

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Regional Office**

**UNDP/ICAO REGIONAL PROJECT RLA/98/019
IMPLEMENTATION OF THE SOUTH AMERICAN DIGITAL NETWORK (REDDIG)**

SIXTH MEETING OF THE COORDINATION COMMITTEE (RCC/6)

(Lima, Peru, 20 – 21 November 2003)

Agenda item 4: Analysis of the situation of implementation of the REDDIG and considerations about the closure of project RLA/98/019

PENDING TECHNICAL ASPECTS RELATIVE TO THE IMPLEMENTATION OF THE REDDIG

(Paper presented by the Secretariat)

Summary

This working paper presents a summary of the pending technical aspects relative to the implementation of the South American Digital Network REDDIG, under regional project RLA/98/019, as well as other important aspects related to the project progress.

1. Introduction

1.1 Regional project RLA/98/019 was activated to implement the REDDIG South American Digital Network and to manage this network for the initial period of six months. In this sense, this project has two clear well-defined objectives. Regarding the implementation of the REDDIG, the network is presently under operation, although there are still some pending issues that will be described below. Regarding the network administration, this is being carried out from the Lima NCC, and will continue with this management within the new project RLA/03/901.

2. Pending issues regarding the REDDIG implementation

2.1 Backup network

2.1.1 During the RCC/5 a configuration scheme for the backup network was presented. This configuration was conformed by ISDN backup circuits, leased line V.35, and VPN (IP) circuits.

2.1.2 On that date, only six nodes had ISDN lines installed as backup circuits. Presently, eight nodes with ISDN lines are available. Nodes with ISDN circuit as backup are: Buenos Aires, Bogota, Curitiba, Lima, Manaus, Montevideo, Recife and Cayenne.

2.1.3 In **Appendix A** to this working paper, information referred to the ISDN backup circuits, with their respective number, is being presented. Likewise, in **Appendix B** the topology of the backup network is being presented, designed by the project and revised by the contractor SEEE. In this topology, it is also included, as the ninth node, the REDDIG node in Santiago de Chile, which, according to the information supplied by the project, would be almost implemented. In this regard, it is expected that, during the Meeting, Chile provide information on this issue.

2.1.4 On the other hand, as indicated in WP/03, there are 4 nodes that do not present ISDN services. In this sense, V.35 digital circuits will be implemented to 64 KBPS in Maiquetia-Guayaquil and La Paz-Asuncion as backup functions for the corresponding nodes.

2.1.5 The responsibility of implementing the backup network was in charge of the contractor. Although during the NAT tests, in May 2003, the States did not provided the corresponding ISDN access, the contractor did not programmed the Backup Network. In this moment, the project is coordinating with SEEE to implement a database considering the backup programming as well as carrying out the corresponding tests. The contractor position in this regard is that, in this moment, this results to be an additional work that requires of the corresponding payment to be executed, which, informally, was quoted in .45,000.00 US\$. The project has the capacity of doing the work, but it is necessary that the contractor maintain the warranty on the correct operation of the network. The estimated time to carry out this work is of approximately one month.

2.1.6 On the other hand, it is important to recognize that the implementation of the backup network will facilitate the deactivation of the present AFS system, which is being used as backup of the satellite segment in the REDDIG.

2.2 **Recuperation network in case of disasters**

2.2.1 The recuperation network in case of disasters has been implemented in all the nodes. This network consists, basically, in one POTS line, dedicated to the exclusive use of the REDDIG, and connected to the dial-up MODEM of the REDDIG rack. It is important to point out that some of these lines present strong noise and low capacity for the management of data, which makes necessary to solve these problems.

2.2.2 The remote maintenance from the NCC is done through these lines, which makes necessary to count with adequate lines.

2.3 **REDDIG manual**

2.3.1 The ad-hoc group, jointly with the Project Office, elaborated a Table of Contents of the Operation and Maintenance Manual of the REDDIG, which has not yet been developed up to date.

2.3.2 After the RCC/5 meeting, contractor SEEE, upon the project request, completed the Manual "*Operation & Maintenance Manual (Edition B/B1)*", which was provided in August 2003. This manual describes:

- hardware
- software
- operation instructions

- procedures for failure detection
- cabling diagram, and
- mechanical diagram of the node.

2.3.3 Likewise, this manual is subject to necessary revisions, according the network operation.

2.3.4 Taking into account the above, it is considered convenient to present the REDDIG Manual divided in:

- a) Technical manual for the operation and maintenance of the REDDIG, it is being presented to the consideration of this meeting to use SEEE Manual “*Operation & Maintenance Manual* (Edition B/B1)” as the technical manual of the REDDIG.
- b) Operations procedures manual, which will regulate the operation of the network and will be developed and updated according to the network operation.

2.3.5 In the preparation of this Manual, procedures for the preparation of manuals recommended by the ISO9000 norm will be used, in order to prepare the ground for a future certification of a management system of the quality of the REDDIG.

2.3.6 A preliminary document is being presented in **Appendix C**, which is being submitted to consideration of the Meeting.

2.3 GNSS augmentation

2.3.1 The circuits for the GNSS augmentation platform could not be tested during the NAT, since the CAA circuits were not ready. At the present moment, some States have done the physical connection between the REDDIG node and the CSTB node, such as Brazil, which make a communications link between the CSTB master station in Rio de Janeiro and the REDDIG node in Curitiba. In Argentina, Bolivia and Peru, the reference stations are very close to the REDDIG node, and their connection to the respective REDDIG nodes have already been programmed.

