



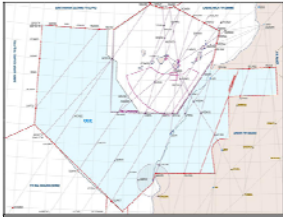
Index

- Summary of ENAIRE monitoring activities related to FANS 1/A service in the EUR/SAM Corridor part lying within Canarias airspace
  - FANS services performance and use during 2014: traffic data, data link usage, CPDLC exchange, etc.
  - Description of potential issues, to be further investigated and for which actions might be agreed
- Data received from CAA Brazil, ASA Cape Verde and ASECNA Dakar. Comparison with data corresponding to ENAIRE

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



Use of FANS Services (1/3)

**Traffic data**

- FANS connected flights: 56,10% of total EUR/SAM Corridor flights. Slight increase from 2013 (55,13%)
- Almost every equipped flight connects to SACCAN (95,92%)
- Around 95% of connected flights exchange CPDLC information
- The number of different airframes flying over EUR/SAM Corridor connected to SACCAN is 234-315 per month

Traffic Data Summary	2014 Mean Value	Max Value	Min Value
Number of connected flights (Monthly average)	1284	1439 [Oct]	1115 [Nov]
Percentage referred to total number of flights in the EUR/SAM Corridor	56,10%	61,38% [Sep]	51,99% [Dec]
Percentage referred to flights in the EUR/SAM Corridor indicating data link and ADS capacity in the Flight Plan	95,92%	>100%* [Nov]	93,64% [May]
Number of flights with CPDLC connection (Monthly average)	1219	1363 [Aug]	1051 [Nov]
Number of different aircraft (aircraft registration) connecting to SACCAN (Monthly average)	280	315 [Jul]	234 [Jan]

\* This value was probably caused by the presence of aircraft connecting to SACCAN without declaring ADS capacity in their flight plans

Use of FANS Services (2/3)

Airlines data

- Leading airlines: TAP Portugal and Air France, comprising more of 45% out of the total connected flights between the two of them
- Along with TAM Brazil and Iberia they comprise about 70% of the total number of connected flights
- Adding Lufthansa, Air Europa, British Airways and KLM to the previous four ones, percentage increases up to about 88%

Airline (% referred to connected flights)

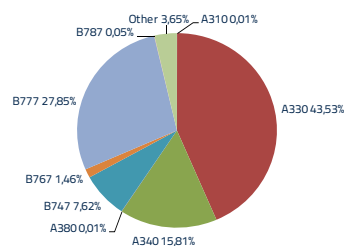
TAP Portugal	Air France	TAM Brazil	Iberia	Lufthansa	Air Europa	KLM	British Airways
27,50%	18,20%	13,47%	11,97%	6,04%	4,53%	3,16%	3,16%

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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



Total percentage of different types of connected aircraft

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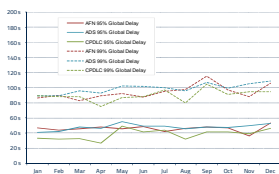
Link Utilisation and Message Delays

Link utilisation

Utilization of satellite link above 60%. VHF link used for around 35%-40% of air/ground transmissions. HF link slightly used (about 0,06%)

Downlink messages delays

Slight worsening over the studied period. Nevertheless, on average 95% of the calculated delays are not greater than 60 s whilst 99% of calculated delays are usually well below 180 s



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ADS-C Application

Contracts

The most commonly requested contracts are the initial ADS contracts currently established in the Canaries FIR (15 minute periodic contract, requesting the transmission of earth reference and predicted route groups with every periodic report, and an event contract including waypoint change and lateral deviation events, the latter with a 5 nautical mile threshold)

Data Accuracy

99,96% of ADS messages reported a FOM value equal to or better than 6 (position error lower than 0,25NM with a probability of 95%)

