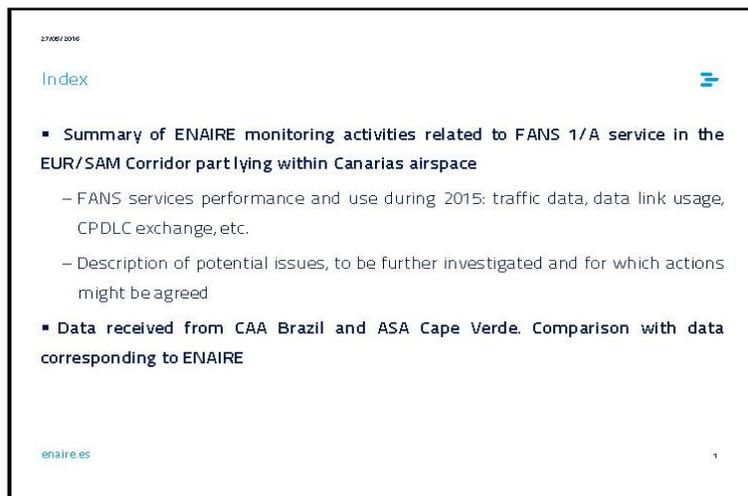


Appendix – C: CFRA Analysis of FANS Services for 2015

27/05/2016

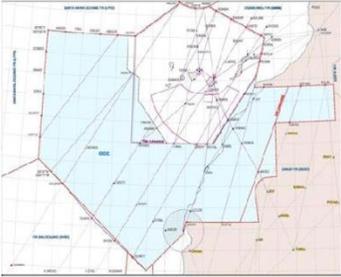


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Scope

Results based on the analysis of performance and use of FANS services in the EUR/SAM Corridor within the Canarias airspace (SACCAN system data)

Flights either overflying EDUMO, TENPA, IPERA or GUNET or flying those RANDOM routes with NELSO and/or ROSTA as route waypoints and with exit points at the south of Canarias airspace defined by coordinates



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Use of FANS Services (1/3)

Traffic data

- FANS connected flights: 52,85% of total EUR/SAM Corridor flights. Slight decrease from 2014 (56,10%)
- Almost every equipped flight connects to SACCAN (93,93%)
- Around 94% of connected flights exchange CPDLC information
- The number of different airframes flying over EUR/SAM Corridor connected to SACCAN is 241-310 per month

Traffic Data Summary	2015 Mean Value	Max Value	Min Value
Number of connected flights (Monthly average)	1070	1242 [Sep]	879 [Feb]
Percentage referred to total number of flights in the EUR/SAM Corridor	52,85%	56,92% [Sep]	46,79% [Nov]
Percentage referred to flights in the EUR/SAM Corridor indicating data link and ADS capacity in the Flight Plan	93,93%	99,12% [Mar]	90,40% [Jun]
Number of flights with CPDLC connection (Monthly average)	1003	1171 [Sep]	819 [Feb]
Number of different aircraft (aircraft registration) connecting to SACCAN (Monthly average)	282	310 [Jul]	241 [Feb]

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Use of FANS Services (2/3)

Airlines data

- Leading airlines: TAP Portugal, Air France and Iberia, comprising more of 50% out of the total connected flights between the three of them
- Along with TAM Brazil and Air Europa they comprise about 70% of the total number of connected flights
- Adding Lufthansa, British Airways and KLM to the previous five ones, percentage increases up to about 84%

Airline (% referred to connected flights)

TAP Portugal	Air France	Iberia	TAM Brazil	Air Europa	Lufthansa	British Airways	KLM
26,90%	13,75%	12,37	10,72%	7,12%	5,19%	3,98%	3,64%

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Use of FANS Services (3/3)

