



Agenda Item 2: Background and work carried out to implement a new communication link between the Ezeiza ACC and Johannesburg ACC

DEPLOYMENT OF A REDDIG II NODE (MPLS) IN JOHANNESBURG

(Presented by Secretariat)

SUMMARY
This Information Paper presents the background and work done for improvement of communications between the Area Control Centres of Argentina and South Africa, in support of the provision of air navigation services by the ACC Ezeiza and ACC Johannesburg.
References:
<ul style="list-style-type: none">• Final Report of the CAFSAT Management Committee Meeting – CNMC/8 (Durban, 04-05 June 2018)• Final Report of the Project RLA/03/901 Coordination Committee Meeting – REDDIG RCC/26 (Virtual, 02-05 March 2021)

1. Background

1.1 With the aim of providing the means of communication between the Area Control Centers (ACCs) of Argentina and South Africa, with adjacent Flight Information Regions (FIRs), a station of the Central African Satellite Network (CAFSAT) was implemented in Ezeiza (Argentina).

1.2 The Ezeiza CAFSAT station provided a point-to-point link with the Johannesburg CAFSAT station, allowing the establishment of two voice circuits and one AFTN circuit. Figure 1 depicts the communications established between the two CAFSAT nodes in Argentina and South Africa.

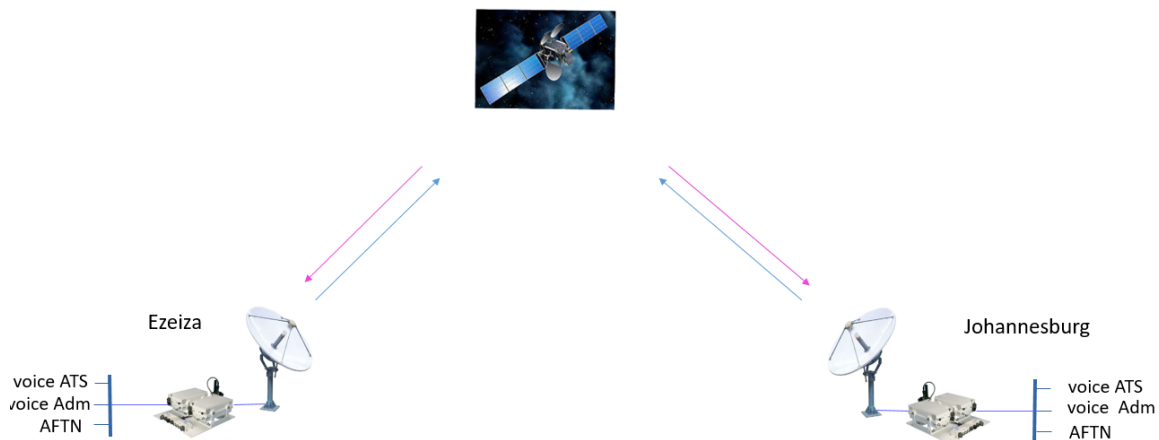


Figure 1 – CAFSAT nodes of Ezeiza and Johannesburg

1.3 During the CNMC/8 Meeting (Durban, June 04-05, 2018), Conclusion CNMC/8-7: *Guidelines for the implementation of phase II of CAFSAT stations* and Decision CNMC/8-08: *Updated Action Plan for Phase II of Reengineering of the CAFSAT Network*, for the modernization of the stations of the CAFSAT network, were formulated.

1.4 The modernization of CAFSAT stations would provide the possibility of meeting the communications requirements of the new CNS/ATM systems (AMHS, ADS, AIDC, etc.) that require greater bandwidth.

1.5 After a technical and cost/benefit analysis, the Air Navigation Service Provider of Argentina (EANA), concluded that the modernization of the CAFSAT station and the contracting of more bandwidth from the satellite provider, would not represent the best option to provide the means of communication between the ACCs of Ezeiza and Johannesburg.

