

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

**REGIONAL PROJECT RLA/03/901  
REDDIG System Management and Satellite Segment Administration**

**TWELFTH REDDIG COORDINATION COMMITTEE MEETING (RCC/12)**

(Lima, Peru, 9-10 March 2009)

**Agenda Item 3: Work plan for 2009**

**STUDY FOR ADDITIONAL BAND WIDTH FOR REDDIG**

(Presented by the Secretariat)

**SUMMARY**

This working paper presents a study on the requirement for additional band width for REDDIG, in view of the implementation of new services in the next years.

**Reference:**

REDDIG Operation and Maintenance Manual.

**1. Background**

1.1 The services currently passing through REDDIG are the dedicated ATS speech service, switched ATS speech service, administrative voicing, AFTN data and radar data. GNSS data for SBAS trials and data for AMHS trials have also passed through.

1.2 The transmission speed used for these services is of 9200 bits/s for ATS and administrative speech services, 2400 bits/s for AFTN data and 9600 bits/s for radar data. For SBAS trial tests, a 9600 bits/s transmission speed was used, and for the AMHS service, 64Kbits/s.

1.3 REDDIG currently has a 4.38 Mhz band width availability for the transmission of the afore described services. For the transmission of information, three carriers are used, at the following frequencies:

- a) 6.014.496 Khz;
- b) 6.016.248 Khz; and
- c) 6.017562 Khz.

1.4 All REDDIG services are modulated through three carriers, two operating at a 1.25 Msym/s modulation speed, and the remaining, at 0.625 Msym/s. The 1.25 Msym/s modulation transmission speed corresponds to a 1.75 Mhz band width, and the 0.625Msym/s, to 0.875 Mhz.

1.5 REDDIG's capacity to transmit traffic among all the nodes, in terms of bursts, is the following:

CARRIER	SYMBOL RATE	16 KBIT/S BURSTS
1	1.25 Msym/s	32 bursts
2	1.25 Msym/s	34 bursts
3	0.625 Msym/s	17 bursts

**Note:** Each traffic burst is of 16 Kbits/s.

## 2. Analysis

2.1 REDDIG currently has 42 circuits installed for the dedicated ATS speech service, 49 circuits for the switched ATS speech service, 39 voice circuits for administrative purposes, 58 AFTN circuits, 2 radar circuits and y 6 circuits for meteorological data.

2.2 REDDIG is a TDMA network, and the transmission of information is carried out through 16 Kbits/s capacity bursts. REDDIG has 1,328 Kbps available in total to transmit traffic among all the network's terminals, equalling to 83 16 Kbits/s bursts.

2.3 During the network's peak traffic period, 976 Kbps are used, equalling to 61 bursts, i.e. 73.5% of the total maximum capacity available.

2.4 Taking into account that consideration should be given to having a 10% *minimum reserve* of the total bursts before reaching the burst maximum capacity, the total number of usable bursts would be of 75 (83-8), with the aim of avoiding congestion saturation.

2.5 Considering the current major traffic peak period, there is an appropriate band width available, remaining 14 bursts available as regards the required reserve before reaching 75, which would be the maximum usable number of bursts.

2.6 Since in the next years it has been foreseen to implement new services in REDDIG, such as the ATSMHS service, radar data and other ATS voice and AFTN data services for MEVA II / REDDIG interconnection, there would be need in taking previsions regarding an additional satellite band width requirement.

2.7 As regards the ATSMHS service, the following SAM States have it currently implemented: Argentina, Brazil, Paraguay and Peru. During the course of this year, this service will be implemented in Chile, Colombia and Panama. It is expected that by 2012 most States in the Region will have this system implemented.

2.8 In accordance with initial tests made to interconnect the Ezeiza, Argentina and Asunción, Paraguay, ATSMHS systems, the transmission speech required for this application is of 64 Kbits/s.

2.9 This implies that, if this year the systems in Argentina, Brazil, Paraguay and Peru are interconnected, ten 64 Kbits circuits would require to be programmed. For 2010, interconnection with the systems in Chile, Colombia and Panama has been programmed, which would require eight additional 64Kbit/s circuits.

2.10 In addition to the interconnection of the AMHS systems, the interconnection of automated systems between adjacent ACC's is foreseen, which means that in the next years ten 9600 bits/s circuits could be installed.

2.11 This year, four 9.2 Kbits/s for ATS direct voice circuits would be implemented, as well as four 4.8 Kbits/s for AFTN circuits for the MEVAII / REDDIG interconnection.

2.12 In this respect, approximately 1300 Kbits/s would be required for 2010. Taking into consideration that the information to transmit will not be in simultaneous, and if you consider that the message transmittal simultaneity is of 50%, there would be a 650 Kbits/s requirement corresponding to 41 bursts of 16 Kbits/s.

2.13 The 41 bursts increment would equal to requiring an additional 1.25 Msym/s carrier, and increase to 1.25 Msym/s the current carrier modulated at 0.625 Msym/s. In summary, 2.63 Mhz satellite band width would be required.

2.14 Due to the above indicated aspects and with the aim of not delaying the implementation of all the new services to implement, States member of REDDIG should examine this requirement so that the REDDIG Administration coordinates this year with Intelsat the requirement for an additional band width reserve by 2010. Therefore, the following draft Conclusion is formulated:

**Draft Conclusion RCC/12-X - Additional band width requirement REDDIG**

That, in view of the new service requirements scheduled in REDDIG, such as ATSMHS, radar data and others, States member of REDDIG are urged to examine the additional band width requirement proposal before 15 May 2009, with the aim that the REDDIG Administration can proceed to reserve from Intelsat an additional band width requirement, for it to become effective by 2010.

**3. Action suggested**

3.1 The Meeting is invited to:

- a) take note of the information provided;
- b) analyze the information in Section 2, as well as draft Conclusion RCC/12-X; and
- c) analyze any other aspect regarding this subject that the Meeting might consider convenient.