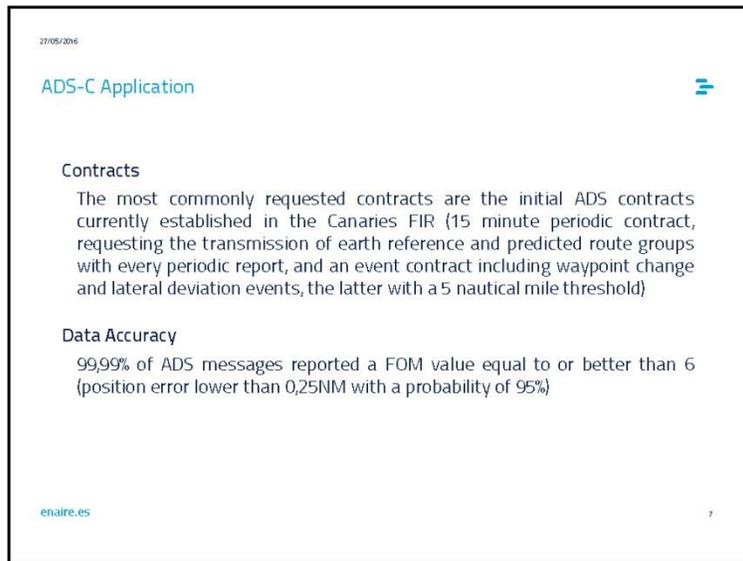
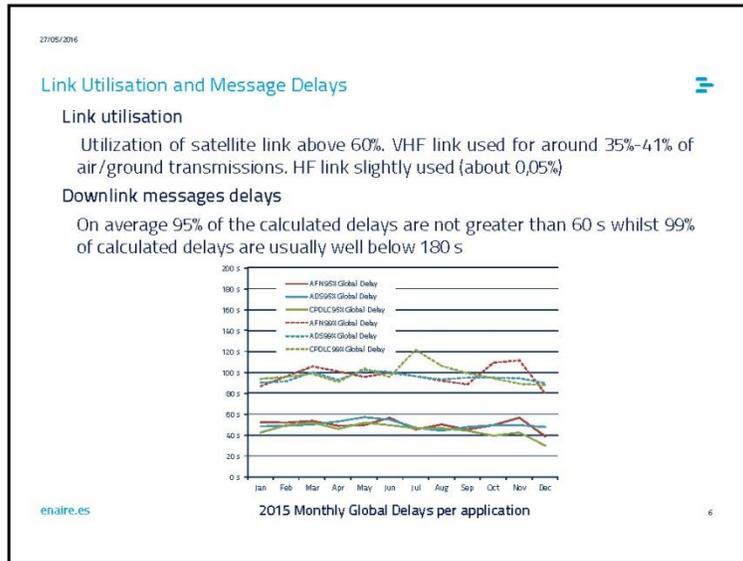
Aircraft data

A330 and B777 are the most common types of long range connected aircraft

Aircraft Type	Percentage
A330	42.10%
B777	27.28%
A340	13.70%
B747	6.57%
B767	3.47%
B787	0.69%
Other	6.19%

Total percentage of different types of connected aircraft

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CPDLC Application

Most frequent uplink messages

The free text element, message elements related to CPDLC communications transfer and contact message and are the most common uplink messages

Most frequent downlink messages

Responses "WILCO" and "ROGER", followed by the "Position Report" are the most common downlink messages

	Message element	Percentage referred to total		
		2015 Mean Value	Max Value	Min Value
Uplink	[freetext]	23,97%	26,85% [Oct]	22,06% [Sep]
	CONTACT [icaounitname] [frequency]	17,54%	18,97% [Sep]	16,13% [Oct]
	NEXT DATA AUTHORITY [icaofacilitydesignation]	16,72%	21,71% [Jul]	13,74% [Oct]
	END SERVICE	15,73%	18,86% [Jun]	12,28% [Mar]
	SQUAWK [beaconcode]	13,39%	16,88% [Oct]	9,36% [Jul]
Downlink	Wilco	44,45%	46,29% [Mar]	41,49 [Jul]
	Roger	23,53%	28,27% [Jul]	21,29% [Sep]
	POSITION REPORT [positionreport]	9,72%	11,46% [Nov]	8,16% [May]
	[freetext]	6,36%	7,43% [Jan&Feb]	4,76% [Jun]

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Potential issues identified (1/3)

- Several issues detected during the analysed period
- All of them already identified during previous analysis
- Issues allocated to two categories:
 - Operational (operative)
 - Technical or related to Interoperability
- Coordination between stakeholders should be established in order to investigate them appropriately
- Effective ongoing coordination examples:
 - Issue regarding the declaration of ATN capacity in the Flight Plan solved after being communicated during 2014 to affected airlines
 - Coordination between SITA and ENAIRE for the periodic monitoring of some technical issues (repeated messages, high delays, communication problems, etc.)