1.6 To replace the links via CAFSAT, EANA has considered the implementation of an MPLS node of the SAM Region Digital Network (REDDIG II), providing a high-performance means of communication with significant technical and economic advantages.

1.7 In this regard, during the REDDIG RCC/26 Meeting (Teleconferences, 02-05 March 2021), Conclusion RCC/26-1 was formulated:

CONCLUSION RCC/26-1	IMPLEMENTATION OF REDDIG II GROUND NETWORK (MPLS) NODES IN STATES OF OTHER REGIONS
<p>The Secretariat</p> <p>Take the necessary information for the procurement and installation of REDDIG II ground network (MPLS) nodes in states in other regions, as described below:</p> <p>a) A node in Madrid (Spain) in the interest of Argentina, Brazil and Venezuela, to implement, initially, AMHS communications with the COM Center of Madrid. The cost will be shared by the three States concerned; and</p> <p>b) A node in Johannesburg, South Africa, in Argentina's interest for the establishment of voice and data communications with the FIR Johannesburg ANSP. The cost will be charged in Argentina's annual fee.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input checked="" type="checkbox"/> Interregional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Technical/Operacional</p>
<p>Why: To provide better interregional communications with African and European States, which have planned communications requirements with Participating States of the RLA/03/901 Regional Project.</p>	
<p>When: Immediately</p>	<p>Status: Approved in the RCC/26 Meeting</p>
<p>Who: <input checked="" type="checkbox"/> States <input checked="" type="checkbox"/> ICAO SAM Secretariat <input checked="" type="checkbox"/> Others: ENAIRE y ATNS</p>	

2. Proposal for implementation of a REDDIG II Node (MPLS) in Johannesburg

2.1 By means of Letter SA5176 of 19 April 2021, the ICAO South American Regional Office informed the South African Civil Aviation Authority of Argentina's intention to discontinue the

Ezeiza CAFSAT station, replacing the satellite link with a REDDIG II ground network link (MPLS), through the installation of a REDDIG II node in Johannesburg, at no cost to the South African administration. **Appendix A** to this information paper presents Letter SA5176.

2.2 In response, the Department of Transport of the Republic of South Africa appointed representatives of the South African Air Navigation Service Provider (ATNS) to discuss the details of the REDDIG II node implementation in Johannesburg and the updating of the Letter of Procedures between the Ezeiza and Johannesburg ACCs. **Appendix B** to this information paper presents the letter from the South African Civil Aviation Authority.

2.3 Within the framework of the Regional Technical Cooperation Project RLA/03/901, ICAO representing the participating States of the Project contracts the provision of communication links for REDDIG II network. In order to implement the Johannesburg node, ICAO has contracted the installation and services for a link with the following characteristics:

- 5 Mbps bandwidth;
- Monthly circuit availability of 99.7 %;
- The Round-trip time (RTT) for communications between the two stations, for a 64-byte packet, may not exceed 150ms in 95% of the measurements made in a minimum time window of 10 seconds; and
- The bit error rate (BER) shall be less than 10⁻⁷, 99.5% of the time.

