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INTERNATIONAL CIVIL AVIATION ORGANIZATION

Seventh Meeting of the Civil Aviation Authorities of the SAM Region (RAAC/7)

(Salvador, Bahia, Brasil, 01 to 03 July 2002)

Agenda Item 4: Transition to the CNS/ATM systems

b) Multinational systems and services – South American Digital Network (REDDIG)

REGIONAL TECHNICAL COOPERATION PROJECT RLA/98/019-SOUTH AMERICAN DIGITAL NETWORK (REDDIG)

(presented by the Secretariat)

Summary

This working paper contains information about the implementation of the South American Digital Network (REDDIG) under the regional technical cooperation project RLA/98/019, focusing institutional aspects to be developed for the completion of the final agreement that will clearly establish the operation, maintenance and control of the network as a multinational system.

References:

- CAR/SAM Regional Air Navigation Plan (FASID and Basic ANP);
- GREPECAS/6 meeting report;
- GREPECAS/10 meeting report;
- RAN CAR/SAM/3 meeting report (Doc. 9749);
- RAAC/6 meeting report;
- UNDP/ICAO RLA/98/019 Project Document;
- REDDIG/3 meeting report; and
- REDDIG/4 meeting report.

1. **Background**

The REDDIG as an open communication architecture for the SAM Region

1.1 The concept of the South American Digital Network (REDDIG) has evolved since it was first discussed by the AFTN/ATN Task Force of the former GREPECAS Communications Subgroup, in keeping with the trends of digital network technology developments. The discussions on the REDDIG, which started in 1995 at REDDIG meetings were supported by the GREPECAS mechanism (Conclusion 6/27) and by the RAAC/6 meeting (Conclusion 6/10). REDDIG has the multi-protocol/multi-service digital network open architecture required by the reality of the ICAO SAM Region and to meet present and future requirements recommended in the ICAO CAR/SAM Air Navigation Plan for aeronautical fixed service communications.

1.2 The REDDIG will be implemented through an administrative agreement between ICAO and the States, contained in the UNDP/ICAO RLA/98/019 regional project document, which stipulates that, through the collective funding provided by the participating SAM States (except Panama), the following shall be provided:

a) consulting services by full-time experts for a period of two years;
b) management of the project by ICAO, as the executing agency;
c) drafting of network specifications, international tender documents, selection of and negotiation with the potential contractor;
d) provision, installation, test and commissioning of the network;
e) training in network hardware and software for the States' technical personnel;
f) six months of network operation, with the satellite segment paid for one year; and
g) study of proposals for the most suitable institutional arrangement for the future management and administration of the Network.

1.3 The Network will use initially as a primary means, satellite communications (PanamSat PAS-1R satellite) with a ground-based back-up (*via* public networks) in the event that the satellite segment fails. The Network will provide the user with highly reliable and efficient voice and data communication services in its 15 nodes (initial topology). Its capacity can be expanded with flexibility, and its configuration is fully redundant to offer high availability (99.993 %). The user States may connect user systems such as AFTN, ATN, PABX, RDP, FDP, etc. to the nodes of the REDDIG for the implementation of messaging applications, speech communications, radar data exchange, ATN applications (AMHS, AIDC, etc.). Coordinations are being established with MEVA to make the MEVA II version of this Network a "sister@ of the REDDIG and thus simulate a homogeneous network environment for easy interconnection of the CAR/SAM network environments. A network node must be understood to be the autonomous hardware/software system integrated to the network management system, in which transmission, switching and addressing services to data packets are provided for all types of communications required by the user systems connected to the node.

1.4 Based on the current status of implementation of the REDDIG, which is in the node installation stage, the network is expected to be operational in December 2002.

1.5 In the future, when the VDL air-ground sub-networks are developed, it will serve as a ground-based means of networking with the various VDL sub-networks implemented at the ACCs as part of ATM automation for applications such as CPDLC and ADS.

2. Institutional matters related to the REDDIG

2.1 From the viewpoint of institutional aspects, the REDDIG, which was developed to respond to meet the requirements of the ICAO CNS/ATM systems for the SAM Region, contains agreements for its implementation and for the development, in the near future, of a final agreement concerning its operation, control, ownership and maintenance. These initial agreements are outlined in the RLA/98/019 regional technical cooperation project document and in the conclusions of the REDDIG/4 meeting. As stated below, the final agreements could adopt the modality foreseen for the implementation of multinational facilities to support the implementation of the ICAO CNS/ATM systems. In this sense, it should be noted that the REDDIG concept will permit regional sharing of extensive and modern communication resources and network management systems within a geographical area that extends beyond the territories of individual States. The purpose of this is to comply with the recommendations contained in the CAR/SAM FASID, to benefit from a cost-efficient operation of communications and to have in place a digital information transmission platform that could serve as a basis for the future implementation of systems and services that could also apply the concept of multinational facilities/services.