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Potential issues identified (2/3)

Operative Issues

- Issues dealing with the operation of FANS services
- Subdivided in two categories:
 - **Air side:**
 - Log-On messages with incorrect identification
 - Log-On from aircraft that are not flying towards Canarias airspace or from aircraft flying far away prior to enter an airspace where ADS/CPDLC is operational
 - Aircraft ADS connected long after exiting Canarias airspace
 - Sending of Character-Oriented applications messages (RCLs, RAIs)
 - Aircraft not declaring ADS or CPDLC capability in their Flight Plans
 - Emergency reports while no unusual or emergency situation is detected
 - **Ground side**
 - Flight Plans with incorrect aircraft registration
 - Sending of ACARS Free Text messages
 - "END SERVICE" CPDLC messages sent with additional message elements which response attribute is not Wilco/Unable
 - Uplink CPDLC connect requests replied with a CPDLC disconnect request message notifying the aircraft is CPDLC connected to another ATS authority

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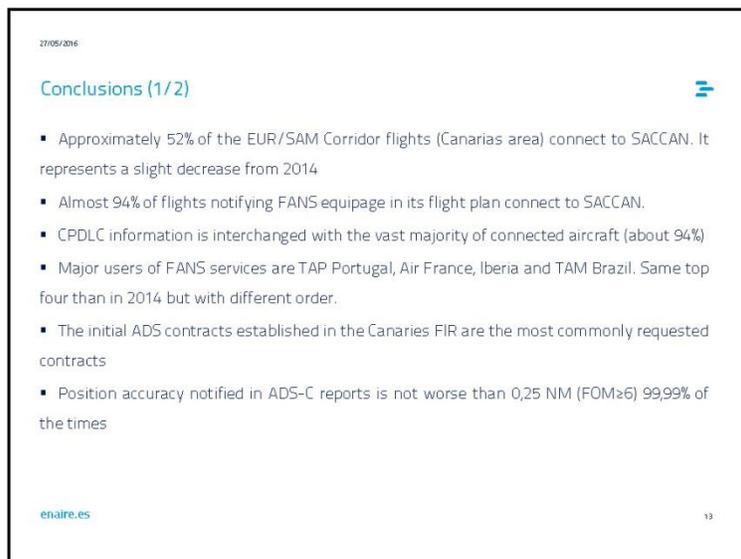
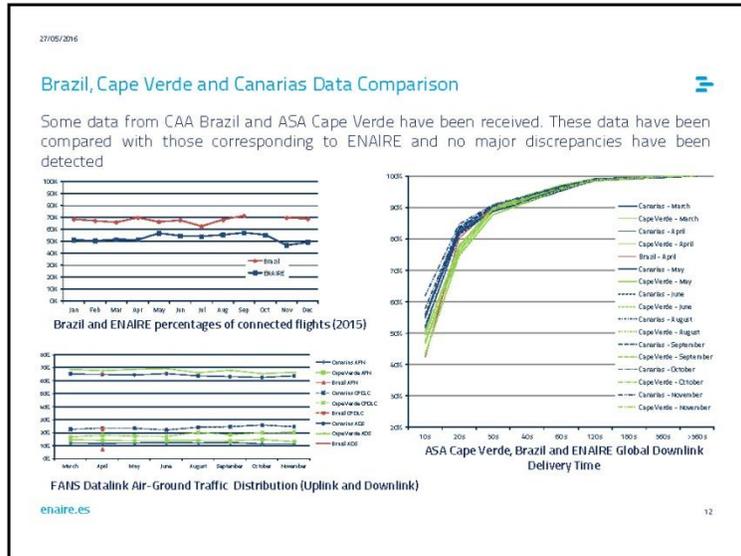
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Potential issues identified (3/3)