2.4 Figure 2 depicts the concept of REDDIG II node deployment in Johannesburg.

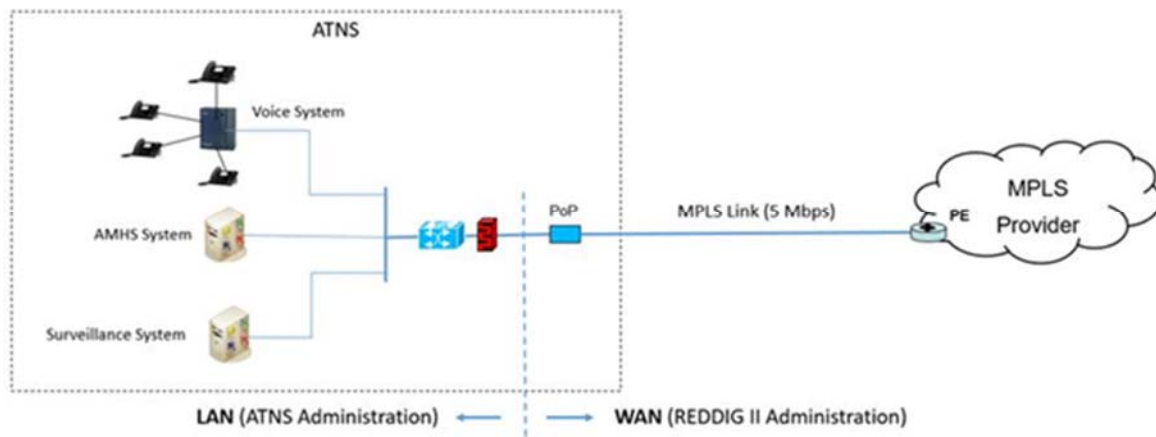


Figure 2 – Concept of REDDIG II node deployment in Johannesburg

2.5 In order to formalize the implementation of the REDDIG II node in Johannesburg, representatives of ATNS and EANA, with the support of the ICAO ESAF and SAM Regional Offices, prepared and signed a Technical Agreement Letter, which is presented in **Appendix C** to this information paper.

3. Conclusion

3.1 The implementation of the REDDIG II node in Johannesburg, in addition to improving communications with Argentina, allows South Africa to connect, through the same link, with any node of the network that has any communication requirement. Figure 3 presents the REDDIG II topology, including the new planned nodes.

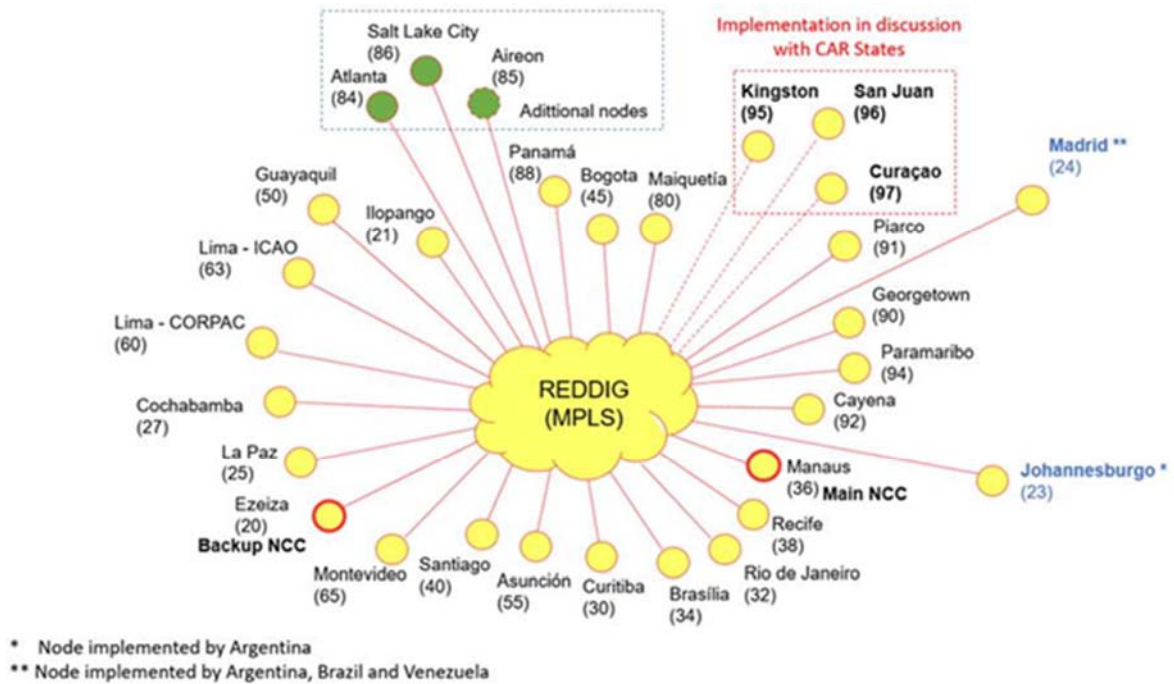


Figure 3 – REDDIG II topology

3.2 Using the same link, the Johannesburg ACC will be able to communicate with the Atlantic ACC (Brazil), the Montevideo ACC (Uruguay), which it has FIRs adjacency, as well as with any other participating node of the network.

