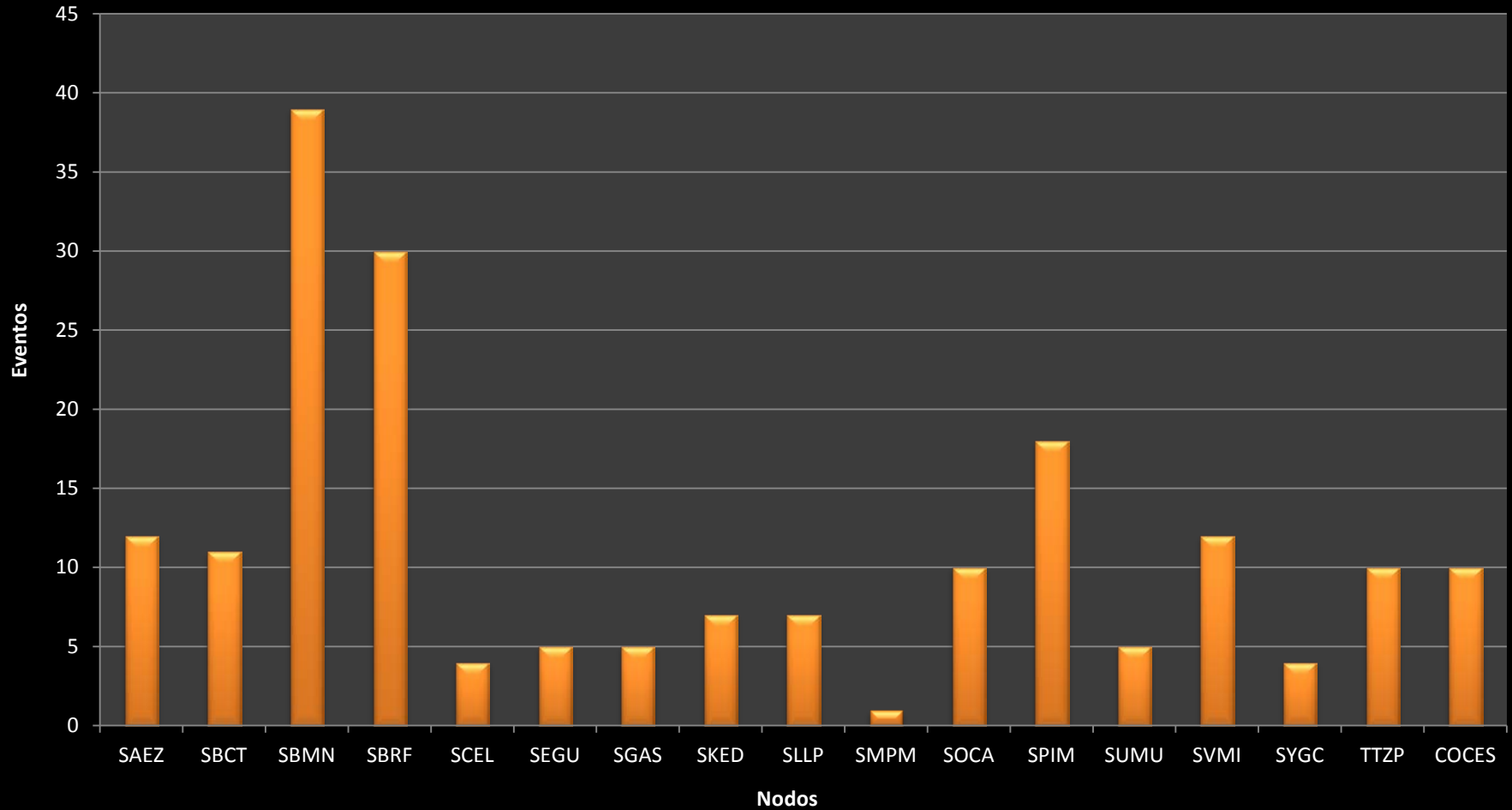
**APPENDIX I / APÉNDICE I**

**SUMMARY OF FAILURES AND PARTS - 2015  
RESUMEN DE AVERÍAS Y PARTES - 2015**

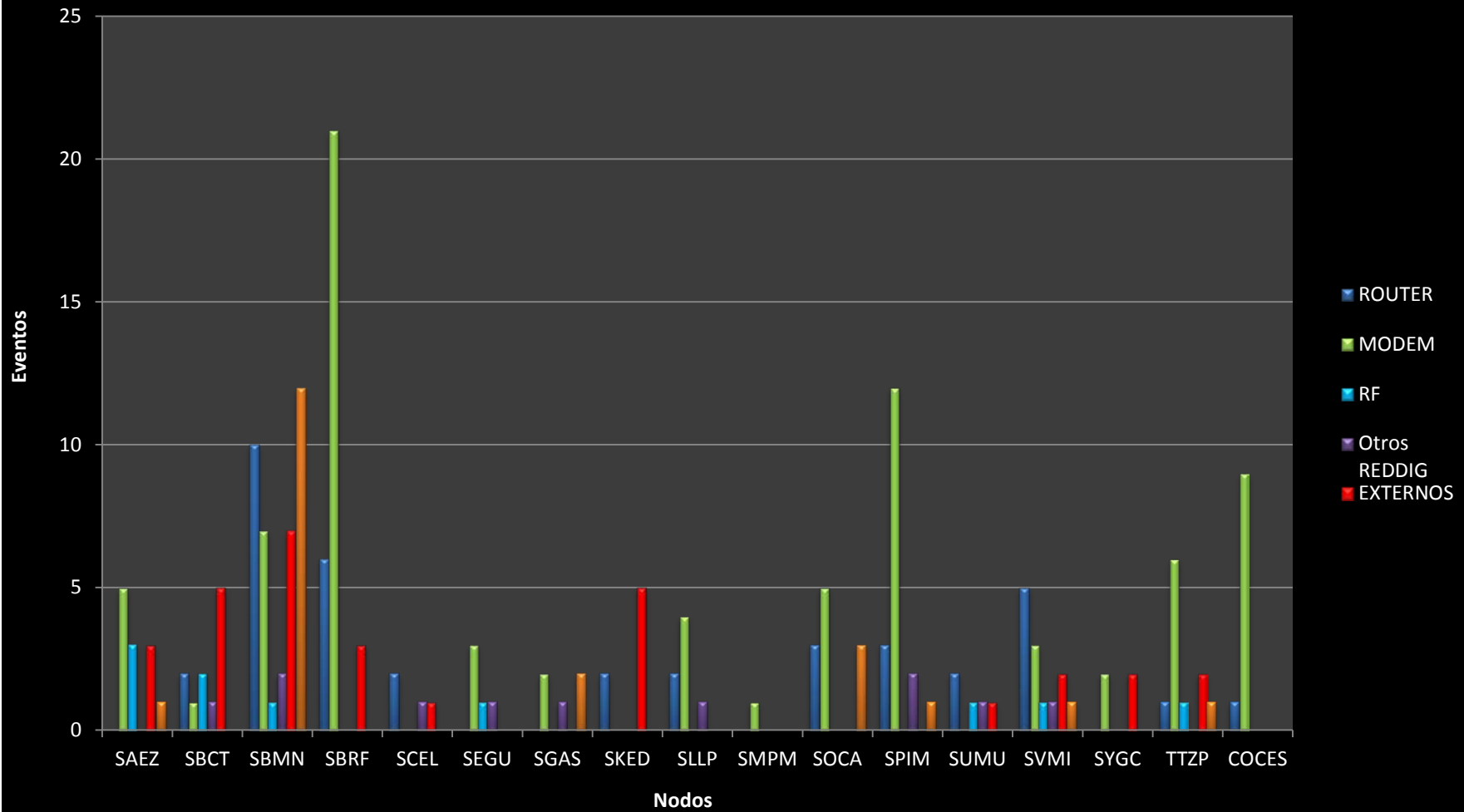
<b>MODEM</b>	Fábrica:	ND Satcom
	(1) Skywan 1070	: COCESNA
	(1) Skywan 1070	: SPIM
<b>RF</b>	Fábrica:	TERRASAT Communications, Inc.
	(1) RX Waveguide Switch	: SBCT
	(1) IBUC 80W	: SVM I
<b>Otros REDDIG</b>	Fábrica:	Gorgy Timing
	(1) GPS RTCP09	: SCEL