Technical or interoperability Issues

- Issues entailing some technical aspects or concerning the interaction of aircraft and ground systems
- Subdivided in three categories:
 - **General:**
 - Messages with incoherent time stamps
 - Uplink and downlink messages probably being sent more than once by the DSP
 - Unexpected Service Messages
 - Messages with excessively high delays
 - Communication/connection problems
 - **Concerning ADS:**
 - Different reports with different time stamps sent together in the same ADS message
 - Identical reports of Waypoint Change event received within an ADS message
 - Reception of ADS contract responses to contracts not requested
 - ADS reports notifying FOM equal to zero (0)
 - **Concerning CPDLC:**
 - Incorrect CPDLC messages
 - Aircraft not accepting a connection request (CR) message after receiving an uplink CPDLC disconnection request (DR) message
 - Aircraft ignoring uplink disconnection request (DR) messages

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Conclusions (2/2)

- After the Free Text element, message elements related to the process of CPDLC communications transfer are among the most used by controllers. Message elements belonging to the response elements group are the most used by pilots
- On average 95% of the calculated delays are not greater than 60 s whilst 99% of calculated delays are usually well below 180 s
- Several issues (operational and technical and related to interoperability) have been detected. Coordination between stakeholders should be established in order to investigate them appropriately
- Data from CAA Brazil and ASA Cape Verde have been received and compared with those corresponding to ENAIRE. No major discrepancies have been detected

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REMINDER

Data for the analysis of FANS services in the EUR/SAM Corridor (1/3)

- As it was stated in Conclusion SAT/FIT 8/01, involved SAT States should provide SATMA the required data and notify to SATMA any problem detected along the Corridor/South Atlantic
- Data should be sent before the end of the following month in order to assure its analysis and inclusion in the annual CFRA document. Therefore, data received after January next year cannot be considered in the analysis
- During 2015 some states have provided to ENAIRE some limited data that have been analysed and included as an Annex in the 2015 CFRA Report
- ENAIRE analyses all received data and, when possible, compares them with those corresponding to ENAIRE. Nevertheless, to perform the corresponding analysis of FANS services in the EUR/SAM Corridor part within each state, the data to be provided is that stated in SAT/FIT 7 Report (see following slide)

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REMINDER
Data for the analysis of FANS services in the EUR/SAM Corridor (2/3)

- Data to be collected and provided to CFRA – Monthly base (excerpts from SAT/FIT 7 Report)
 - Traffic Data
 - Number of connected flights
 - Percentage referred to total number of flights in the EUR/SAM Corridor
 - Number of flights with CPDLC connection (monthly average)
 - Number of different aircraft (aircraft registration) connecting to ADS (monthly average)
 - Downlink (air to ground) messages delays
 - Percentage of connected flights from the most significant airlines
 - Percentage utilization value per data link media used for air-to-ground communications (satellite link and VHF link)
 - Cumulative percentage values per FOM
- DSP (SITA) ATS Performance Report for each month, when available, can be also provided to CFRA for their analysis and comparison

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REMINDER
Data for the analysis of FANS services in the EUR/SAM Corridor (3/3)

FANS/CFRA Notification Form

1. Reporting Date:	2. Reporting Unit:	5. Aircraft Type:	6. FANS EQUIPE
3. Operator Name:	4. Call Sign:	8. Time UTC:	9. Occurrence Position
7. Date of Occurrence:			
15. Description and Action Followed:			

CLASIFICACION

1. Log-On received from aircraft not flying your airspace
2. A/C Log-On with incorrect flight identification
3. Log-On from Aircraft not declaring ADS capacity in FP
4. Unknown ADS messages are received.
5. A/Cs remain ADS connected after exiting airspace
6. A/Cs remain ADS connected after landing
7. Different reports in the same ADS message.
8. Identical reports of Waypoint Change received in an ADS message
9. CPDLC Message: "Not Current Data Authority"
10. Incorrect downlink CPDLC messages have been received
11. Other (describe): _____

Crew/Controller comments (if any)

When complete please forward the report(s) to: South Atlantic Monitoring Agency (SATMA-CFRA)
E-Mail: satma@aena.es

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