3.3 For the establishment of new communications between the REDDIG II nodes, it is only necessary to coordinate, through the ICAO South American Office, with the Network Administrator at the Network Control Center (NCC) in Manaus (Brazil), who will provide the necessary configurations.

3.4 Surely, the initiative to implement a REDDIG II node in Johannesburg will meet the future requirements of aeronautical communications, including the SWIM concept, providing a significant improvement in the provision of air navigation services and, consequently, an increase in operational safety.

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International
Civil Aviation
Organization

Organisation
de l'aviation civile
internationale

Organización
de Aviación Civil
Internacional

Международная
организация
гражданской
авиации

منظمة الطيران
المدني الدولي

国际民用
航空组织

Ref.: LN3/20.2.13 – SA5176

Lima, 19 April 2021

Ms. Poppy Khoza
Director
SACAA

Subject: **RLA/03/901 - REDDIG Management System and Satellite Segment Administration**
Implementation of REDDIG II Ground Network (MPLS) Node in Johannesburg, South Africa

Dear Madam:

I wish to refer to the REDDIG II South American Regional Project to inform you that Argentina's air navigation service provider (EANA), through the attached letter, has expressed their intention to discontinue the VSAT station of the CAFSAT network in Ezeiza, replacing communication links with an MPLS link from the REDDIG II Network (SAM Region Digital Network).

In this regard, during the Twenty-sixth Meeting of the Coordination Committee of the RLA/03/901 Regional Project, Conclusion RCC/26-1 was adopted, for the implementation of a REDDIG II node in Johannesburg, if the proposal is accepted by the South African administration.

CONCLUSION RCC/26-1	IMPLEMENTATION OF REDDIG II GROUND NETWORK (MPLS) NODES IN STATES OF OTHER REGIONS
<p>The Secretariat</p> <p>Take the necessary information for the procurement and installation of REDDIG II ground network (MPLS) nodes in states in other regions, as described below:</p> <p>a) A node in Madrid (Spain) in the interest of Argentina, Brazil and Venezuela, to implement, initially, AMHS communications with the COM Center of Madrid. The cost will be shared by the three States concerned; and</p> <p>b) A node in Johannesburg, South Africa, in Argentina's interest for the establishment of voice and data communications with the FIR Johannesburg ANSP. The cost will be charged in Argentina's annual fee.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input checked="" type="checkbox"/> Interregional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Technical/Operational</p>
<p>Why: To provide better interregional communications with African and European States, which have planned communications requirements with Participating States of the RLA/03/901 Regional Project.</p>	
<p>When: Inmediatly</p>	<p>Status: Approved in the RCC/26 Meeting</p>
<p>Who: <input checked="" type="checkbox"/> States <input checked="" type="checkbox"/> ICAO SAM Secretariat <input checked="" type="checkbox"/> Others: ENAIRE y ATNS</p>	

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- 2 -

The proposal consists of the installation of a REDDIG II ground network node (MPLS) in Johannesburg, with EANA being responsible for non-recurring costs – NRC (installation) and monthly recurring costs – MRC (service), with the following characteristics:

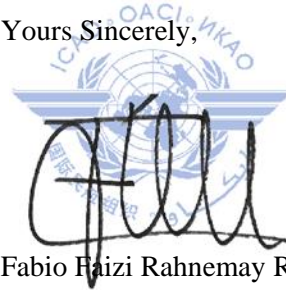
- Link of 5 Mbps bandwidth;
- Monthly availability of 99.7 %;
- The RTT for communications between the two stations, for a 64-byte packet, may not exceed 150ms in 95% of the measurements made in a minimum time window of 10 seconds; and
- The bit error rate (BER) shall be less than 10⁻⁷, 99.5% of the time.

