



**FIRST MEETING OF CAFSAT NETWORK MANAGEMENT COMITEE
(Recife, Brasil, 2 May 2011)**

Agenda Item 5: CAFSAT modernization and re-engineering

“Roadmap for CAFSAT modernization and re-engineering”

(Presented by Spain)

SUMMARY

This WP presents a proposed roadmap for the modernization and re-engineering of CAFSAT network.

1. BACKGROUND

According to its “Terms of Reference”, the CAFSAT Network Management Committee should monitor and harmonize the Network operation and management by defining a cooperation methodology which regards, among other topics, the development and modernization of CAFSAT after a joint technical and re-engineering study.

This WP focuses on the key issues to be taken into account in such study and propose a roadmap for the modernization and re-engineering process.

2. DISCUSSION

See attached file: *CNMC/1 WPx CAFSAT re-engineering.ppt*

3. ACTION BY THE MEETING

The CNMC/1 meeting is invited to:

1. Take note of the attached information.
2. Plan internal actions/projects to meet the proposed roadmap.
3. Share such plans in order to coordinate with the rest of the CAFSAT community (basically, its collaterals) the deployment of the roadmap.



CAFSAT

MODERNIZATION AND RE-ENGINEERING

(presented by Spain)

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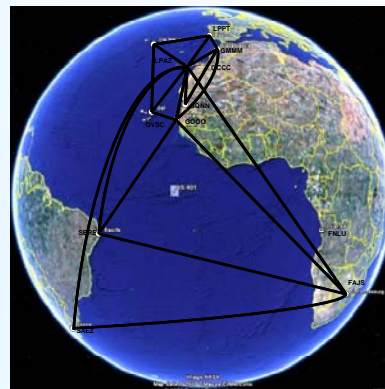


Current Network (1)



CAFSAT: Central Atlantic FIR's VSAT Network

- Satellite: INTELSAT IS-901 (342° E)
- C band
- Global Beam
 - Gran Canaria (Spain)
 - Casablanca (Morocco)
 - Sal (Cape Verde)
 - Dakar (Senegal)
 - Lisbon (Portugal)
 - Sta. Maria (Portugal)
 - Recife (Brazil)
 - Johannesburgo (South Africa)
 - Ezeiza (Argentina)
 - Nouackchott (Mauritania)



- First node deployed: Gran Canaria (2000) – Last one: Nouackchott (2007)
- Last upgrade (baseband): Lisbon/Sta. Maria (2010)

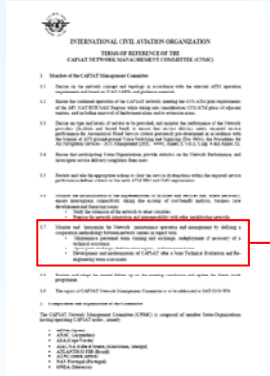
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CNMF Terms of Reference



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1.7 Monitor and harmonize the Network maintenance operation and management by defining a cooperation methodology between network centers in regard with:

- Maintenance personnel team training and exchange, redeployment if necessary of a technical assistance;
- Spare parts exchange, fault location/repairs, and turnaround time
- Development and modernization of CAFSAT after a Joint Technical Evaluation and Re-engineering team assessment.

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Current equipment (1)



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- Stations have currently many differences due to the different organization's requirements and technology changes through their lifecycles:
 - Different equipment
 - Different redundancy architecture
 - Different software versions
- Equipment obsolescence: Changes in market and technology trends are rather quick for a 10-15 years network scenario (mostly in base band)

Design of first nodes (Las Palmas, Dakar and Sal) was done in 1998. First implementation was on 2000 → network is becoming obsolete

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Current equipment (2)



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Following table summarizes current status of the installed equipment:

Equipment	Status	LPA	DKR	SAL	CAS	REC	JNB	EZE	LIS	SMA	NKC
Modem Comstream 701	OoP	X	X	X	X	X	X	X(2)	X	X	
Demodulator Comstream 401/i2000	OoP	X	X		X		X	X	X	X	
Transceiver SSE 10 w C-Star	OoP	X	X(1)	X		X					
Mux Nuera F200	OoP	X	X	X	X	X	X	X	X	X	
Memotec CX1000	OoP	X	X	X	X	X	X	X	X	X	
Memotec CX950e	OoP	X									X
Memotec Netperformers	COTS								X	X	

OoP: Out of Production
 COTS: Commercial off the shelf
 (1): New BUC already purchased
 (2): Comstream 601 version

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Coming/future network scenario



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- New ATC/ATM applications or new implementations of existing ones demand new IP-based services or protocols.
- CAFSAT should be interoperable with other VSAT or terrestrial networks carrying ATC/ATM information at two different levels:

- End-to-end Service
- Network interconnection

e.g. VSAT: REDDIG, AFISNET...

*e.g. terrestrial: REDAN (Spanish Air Navigation Network)
→(AMHS Madrid-Casablanca, AMHS Madrid-Ezeiza...)*

- Frame Relay technology is becoming obsolete (FR Forum disbanded), but still valid (in the short term) as transport protocol

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Additional requirements



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- Independence of equipment manufacturers (fully standard protocols for access and transport)
- Optimization of space segment use → increase cost effectiveness
- New concepts based on DVB-S2 standards and dynamic resource allocation

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Need for a roadmap



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As a consequence...

"... In order to harmonize the re-engineering exercise in the framework of CNM Terms of Reference it should be advisable to **develop a roadmap of the Network modernization and re-engineering** taking into consideration the current requirement of the existing operational application and the future requirement of the new applications.

This roadmap, based on ICAO guidelines for the provision of VSAT network should lead to the development of Terms of Reference of CAFSAT Network modernization and re-engineering exercise comprising the clear definition of the operational requirements with a service level performance assessment process, maintenance personnel training, turn over requirement and cost effectiveness..."

(from CNMC/1– WP/05)

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Proposed roadmap



At any time, no coordination required:

1. Replacing CX-1000 by new NetPerformer as FR switch

Required coordination with collateral stations:

2. New services (circuits) enabled in NetPerformer devices as FRAD
3. Migration of services to NetPerformer – Decomission of Nuera F200

After further discussion and consensus in CNCM:

4. Upgrade of modulation schemes (e.g.: turbo codes)
5. Review of modems architecture (e.g.: FDMA vs TDMA)
6. Upgrade of protocols (e.g.: IP/MPLS)

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Conclusions / Actions



The meeting is invited to

1. Take note of the herewith information
2. Plan internal actions/projects to meet the proposed roadmap
3. Share such plans in order to coordinate with the rest of the CAFSAT community (basically, its collaterals) the deployment of the roadmap

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Thank you !!!

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