

**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 2: Report of the activities carried out up to date since the last meeting  
of the REDDIG Coordination Committee**

**ANLYSIS OF THE REDDIG EQUIPMENT'S CURRENT SITUATION**

(presented by the Secretariat)

**SUMMARY**

This working paper presents an analysis to the current situation of the equipment composed by REDDIG, and proposes recommendations with the aim of keeping REDDIG's current availability.

**1. Background**

1.1 The technology of the equipment composed by the REDDIG nodes, as well as the control and management centres (NCC/NMS), date to 2002. Currently, some REDDIG equipment, such as the FRAD and Modem Linkway models, are starting to be commercially unavailable.

1.2 REDDIG project has been analyzing since the Eighth Coordination Committee Meeting (RCC/8) (Lima, Peru, 27-29 April 2005), the preparation of a plan for the improvement of the Linkway equipment hardware and software.

1.3 Following is an analysis of the REDDIG equipment's current situation as regards the Linkway, FRAD RF (SSPA/NLB) and antenna systems.

**2. Analysis**

***ViaSat Inc. Linkway system***

2.1 RCC/8 meeting formulated Conclusion RCC 8/2 - *Replacement of the hardware and upgrading of the software of the Linkway NCC/NMS Frame Relay equipment of the REDDIG* with the aim that the REDDIG Administration prepares a Linkway NCC/NMS Frame Relay & IP hardware and software replacement plan.

2.2 RCC/9 meeting (Lima, Peru, 23-24 March 2006), discussed the need to update the NCC/NMS Frame Relay & IP Linkway system's software, as the situation of the REDDIG NCC SUN (hardware) stations, which were being discontinued by the manufacturer. The Linkway system's NCC/NMS Frame Relay & IP software version is of 2002.

2.3 The meeting took note that the amount for this updating had a USD 45,530.00 cost, which included the purchasing of (6) SUN stations (no monitors), the updating of the Linkway FR&IP software, a one-year maintenance of the software, and the support from ViaSat.

2.4 RCC/10 meeting (Lima, Peru, 5-7 March 2007), noted that the updating of the software and hardware would be carried out once a network support specialist were available.

2.5 In July 2007, the Project requested an estimate to ViaSat regarding the updating of the mentioned software and hardware. The cost was of USD 119,400.00, as considered a total change to the hardware platform and to the operational system compatible with the system's new software.

2.6 RCC/11 meeting (Lima, Peru, 5-6 May 2008), agreed that, due to the high investment cost the improvements (updating of the software and hardware) to the Linkway 2100 NCC/NMS system represented, a study should be presented to RCC/12 meeting to be able to decide the best moment to make this investment and, in this regard, agreed in adopting Conclusion RCC 11/3 - *Cost-benefit research for software upgrading of Linkway system*.

2.7 The recommendation to make improvements (software and hardware updating) to the Linkway 2100 NCC/NMS was duly proposed by the REDDIG Administration as a procedure commonly employed by state-of-the-art systems as regards obsolescence and not due to a functional need of the network.

2.8 The current Linkway 2100 system technology, REDDIG network's central platform, has been efficiently operating all its services since its start-up in 2003, and is also supporting the new IP protocol based services (AMHS, RADAR, VoIP), which have already been operationally proven within REDDIG.

2.9 With the aim of presenting pertinent recommendations to improve the Linkway system, queries were made regarding the continuity to manufacture the Linkway 2100 modem (satellite modem) and its corresponding Linkway 2100 NCC/NMS.

2.10 Note has been taken, through publications and information provided via web page [www.viasat.com](http://www.viasat.com), that these products are no longer being promoted by ViaSat.

2.11 Information provided by the manufacturer is that ViaSat has developed the Linkway S2 modem (based on DVB-S2 technology for reception) and the Linkway S2 NCC/NMS software. In addition, information available indicates that the new Linkway S2 modem could be operated in a manner compatible to the Linkway 2100 modem, but the Linkway 2100 modem is not compatible with Linkway S2 modem.

2.12 Taking into consideration that the manufacturer will not continue with the development of the technology used by they Linkway 2100 system and that, nevertheless, this Linkway 2110 system, platform of REDDIG, has an operational life for the current and new services in the Region, the recommendation is to make no investment in the improvements (software and hardware updating) of the Linkway 2100 NCC/NMS.

2.13 In turn, it is proposed that this year (2009) REDDIG project increases the spare parts lot as regards the Linkway modem, with the aim of guaranteeing the operation of this equipment for a three-year minimum period, taking into account its failure statistics. As a reference, the unit cost of the Linkway modem is around USD 11,000.00 ExWorks USA.

***Memotec FRAD equipment (CX950/950e)***

2.14 The equipment used by REDDIG, since their installation in 2002, were the CX950 with I/O cards for the processing of voice and data services through the network

2.15 The software of the CX950 equipment has been duly updated during the operation of REDDIG to solve any anomalies in the signalling process, as well as to adapt it to the operation requirements of some of the services run through REDDIG, having also the manufacturer developed a version which was initially exclusive for REDDIG.

2.16 The CX950 equipment, basic unit comprising of power supply and the motherboard, were discontinued since 2006. The CX950e equipment was indicated by the manufacturer as its equivalent replacement. It is important to mention that the I/O cards are compatible for both the CX950 equipment, as for the CX950e.

2.17 Some REDDIG nodes have been replacing the CX950 equipment, basic unit, with CX950e, basic unit, when a diagnosis was made indicating failure in the motherboard.

2.18 The CX950 and CX950e and I/O cards are totally inter-operable within REDDIG.

2.19 The CX950/950e equipment has been efficiently working all its services since 2003 and, also, is supporting the new IP protocol based services (AMHS, RADAR, VoIP), which have already been operationally tried at REDDIG.

