
Agenda Item 2: Review of the technical specifications for the SAM digital network (REDDIG)

2.1 Under this Agenda item and in keeping with Activity 1.1. of the RLA/98/019 Regional Technical Cooperation Project document, the meeting thoroughly examined the draft Technical Specifications for the South American Digital Network prepared by the aforementioned Project. The meeting, in so doing, was aware of the importance of this matter, since the definitive technical specifications, with which ICAO would implement the digital network, would be those approved by the meeting based on the draft technical specifications cited above. The examination of the draft document took up 50% of the time available to the meeting for its deliberations and resulted in the amendments of some paragraphs of the document, as shown at **Appendix A** to this part of the Summary. In order to allow ICAO to prepare the definite technical specifications for the South American Digital Network (REDDIG), the meeting formulated the following Conclusion:

Conclusion REDDIG 4.4- Definite technical specifications for the implementation of the REDDIG

That ICAO, based on the material presented in Appendix A to this part of the Summary of Discussions and Conclusions, make the corresponding amendments to the draft REDDIG technical specifications prepared by the RLA/98/019 Project and develop the definite technical specifications for its implementation.

2.2 As the meeting progressed in the review of the draft technical specifications, important discussions took place with respect to the following matters:

- a) Definition of the space segment;
- b) Satellite access techniques;
- c) Domestic circuits and ISDN backup network/dedicated line;
- d) Training;
- e) Counterpart experts; and
- f) Spare parts and maintenance level.

Definition of the space segment

2.2.1 With regard to the space segment, the meeting received a broad explanation as to the advantages of using INTELSAT satellites vis-à-vis those satellites from other providers. In this regard, note was taken of the geostationary satellite constellation over the Atlantic Ocean, and to the existing warranty of service continuity based on a guaranteed space segment backup. The meeting also took note of the advantages to be derived from the use of INTELSAT IX satellites, soon to be launched into a geostationary orbit.

2.2.1.1 The meeting examined the proposal of using the IS 903 satellite, to be commissioned in June 2001. The possibility of using Series VIII operational satellites was proposed which, among other things, would facilitate the during site-survey, signal level measurements and the identification of potential in band interference risks, necessary conditions for the design of the system. The meeting noted that, in accordance with recommendation ITU-R IS.847-1, this was not necessary and that the system could be designed without a requirement for an operational satellite. On the other hand, note was taken of the great advantage of the IS 903 over INTELSAT Series VIII satellites, due to the additional 5 dBW e.i.r.p. that this satellite hemispheric beam would have, resulting in substantial savings in the price of the ground stations. On the other hand, with regard to INTELSAT 805, note was taken that no space segment was currently available in the bandwidth that REDDIG required. One State indicated that, since it made use of INTELSAT 801, it had considered that REDDIG could use said satellite, but further considerations on this subject, in the light of regional interests, lead to the conclusion that the advantages of the IS 903 for the Region should be taken into account for the REDDIG design. In summary, the meeting agreed that satellite IS 903 should be used and, in the event that this capacity were not available, the tender must realize all the link budgets computations for this beam, as well as other hemispheric beams of INTELSAT, that the tender considers as a good alternative with the e.i.r.p. values according with those of the Table of paragraph 3.2.1.4 of the technical specifications.

Satellite access technique

2.2.2 Regarding techniques to access the space segment, the meeting took note that access methods MCPC or TDMA had been considered to meet the specifications of the satellite physical media. The meeting agreed that a very efficient use of the frequency spectrum could be achieved with these access methods, resulting in a smaller bandwidth as compared to other available access methods. In this sense and at the request of one State, the meeting examined the possibility of considering the SCPC access method and concluded that, for the purposes of the REDDIG and the services considered therein, this access method would involve the use of a band width much greater than with MCPC or TDMA, with the resulting increase in the recurrent cost of the space segment which could, in the medium term, be quite a significant amount. Likewise, it was noted that a ground station with SCPC access would imply a much higher cost for the radio frequency equipment, and that it offered no advantage whatsoever vis-à-vis the options envisaged in the draft technical specifications. Therefore, the use of the SCPC access method was discarded.