As a suggestion, it is indicated to undertake an ATM/CNS Informal Bilateral Meeting between Argentina and South Africa for the signing of a Memorandum of Understanding (MoU) and the Letter of Agreement (LoA) establishing new communication requirements and air navigation procedures between the two States. The Regional Offices would support the States to carry out this event.

If further clarification is needed, please contact Mr. Francisco Almeida da Silva - SAM Office CNS Officer, falmeida@icao.int, +51 977 814 722.

Accept, Madam, the assurance of my highest consideration.

Yours Sincerely,

The image shows a handwritten signature in black ink over a circular blue stamp. The stamp contains the ICAO logo, which includes a globe and the text 'ICAO OACI ICAO' at the top and 'ORGANISATION DE L'AVIATION INTERNATIONALE' at the bottom. The signature is written in a cursive style.

Fabio Faizi Rahnemay Rabbani
Regional Director
ICAO South American Office
Lima

Attachment

As indicated



transport

Department:
Transport
REPUBLIC OF SOUTH AFRICA



Forum Building, 159 Struben Street, Pretoria, 0001, Private Bag X193, Pretoria, 0001 Tel: (012) 309 3000

**ICAO Regional Director
South American Office
San Isidro
Lima 15073
PERU**

Ref: **Karen Naidoo**
Tel: **27 12 309 3528**
Email: **Multilateral@dot.gov.za**

**RLA/03/901 - REDDIG MANAGEMENT SYSTEM AND SATELLITE SEGMENT
ADMINISTRATION
IMPLEMENTATION OF REDDIG II GROUND NETWORK (MPLS) NODE IN
JOHANNESBURG, SOUTH AFRICA**

The Department of Transport of the Republic of South Africa presents its compliments to the International Civil Aviation Organization (ICAO) and has the honour to refer to State Letter Ref: LN 3/20.2.13-SA5176 dated 19 April 2021.

Kindly note that the Air Traffic and Navigation Services (ATNS) and Argentina's air navigation service provider (EANA) has commenced in dialogue on the following matters:

- a) Technical performance, design, integration and interoperability between the ATS/DS as well as AMHS systems; and
- b) Requirements for a bi-lateral meeting to conclude the required Memorandum of Understanding and Letter of Procedure as it relates to the services.

ATNS planned for a technical interface review meeting in July 2021 to finalise the interfaces and agree on the installation and commissioning timelines.

The ATNS Technical contact for these engagement are Mr. C Gersbach (CarelG@atns.co.za) and the contact for Operational engagement are Mr. S Nkabinde (SibusisoN@atns.co.za).

The Department of Transport of the Republic of South Africa avails itself of the opportunity to renew to the International Civil Aviation Organization the assurances of its highest consideration.

Yours Sincerely,

MS KAREN NAIDOO
DIRECTOR: AVIATION MULTILATERAL AFFAIRS
DATE: 26-08-2021

**Technical Letter of Agreement between
Empresa Argentina de Navegación Aérea (EANA)
and
Air Traffic and Navigation Services SOC Limited (ATNS)**

**PROCEDURES FOR COORDINATING IMPLEMENTATION OF A
REDDIG II NODE (MPLS) UNDER THE FRAMEWORK OF
THE REGIONAL TECHNICAL COOPERATION PROJECT RLA/03/901**

EFFECTIVE NOVEMBER 24th, 2021

The Air Navigation Service Providers of Argentina (EANA) and South Africa (ATNS) wish to cooperate with each other on technical and procedural arrangements associated with the implementation of a node of the terrestrial SAM Digital Network (REDDIG II) through a Multi-Protocol Label Switching (MPLS) provider, used for Air Traffic communication services. The objective is to establish communications to support the requirements for air navigation services and coordination between the Flight Information Regions under responsibilities of both ANSP, using a technically improved infrastructure, which provides superior service. The node will be implemented by Argentina, as a participant State to the Regional Technical Cooperation Project RLA/03/901, at no expense to the South Africa air navigation service provider (ATNS).

