INTERNATIONAL CIVIL AVIATION ORGANIZATION

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
THIRTEENTH MEETING (APIRG/13)
(Sal, Cape Verde, 25-29 June 2001)

Agenda Item 4: Air Navigation issues
CNS/ATM Planning/Implementation

4.7 :- ADS installation on Canaries ACC and text for the extension through the Eur/Sam corridor (AR1)

(Presented by Spain)

SUMMARY

Presentation of ADS/CPDLC system installed and operative in Canary Islands and experiences to share ADS information in EUR/SAM Corridor.

1. INTRODUCTION

In 1996 AENA initiated the development of an experimental stage for ADS/CPDLC. The result of those studies has been the system installed in Canaries ACC that permits to improve the efficiency in the services provided to aircraft equipped with FANS 1/A. The system has also a simulator that will facilitate the instruction of the ATCOs and the analysis of new procedures.

2. The Canaries ADS/CPDLC

- ADS-SSR track presentation
- STCA/MTCA (Short/Medium Term Conflict Alert)
- NIM (Navigation Integrity)
- Automatic activation/cancellation of ADS contracts
- Autom/Manual management of ADS contracts
- Display of GPS availability
- Detection of navigation errors
- Full CPDLC

3. ADS IN EUR/SAM CORRIDOR

As owners of a private VSAT system (CAFSAT) that permits safe, quick and trust communications between members of the corridor, the idea that appeared was **¿why not use this common communication support to share ADS information?** The idea was just to configure a CAFSAT Channel to send ADS tracks and to ensure the presentation and refreshing of information on the remote node.

Three sates of application where studied based in the level of equipment (cost) and funtionalities required:

BASIC:

- **ADS Tracking.**
- **STCA, MTCA and MSAW based on ADS contracts supplied information.**
- **Navigation Integrity Monitoring.**
- **Navigation induced errors detection.**
- **ADS contracts automatic activation.**
- **ADS contracts automatic cancellation.**
- **Automatized and centralized ADS contracts management.**

INTERMEDIATE:

- **Synthetic tracks generation and presentation.**
- **Flight Plan Information.**

FULL:

- **Flight Plain Automatic Updating.**
- **Data Link MET-AIS Database queries.**
- **ADS contracts and parameters specific requests.**
- **Controller-Pilot functional parameters interchange.**
- **Controller-Pilot message interchange.**

3- TR

A lot of trials where done in order to ensure the capability of CAFSAT as comm. support for ADS information. For instance, a simulation for a Simple ADS contract (*predicted* root -estimation to next heavy point- and earth reference -includes position and speed):

Notification Time	Bytes/message*
12:02:6.62480	122
12:03:13.03380	122
12:04:19.30227	122
12:05:25.58125	122
12:06:31.80975	122
12:07:38.30869	122
12:08:44.46733	122
12:09:50.49618	122

**Information extracted from Canary Islands ADS System*
Will consider **192 bytes to include control data information*

*If in at same instant t, n aircraft send a notification, a contract solicitude or any other kind of ADS message… the band width occupied would be n*192 bytes. Just with 2.400 bps space segment disposal: 2.400/192 -> 12 notifications could be simultaneously sent.*

"On a simple channel of 2400 bps in the transmission CAFSAT node, up to 720 ADS display messages per minute may be broadcast to all nodes (on a Simple ADS contract configuration)".

As result of this tests in January 2001 a protocol was developed by Cape Verde and Spain: "A SUN ULTRA 10 Station was configured and installed in Sal Acc Control Room. A 19200 bps Cafsat Channel was routed and dedicated to this purpose and the system was overload with several simulation exercises. **The result is that at that moment Cape Verde receives from Canary Island ADS system ADS/SSR information that, presented on a screen, results to be fully operative "**