2.2.2.1 The meeting also examined the bandwidth to be used by the nodes with respect to the total required REDDIG space segment bandwidth. In this regard, it was noted that each node will use a different portion of the available bandwidth, based on the traffic communications requirements of the node. As a result, the cost of the space segment per node will vary in each case and the charges should be made proportionally.

Domestic circuits and ISDN backup network/dedicated line

2.2.3 The meeting took note that in order to maintain the quality of speech communications (Rec. ITU-T G.114), the operational units having these communication requirements and which are not located at the REDDIG node sites should be connected to the REDDIG nodes through domestic ground circuits. Since these circuits will be part of the REDDIG, their transmission plan should be in keeping with that established for the REDDIG nodes, according to recommendations ITU-T G.101 and G.171. The meeting noted that the terrestrial connections of some operational units to the corresponding nodes are not for the time being available.

2.2.3.1 The meeting also noted that the REDDIG backup network required ISDN access or a dedicated circuit to be established with another node. In this regard, it was suggested that, within the activities of the Project, consideration be given to the leasing of these elements in view of the difficulties that some States would have to deliver these installations on time. The meeting examined this subject and recognized the difficulties that the RLA/98/019 Project might have in the coordination with all the communication providers in the Region for the establishment of these circuits. Such coordination could be done more easily and directly by each State Administration. It was also recognized that this task should be one of the main tasks of the Project counterpart.

Training

2.2.4 With regard to training, it was noted that two types of personnel training had been planned: a refresher course on digital communications to prepare, as necessary, State experts for the implementation of the REDDIG and on-the-job-training. The former would consist of three 10-day courses to be given by the manufacturer and fellowships for up to US\$ 40,000 would be awarded to cover the stay of two fellows from each node at the course site. It was agreed that the refresher course should be conducted prior to the installation of the nodes. The timetable of activities of the Project was amended accordingly. Likewise, it was agreed that on-the-job-training should take place during the provisional acceptance tests. Peru offered the possibility of providing a course similar to 01 course contained in the draft technical specifications, for which 15 vacancies would be available next year and indicated that interested States should coordinate with CORPAC on a timely manner for the participation of their personnel in said courses.

2.2.4.1 It was noted that the refresher courses would take place in Uruguay, Lima and Recife. Argentina offered itself as an alternative in the event that, for any reason, this could not be carried out in Uruguay. However, it was agreed the need of extending the refresher course training period up to 15 working days and, for this purpose, the Project should carry out a study on the matter, considering the DSA costs and the existing training facilities in the Region.

Counterpart experts

2.2.5 With regard to the counterpart experts, the meeting was informed of the importance of their tasks within the REDDIG implementation process and of the need for a dynamic and permanent communication with the RLA/98/019 Project Office. Note was taken of the importance for the Project to have technical information on the sites where the REDDIG nodes would be installed. A questionnaire in this respect had been sent in due time to the designated counterparts. It was indicated that Colombia had not yet designated its counterpart expert, and that Argentina and Brazil should update their designations. In this regard, the meeting formulated the following Conclusion:

Conclusion REDDIG 4.5- Counterpart experts

That States which have not yet done so:

- a) designate or update the designation of their counterpart expert; and
- b) as a matter of urgency, send to the RLA/98/019 Project Office the first questionnaire on technical aspects concerning the REDDIG nodes installation sites.

Spare parts and maintenance level

2.2.6 As an alternative to the spare part acquisition proposal contained in the draft technical specifications, the meeting examined a variation whereby spare parts would be provided upon request, as necessary, through a dealer or the contractor, within the warranty period and by virtue of it, would replace the damaged units with its own spares and at the end of the warranty period, the definite kit of spare parts would be defined, based on the experience gained with regard to the parts used by the contractor during this period. The meeting recognized the merits of this second option, but also acknowledged the difficulties that could arise for the timely recovery of the network and there would be cases in which damages were not covered by the warranty, which would prevent a timely repair of the failure due to lack of spare parts. Finally, the meeting recognized that, in view of the need to ensure the operation of the REDDIG to guarantee communication services, the respective proposal, contained in the draft technical specifications was appropriate, and should be maintained.

2.2.6.1 Upon considering the level of maintenance to be performed, it was agreed that corrective maintenance should involve the change of modules or cards or, if necessary, their delivery to the manufacturer for repair.