



**INTERNATIONAL CIVIL AVIATION ORGANIZATION
WESTERN AND CENTRAL AFRICA OFFICE**

**Seventh Meeting of the Central Atlantic FIR Satellite Network (CAFSAT) Management
Committee (CNMC/7)
(Paris, France, 5-6 June 2017)**

Agenda item 4: CAFSAT re-engineering and modernization

CAFSAT stations upgrade. Phase II.

(Presented by Portugal)

SUMMARY

This Working Paper presents guide lines for implementation of phase II of CAFSAT stations.

Reference: Document “Technical Study for CAFSAT network upgrade – February 2012”.

CNMC/6 Decision 6/07

CNMC/6 Conclusion 6/08

1. Introduction

During last CNMC/6 meeting (Lisbon 6th and 7th June 2016), the Decision 6/07 considered that CAFSAT modernization and re-engineering phase I is completed.

On other hand the Conclusion 6/08 reminded the CNMC Members to:

- Revitalize the process to conduct Phase II of CAFSAT modernization and re-engineering.
- Take into account the technology evolution to ensure the cost effectiveness for the future development of the network.

This WP presents guide lines for CAFSAT Phase II modernization and re-engineering.

2. Presentation

2.1. Base Band

Most of the stations have already implemented the Phase I and some others will completed the Phase I in near future, instaling the Memotec NetPerformer equipments SDM 9230 and SDM 8400.

2.2. Satellite

The current satellite used by CAFSAT is the Intelsat IS-901, which is supposed to reach its end of life during 2018.

Intelsat will launch a new satellite, the IS-37, to ensure the services they are giving to their customers using IS-901.

The satellite IS-37 will be located in the same orbital position, which means there will be no need to re-point the antennas and the frequencies will be in the same range as the current ones.

Unless we can find another option that has considerable economical savings, the best option is to continue with the same satellite operator.

Due to higher potential attenuation with rain in some stations, it is recommended to keep the operation in C band instead of Ku band. Changing the band it will imply change of all RF equipment (antenna, HPAs, LNBS...) in all CAFSAT stations.

In order to simplify expansion of the network the operation based in a global beam transponder it is recommended.

2.3. Antenna

Keeping the operation in C band will not need any change in the current installed antennas.

2.4. Satellite Modems

The recommended modem (modulators and demodulators) shall be one that is compatible with the existing modems installed in different CAFSAT stations.

Shall be a state-of-the-art equipment with features that allow bandwidth savings using modern FECs and turbocodex and compatible with modern equipments using IP connectivity.

There is equipment that fulfils these requirements and has already been installed in some CAFSAT stations that is the Radyne DMD20.

This is the type of modem recommended to be installed in Phase II of CAFSAT modernization and re-engineering for both, modulators and demodulators.

2.5 RF:

The stations that have not upgraded the HPAs in the last years are equipped with transceivers that will reach its end of life very soon.

Regarding the type of equipment, most of the current installed devices are transceivers with input frequency of 70 or 140MHz because old modems worked with these Intermediate Frequencies.

Nowadays it is still possible to use this type of equipment but most of the modems currently work in L-band and it is more usual and economical to use BUCs.

The recommendation would be to install BUCs. Nevertheless transceivers are also acceptable.

With the installation of BUC's new RF cables need to be installed to interconnect modems and BUC's.

There is no need on any change in the antenna itself, as well as in the LNBS.

Nevertheless it is strongly recommended that BUC's or transceivers and LNB's be installed in a main / standby configuration, controlled by M&C sub system.

2.6. M&C subsystem:

All equipment of CAFSAT II shall support SNMP over IP management capabilities.

2.7. QoS

Availability shall be $\geq 99.95\%$.

MTTR shall be ≤ 30 minutes.