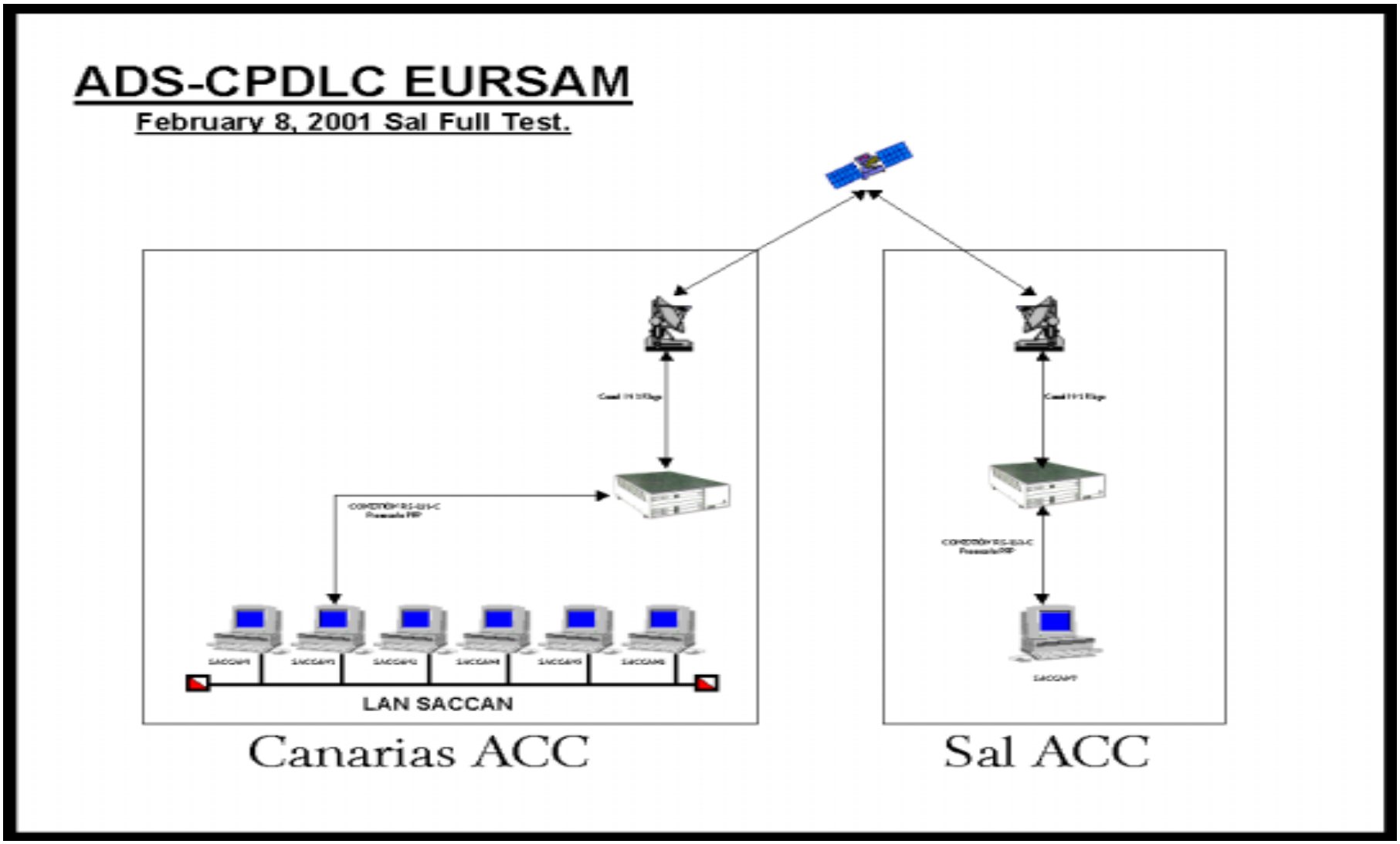
Furthermore, Spain will initiate protocols for "ADS sharing" with other members of EUR/SAM Corridor as soon as they are CAFSAT equipped

4. Actions by the meeting

The meeting is invited to:

a) take notice of this information
b) encourage the agreements and co-operation between the AFI regions so as to make the best use of the ADS/CPDLC implementations.

Annex: SAL/CANARIAS ADS/CPDLC VIA CAFSAT

SAL/CANARIAS ADS/CPDLC VIA CAFSAT

ANNEX