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## CPDLC Application

### Most frequent uplink messages

Message elements related to CPDLC communications transfer, contact message and the free text element 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		
		2014 Mean Value	Max Value	Min Value
Uplink	NEXT DATA AUTHORITY [icaofacilitydesignation]	20,61%	24,05% [Feb]	16,64% [Dec]
	CONTACT [icaounitname] [frequency]	19,59%	21,41% [Feb]	17,61% [Dec]
	[freetext]	19,25%	24,86% [Dec]	14,39% [Feb]
	END SERVICE	15,64%	18,73% [Feb]	12,53% [Oct]
	SQUAWK [beaconcode]	11,39%	14,07% [Dec]	9,78% [Jul]
Downlink	Wilco	45,80%	49,40% [Jul]	43,20 [Jan]
	Roger	20,83%	23,89% [Aug]	16,34% [Feb]
	POSITION REPORT [positionreport]	9,99%	12,28% [Feb]	7,70% [Aug]
	[freetext]	6,51%	8,03% [Jan]	5,31% [Aug]
	DEVIATING [distanceoffset] [direction] OF ROUTE	4,78%	6,64% [Jan]	4,74% [Dec]

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## Potential issues identified (1/3)

- Several issues detected during the analysed period
- Most of them already identified during previous analysis. There are also some new ones
- 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 in progress to be solved after being communicated recently 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 Flight 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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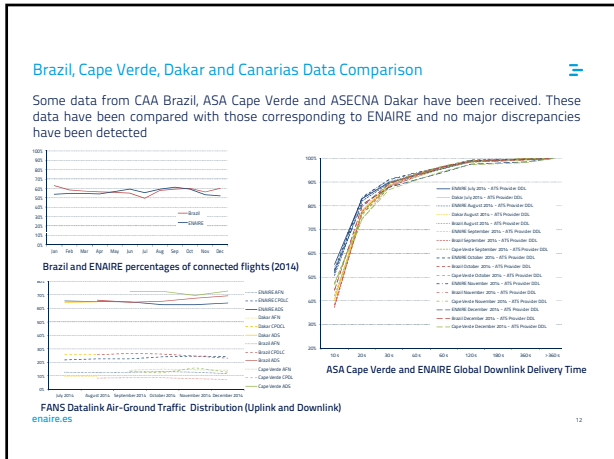
## Potential issues identified (3/3)

### 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 and messages 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

- Almost 96% of flights notifying FANS equipage in its flight plan and more than 56% of the EUR/SAM Corridor flights (Canarias area) connect to SACCAN. It represents a slight increase from 2013
- CPDLC information is interchanged with the vast majority of connected aircraft (about 95%)
- Major users of FANS services are TAP Portugal, Air France, TAM Brazil and Iberia. Same top four than in 2013 but with different order. Air France has gone from third to second position
- The initial ADS contracts established in the Canarias FIR are the most commonly requested contracts
- Position accuracy notified in ADS-C reports is not worse than 0,25 NM (FOM±6) 99,96% of the times
- 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
- Though downlink messages delays have worsened slightly over the year, 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, ASA Cape Verde and ASECNA Dakar 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 2014 some states have provided to ENAIRE some limited data that have been analysed and included as an Annex in the 2014 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:			
<b>CLASSIFICATION</b>			
<ol style="list-style-type: none"> <li>1. Log-On received from aircraft not flying your airspace</li> <li>2. A/C Log-On with incorrect flight identification</li> <li>3. Log-On from Aircraft not declaring ADS capacity in FP</li> <li>4. Unknown ADS messages are received.</li> <li>5. A/Cs remain ADS connected after exiting airspace</li> <li>6. A/Cs remain ADS connected after landing</li> <li>7. Different reports in the same ADS message.</li> <li>8. Identical reports of Waypoint Change received in an ADS message</li> <li>9. CPDLC Message: "Not Current Data Authority"</li> <li>10. Incorrect downlink CPDLC messages have been received:</li> <li>11. Other (describe): _____</li> </ol>			
Crew/Controller comments (if any)			

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

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