2.1.1 WP/7 lists various systems which may be subject to institutional considerations for implementation as multinational facilities/services, supported by the REDDIG digital communication platform.

2.1.2 In this respect, it should be recognised that the REDDIG (and other similar digital networks) provide communication resources (network resources) for the distributed processing of information, a vital aspect in the implementation of the ICAO CNS/ATM systems. Consequently, it is also important to recognise that multi-protocol/multi-service open architecture digital communication network projects should serve as a basis for the implementation of other multinational facilities/services required by States. In this respect, the successful implementation of multinational multi-service/multi-protocol digital network systems will guarantee the successful implementation of other multinational systems related to digital network environments.

2.2 More than a network, the REDDIG, whose development was supported by GREPECAS and the RAAC/6 meeting, is a communication architecture concept in line with the ICAO CNS/ATM implementation concept. It was established before GREPECAS approved the General Guidelines for the Establishment and Provision of Multinational Facilities/Services (see Appendix A to WP/7). However, the implementation of the REDDIG is in line with these guidelines. In this respect, and in light of paragraph 3.3.6.3 B) of the aforementioned Guidelines, the following comments on the current REDDIG implementation process are submitted to the consideration of the meeting:

Paragraph 3.3.6.3 B) . . . .

a) ***Purpose of the proposal and operational and technical justification***

The REDDIG is a multi-protocol/multi-service network that will be implemented to meet current and future needs of aeronautical fixed communication services to support the implementation of the ICAO CNS/ATM systems in the SAM Region. Its commissioning will permit the systematic implementation of the Air Navigation Plan and provide communication support to other multinational services.

b) ***Financial implications and cost-benefit ratio***

Regional Project RLA/98/019 relies on the collective funding provided by the States at an estimated cost of US$ 5'000,000.00. This amount covers the drafting of specifications, the tender, negotiations, contracting, consulting services during network implementation, the cost of the satellite segment, six months of operations and the study of the final technical and administrative management system for the network environment. The cost-benefit analysis showed the high feasibility of the network implementation. The implementation and operation of the REDDIG is not expected to have any repercussions on user charges.

c) ***Managerial implications***

The study on the technical and administrative management of the network to be delivered by the project is also expected to provide the operational, maintenance and cost distribution structure of the network environment. To this end, an Institutional Agreement should be established, using as a reference the guidelines contained in paragraph 3.3.8 of Appendix A to WP/7.

d) ***Alternate solutions***

This is not applicable, since the REDDIG was developed before GREPECAS approved the aforementioned General Guidelines.

2.2.1 As can be readily seen, although the REDDIG was not implemented on the basis of the aforementioned General Guidelines, its implementation process may be considered to be consistent with said guidelines. It should also be noted that, from the point of view of the network technical management mechanism and its administration, the study to be conducted under Regional Project RLA/98/019 is pending of execution. In this respect, and in order to fulfil this task, the General Guidelines on multinational systems could be used as a reference. The meeting could consider the formulation of the following conclusion:

CONCLUSION 7/X- AGREEMENT FOR THE TECHNICAL AND ADMINISTRATIVE MANAGEMENT OF THE REDDIG

That the Regional Project RLA/98/019 and OACI, as the project executing body, when drafting the REDDIG Technical Management and Administration Agreement, use the relevant section of the guidelines on the establishment of multinational facilities and services developed by the CAR/SAM/3 RAN meeting and updated by GREPECAS.

2.3 Another important matter is that the future platform of the REDDIG will be effective for approximately 10 years. In this respect, the future multinational systems that will use this architecture can be implemented in a gradual and flexible way, according to the plans of each State and in line with CNS/ATM implementation principles.

3. Suggested action

3.1 The meeting is invited to take note of the information presented in this working paper in order to consider measures that will support the development of the REDDIG, so as to guarantee its successful implementation and, especially, the development of the Agreement for the future Technical and Administrative Management of the Network. In this sense, the meeting, *inter alia*, could consider the formulation of the conclusion suggested in paragraph 2.2.1 above.

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