2.20 Similarly to that carried out with respect to the Linkway 2100 system, investigations were made on the manufacturing continuity of the CX950e equipment and its I/O cards.

2.21 Note has been taken, through publications in web page [www.memotec.com](http://www.memotec.com), that the products of this series are no longer commercially offered by Memotec. Information provided by Memotec is that the replacement product of CX950e is CX-960e, and that it will be sold only until 30 July 2009 (product's end-of-life).

2.22 Taking into consideration that the CX950/950e equipment count with an operational life for the current and new services passing through the Region and that, nevertheless, this equipment has been discontinued, it is recommended that the CX960e equipment and I/O cards be purchased by 30 July 2009. In this respect, it is proposed to increase REDDIG's spare parts lot for the CX960 equipment, as per statistics, to cover failures for a minimum three-year period, inclusive this year, 2009. As reference, the unit cost of the CX960e equipment, with additional interface cards as spare parts, is estimated at USD 8,900.00 ExWorks USA.

***Paradise Datacom RF system (SSPA/LNB equipment)***

2.23 Paradise Datacom, manufacturer of the SSPA equipment, has been developing its product since 2002, when this equipment (2K series) was installed in REDDIG. The changes made to their new SSPA models are compatible with the REDDIG stations' transmission requirements.

2.24 REDDIG project purchased a new SSPA model (100K series) in 2005 and, also, some States have purchased other new SSPA (200K series) models in the past years.

2.25 It is important to mention that, when new SSPA equipment is purchased, account should be given to the interoperability of the new SSPA M&C (Monitoring & Control) with the REDDIG's current RM&C system. For this, the Purchase Order must specify that the SSPA's M&C should have binary communications protocol with a 38400 Baud rate.

2.26 The LNB's current model will be able to continue operating and, in the event of purchasing new equivalent models, consideration should be given for the electrical and mechanical specifications to comply with the network's operational characteristics.

#### *Antenna system*

2.27 The antenna system can continue operating until migration is made to a new Communications platform, following the recommendations duly provided for their mechanical and electrical maintenance.

### **3. Recommendations**

3.1 Taking into account the aforementioned analysis, it is recommended that no investment be made in the improvements (software' and hardware updating) of the Linkway 2100 NCC/NMS, nor of the CX950 and CX950e Memotec equipment.

3.2 Taking under consideration that the Linkway 2100 modem and Memotec CX950 and CX950e currently installed in REDDIG meet current and future requirements, such as the new IP protocol based services (AMHS, RADAR), it is recommended to keep them operating for an additional three-year period, to later proceed with a complete new technology. With the aim of guaranteeing operational availability and taking into account the equipment's current failure index, shown in **Appendix A** to this working paper, it is recommended that REDDIG purchases the list of spare parts presented in **Appendix B** to this working paper, in order to increase the spare parts lot. The purchasing of this equipment must be made before 30 July 2009, as this would be the last year that this equipment is commercially available.

3.3 As regards the Paradise Datacom RF system (SSPA/LNB equipment), the changes introduced by the manufacturer are minimum and, therefore, this equipment would continue commercially available in the market, as also the antenna system.

3.4 Taking into account the aforementioned, the Meeting is presented with the following draft Conclusion:

#### **Conclusión RCC/12-X - Actions to keep the operativity of REDDIG equipment of the next years**

Taking into consideration that REDDIG's current equipment meets current and future services' requirements, it is urged that:

- a) The current REDDIG equipment is kept for a minimum period of three years;
- b) That REDDIG project purchases by 30 July 2009 the list of spare parts included in Appendix B to this working paper, to increase the REDDIG's spare parts lot; and

- c) That the REDDIG Administration elaborates a plan for a complete technology change to the current REDDIG equipment, for its implementation within a period minimum of three years, starting 2009, and that it is presented at RCC/13 meeting.

4. **Action suggested**

4.1 The Meeting is invited to:

- a) take note of the information presented in this working paper;
- b) analyze the actions suggested for the operation of the current REDDIG equipment in the next years, described in Section 2 of this working paper;
- c) analyze the conclusion in paragraph 3.4, for its approval; and
- d) analyze any other aspect related with this matter that the Meeting might consider necessary.

-----

**APPENDIX A / APENDICE A**

**REDDIG**  
**FAILURE STATISTICS - MAIN EQUIPMENT AND PARTS**  
**ESTADISTICAS AVERIAS - PRINCIPALES EQUIPOS Y PARTES**

	2004	2005	2006	2007	2008	TOTAL
<b>FRAD</b>						
CPU-Motherboard	2	4	2	2	1	11
Universal I/O		2	6	1	4	13
P/S EOS AC/DC	2		2	3	2	9
DAV	1	2				3
E1 DIM	1		1			2
Multi I/O		1	1	1	1	4
E&M SLIM		2			1	3
Ring Generator P/S		1			1	2
V.35H					1	1
Internal Fan			4	9	8	21
<b>MODEM</b>						
Terminal Linkway 2100	4	4	4	5	5	22
FR Module			1			1
<b>RF</b>						
SSPA	5	3	5	4	3	20
LNB		1				1
Ext Fan SSPA				2	11	13

-----

**APPENDIX B / APENDICE B**

**REDDIG  
FAILURE STATISTICS - MAIN EQUIPMENT AND PARTS  
ESTADISTICAS AVERIAS - PRINCIPALES EQUIPOS Y PARTES**

<b>FRAD</b>				<b>Quantity/ Cantidad</b>
CPU-Motherboard				5
Universal I/O				6
P/S EOS AC/DC				6
E1 DIM				1
Ring Generator P/S				2
<b>MODEM</b>				
Terminal Linkway 2100				3
Power Supply				6

- END / FIN -