Nota: Todos estos equipos fueron reemplazados bajo garantía

### REDDIG 2015 Attention to Nodes / Atenciones a los Nodos =190



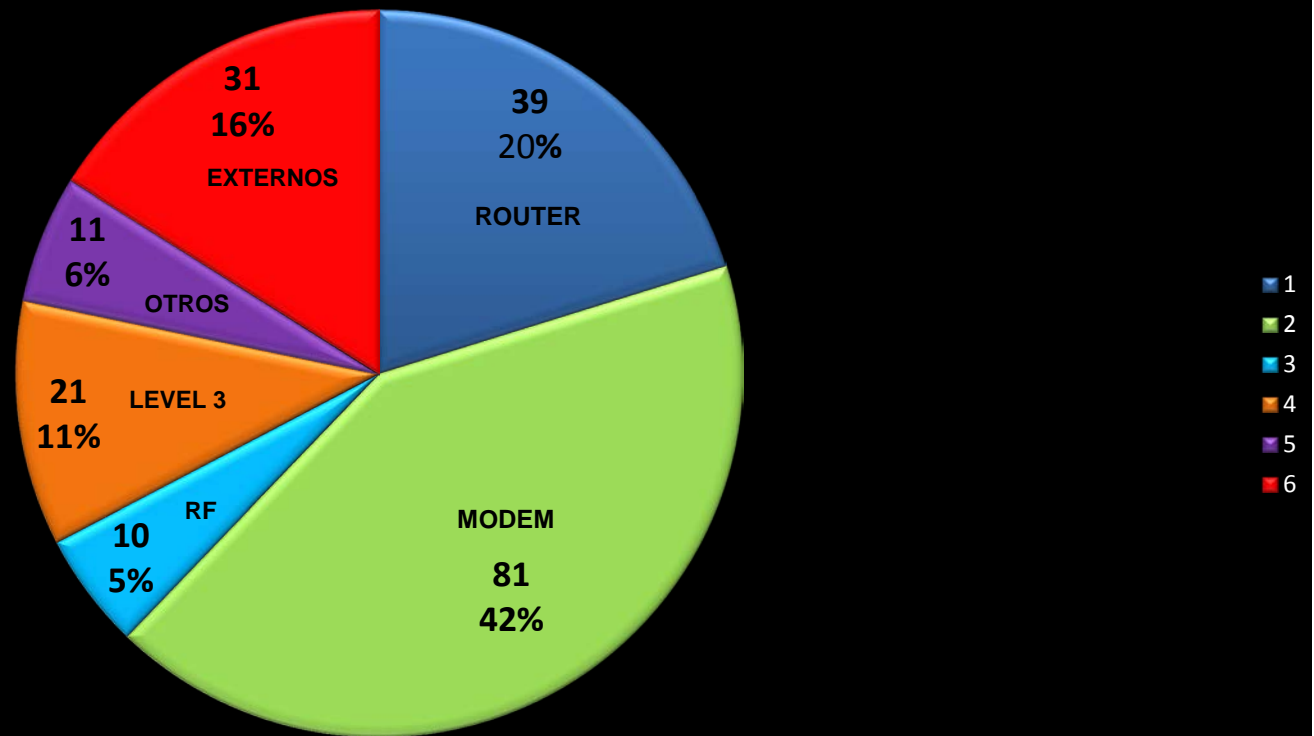
## REDDIG 2015 Distribution of Attentions / Distribución de Atenciones



### REDDIG 2015

#### Attention Distribution per Equipment Category

#### Distribución de Atención por Categoría de Equipo



# REDDIG Network Availability

## Disponibilidad REDDIG