I - PURPOSE

This Technical Letter of Agreement (LoA) identifies and defines the procedures by which each party intends to provide and maintain the connection of the ATNS facilities in Johannesburg to the SAM Digital Network (REDDIG II) administered by the International Civil Aviation Organization (ICAO) South America (SAM) Regional Office. Argentina represented by EANA, as a participant of the ICAO's Regional Technical Cooperation Project RLA/03/901 has proposed and South Africa, represented by ATNS, has agreed to implement this connection to improve aeronautical communications between the Ezeiza and Johannesburg FIRs.

Both parties firmly believe that the implementation of this service will better support the air navigation services provided in the South Atlantic airspace under responsibility of ATNS and EANA, by improving the distribution of aeronautical messages and ATS coordination between the participating States.

II- SERVICE LOCATION

The following is designated as service location, for the purpose of this Technical LoA:

ATNS Air Traffic Control Centre
O. R. Tambo International Airport Gate 14
Bonaero Drive

Bonaero Park
Kempton Park
1622
Tel: +27 11 928 6477
E-mail: frc@atns.co.za

III – PROCESS AND PROCEDURAL RESPONSIBILITIES

A. SERVICES

1. Through the Regional Technical Cooperation Project RLA/03/901, EANA requested the ICAO SAM Regional Office and has provided the necessary resources for installation of a REDDIG II terrestrial network node (MPLS) in Johannesburg.
2. The SAM Regional Office with support of the Technical Cooperation Bureau (TCB) will take the necessary measures to amend the Contract 22502088 with Lumen (former CenturyLink), in order to install a REDDIG II MPLS node in Johannesburg, with the following characteristic:
 - a) 5 Mbps bandwidth link;
 - b) 99.7 % for monthly availability;
 - c) The RTT for communications between the two stations, for a 64-byte packet, may not exceed 150 ms in 95 % of the measurements made in a minimum time window of 10 seconds; and
 - d) The bit error rate (BER) shall be less than 10^{-7} , 99.5% of the time.
3. The telecommunication service provider (Lumen) will install the Point of Presence (PoP) in an ATNS facility, providing the necessary equipment, including a Customer Premises Equipment (CPE) with at least two standard Gigabit Ethernet interfaces.
4. With anticipation of at least 15 days, the telecom provider representative must contact the ATNS Technical Focal Point to schedule the node installation.
5. ATNS shall:
 - a) Provide the physical space for the installation of cabinets and equipment.
 - b) Deliver to the premises the electric power required and grounding system.
 - c) Maintain adequate environmental conditions (temperature, humidity, etc.) in the local where the PoP will be installed.
 - d) Obtain all necessary authorization and assist the telecom provider representatives in the installation process of the node.

B. IMPLEMENTATION OF THE CIRCUITS AND SCHEDULING

1. The following communications will be implemented:
 - a) Voice circuit for ATS purpose (Ezeiza ACC – Johannesburg ACC);
 - b) Voice circuit for Administrative/Maintenance service;
 - c) AMHS (P1) interconnection (Ezeiza – Johannesburg COM Centers);
 - d) Data circuit for surveillance purpose deemed necessary in the future; and;

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- e) Other communications deemed necessary in the future, including communications with other States/Organizations participant of the network.
2. The REDDIG II Administrator will coordinate the configuration of the Johannesburg node (CPE) and the establishment of all communications agreed.
3. The router to be installed as CPE is the limit point dividing the Wide Area Network service, under responsibility of the REDDIG II Administrator, and the Local Area Network service, under responsibility of ATNS Technical Personnel.
4. ATNS must provide the cabling infrastructure to connect the local systems to the REDDIG II node in Johannesburg. The connection of the local systems of Johannesburg to the REDDIG II node will be through standard Gigabit Ethernet ports.
5. Following the successful implementation of the node, migration of services will be scheduled in coordination with the REDDIG II Administrator.
6. The previous communications via CAFSAT network between Argentina and South Africa will be discontinued.