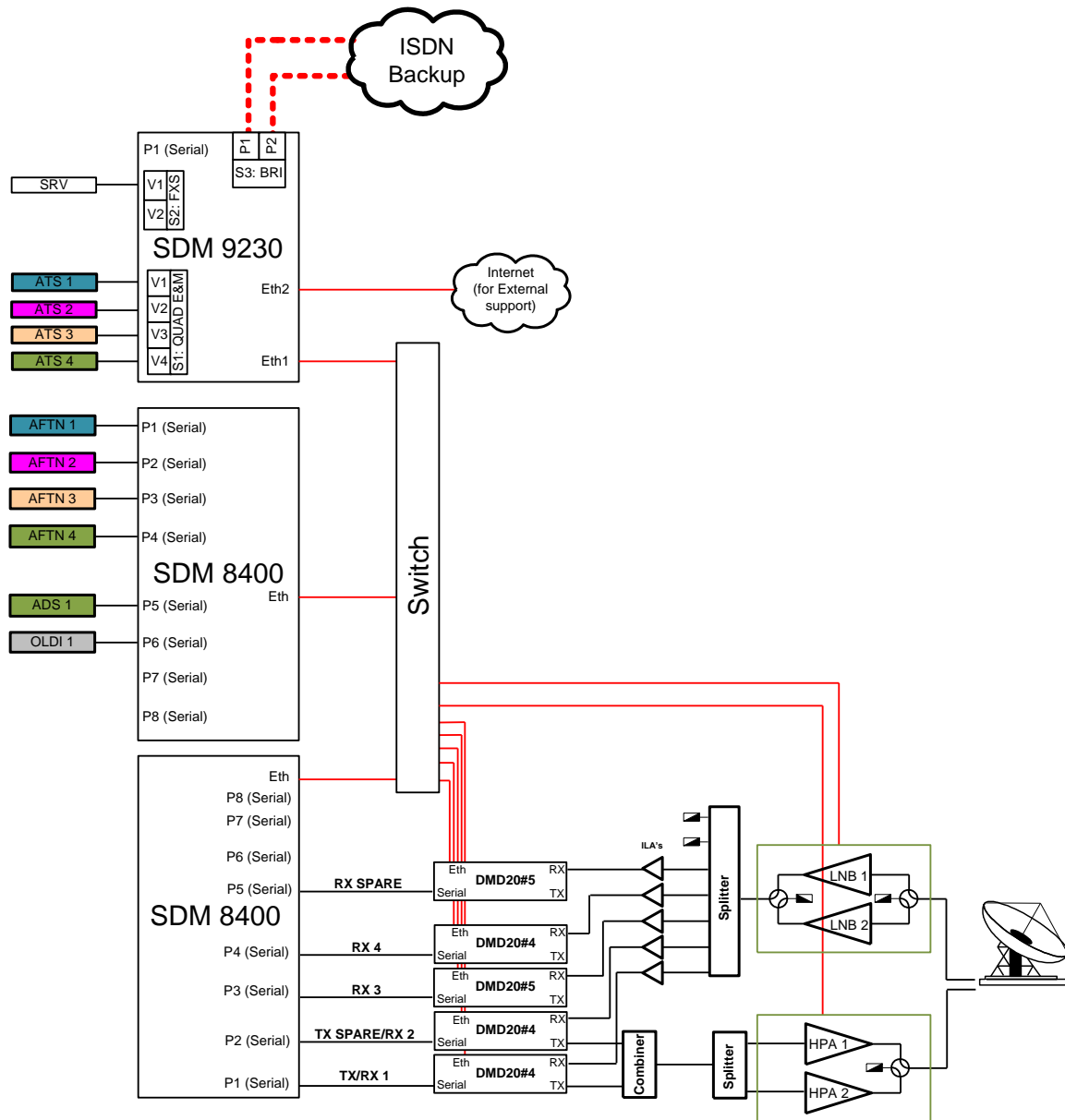
2.8. Generic considerations

Taking into account that:

- CAFSAT network has been working very well since its development and installation;
- The structure of the network and the different regions involved;
- Migration from current network to CAFSAT phase II should be as smooth as possible;
- Service disruption shall be kept for a minimum;
- Migration in one ANSP shall be as independent as possible of other ANSP's;
- A centralized procurement / management it is not considered feasible due to institutional issues;
- A centralized solution would also imply that all the stations have to migrate the satellite modems at the same time that is a very difficult scenario;

It is propose to continue with the current CAFSAT network approach, a decentralized CAFSAT network, being each ANSP responsible for procurement and operation of its own station(s).

Recommended diagram of CAFSAT II Phase II



3. Action by the meeting

The meeting is invited to:

Discuss and endorse the content of this WP.

-----End-----

(4 pages)