2.3.2 The Aeronautical Administration of Chile is presently working in the implementation of a communications link between the International Airport Arturo Merino Benitez, in Santiago de Chile, where the CSTB master station is located, and the REDDIG node located in Cerro Colorado. Likewise, Colombia has installed in Tegucigalpa, Honduras, a VSAT station of the Colombian satellite network, which will permit carrying the information from the reference station of Honduras to the master station in Rio de Janeiro, via Bogota.

2.3.3 The Aeronautical Administration of Colombia is presently working in a communications link between the CSTB node, located in the CEA, instruction center in Bogota, and the REDDIG node located in the installations of the control center building, also in Bogotá. Likewise, it will have to multiplex its information with the information of Honduras in order to be able to carry the information from the nodes of Colombia and Honduras to Rio de Janeiro.

2.3.4 It is expected that, during the Meeting, the States involved inform on the date in which the above quoted connections will be implemented.

2.4 **Transference of the Lima NCC to Manaus**

2.4.1 This issue, considered as a pending issue, is out of the ICAO/SEEE contract scope and will be analyzed within agenda item 5 of the meeting.

2.5 **Failures of the REDDIG equipment**

2.5.1 At the present moment, equipment in different REDDIG nodes present failure, which has been documented and sent in a list to SEEE in order that, according to procedures contemplated in the contract, and in coordination with the ICAO Technical Cooperation Bureau, SEEE takes the necessary steps regarding the damaged units and proceed to the replacement, as soon as possible, of the totality of hardware/software in each node and of the network, warranting the services availability. Project RLA/03/901 will continue providing support to the REDDIG in this regard.

2.6 **Final acceptance tests**

2.6.1 Within the conditions of the ICAO/SEEE contract, the final acceptance tests (FSAT) should be carried out in accordance with a determined protocol to be agreed with SEEE. This issues will be coordinated with SEEE after the RCC/6 Meeting, and the States will be informed on the date in which these will be carried out and modality to be used..

3. **Conclusions**

3.1 The REDDIG, at the present moment, is rendering high-quality and high-efficiency communications services for AFTN and oral ATS communications, in accordance with what was contemplated in the technical specification document of the project (TSD). However, important issues delayed due to the lack of availability of necessary installations are still pending, which were supposed to be available on due time (period of the PSAT/NAT tests) to be connected to the REDDIG nodes. These installations are, for example, the access to ISDN services (backup network) and the connection for the GNSS augmentation network, which were responsibility of the States. It is expected that the Region makes progressive agreements to establish exchange of radar information (SSR), as well as concrete plans for AMHS and other earth ATN applications..

4. **Closure of Project RLA/98/019**

4.1 If the two Objectives of project RLA/98/019 are analyzed, these can be considered concluded, with the exception certain pending implementation issues mentioned above, which should have a progressive solution based on negotiations carried out with SEEE, and of the corresponding implementation of installations in the States to connect the services of the REDDIG nodes. Therefore, and according to conclusion RCC 5/1, once committed obligations are paid by the project, and ICAO Finance Section make the expenses reconciliation, remaining funds will be transferred to project RLA/03/901 and project RLA/98/019 will be closed.

5. **Suggested action**

5.1 The meeting is invited to consider the information presented in this working paper in order to:

- a) Take note that, from the technical point of view, the two Objectives of Project RLA/98/019 have been accomplished;
- b) Examine the pending issues regarding the implementation of the REDDIG, and provide, by State, the pertinent information, and to make necessary agreements to enable the solution of these issues; and
- c) Take note of the aspects related to the project closure.

- end -

APPENDIX A

REDDIG Backup Network

NODE	Country - City	Modem Line			Installed	ISDN Line			Installed
SAEZ	Argentina - Ezeiza	54	11	4480-2445	Yes	54	11	4480-0368	Yes
SBMN	Brasil - Manaus	55	926	520-708	Yes	55	926	520-709	Yes
SBCT	Brasil - Curitiba	55	41	251-5415	Yes	55	41	257-7250	Yes
SBRF	Brasil - Recife	55	81	3462-4553	Yes	55	81	3341-4234	Yes
SOCA	Guyana F. - Cayenne	594	594	359-381	Yes	594	594	391-381	Yes
SPIM	Peru - Lima	51	1	575-4888	Yes	51	1	515-3015	Yes
SUMU	Uruguay - Montevideo	598	2	604 0031	Yes	598	2	600-0953	Yes
SKED	Colombia - Bogota	57	1	413-9412	Yes	57	1	294-7230	Yes

APPENDIX B

REDDIG BACKUP NETWORK

ISDN Network Topology

NODE	ALT 1
SAEZ	SUMU
SUMU	SAEZ
SBMN	SBCT
SBCT	SBMN
SBRF	SOCA
SOCA	SBRF
SPIM	SKED
SKED	SPIM
SCEL	SPIM

Leased Line (V.35)

NODE	ALT 1
SVMI	SEGU
SEGU	SVMI
SLLP	SGAS
SGAS	SLLP

VPN (IP)

NODE	ALT 1
SMPM	SYGC
SYGC	SMPM