C. MAINTENANCE AND RESTORATION OF SERVICE

1. ATNS and EANA are obligated to notify each other at least thirty (30) days prior to making any changes to their portion of the service that will affect the operations and service between the two parties.
2. ATNS and EANA will coordinate with each other to minimize anticipated interruptions of service and unnecessary engineering modifications to the service.
3. ICAO is responsible for maintaining the contract with the vendor associated with the service. The ATNS and EANA intend to coordinate with ICAO and each other, for their respective maintenance and operational activities affecting the network and associated system service in advance.
4. When the REDDIG II administration determines a networking problem is associated with a disruption, the network administrator shall notify the parties Technical Focal Point as soon as possible.
5. Outages affecting the network will be reported to both parties as soon as practical to do so. The restoration time for service shall be in accordance with the service provider maintenance manual and contract obligation.
6. The 24-hour single point of contact for all coordination regarding the service is:

ATNS: ATNS Fault Reporting Centre
 O. R. Tambo International Airport Gate 14, Bonaero Drive, Bonaero Park, Kempton
 Park, 1622
 Tel: +27 11 928 6477
 E-mail: frc@atns.co.za

EANA: Centro de Comunicaciones Digitales (CECODI)
Ministro Pistarini International Airport - Ezeiza
AU Tte. Gral. Pablo Riccheri Km 33,5, Puerta 50, 4to piso
Tel: + 54 11 4480 2362
Cel: +54 9 11 3156 3055
E-mail: cecodi@eana.com.ar

REDDIG Network Control Center (NCC) REDDIG in Manaus-Brazil
Administrator: CINDACTA IV Av. do Turismo 1350,
Tarumã - CEP 69045-630
Manaus, AM - Brazil
Tel: +55 92 3652 5713 / +55 92 3652 5712
E-mail: jvittor@icao.int

IV – FINANCIAL PROVISIONING

A. Expenditures

1. EANA shall bear the cost of providing MPLS services at a bandwidth rate of 5 Mbps, by means of the Regional Technical Cooperation Project RLA/03/901. The Technical Cooperation Bureau (TCB) will make the necessary arrangements to amend the current contract with the REDDIG II telecommunication provider (Lumen), in order to install and provide service for the Johannesburg node.
2. ATNS shall not incur any additional expenses associated with the establishment of the service for the duration of the agreement.
3. Nothing contained in this Technical LoA shall constitute a waiver of ICAO's privileges and immunities, and, as between ICAO and all REDDIG Participating States, ICAO shall be held harmless from all claims or liability of any kind.

V - AMENDMENTS

This Technical Letter of Agreement will be in effect until December 31, 2024.

This Technical LoA may be amended by mutual written agreement.

The coordination points between ATNS and EANA for any required amendments to this Technical LoA are designated as follows:

ATNS: Carel Gersbach
Senior Manager - Technical Planning and Quality
Address: Eastgate Office Park Private Bag X15
Block C, Kempton Park, South Boulevard Road 1620,
Gauteng, Republic of South Africa

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Tel: +27 11 607 1000
Email: carelg@atns.co.za

EANA:

Malena Reinoso
CNS Engineering Manager
Address: Florida 361, piso 2º, C1005AAG Buenos Aires Argentina
Tel: +54 9 11 3205 9071
Email: mreinoso@eana.com.ar


VI – CONFIDENTIALITY & PROPRIETARY INFORMATION

Both parties undertake not to use or reveal to any third party any proprietary or confidential information about the other party unless required to by law or unless it is necessary to do so to provide the services.

The ATNS and EANA agree to the provisions of this agreement as indicated by the signatures of the duly authorized representatives below.



Mr. Facundo Gatti
Chief Technology Officer
Empresa Argentina de Navegación Aérea S.E.



Mr. Richard Madlala
Chief Technology Officer
Air Traffic and Navigation Services SOC Ltd

Date 24-NOV-2021

Date 24 November 2021