International Civil Aviation Organization

ALLPIRG/5-IP/9
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**INFORMATION PAPER**

# FIFTH MEETING OF THE ALLPIRG/ADVISORY GROUP

**(Montreal, 23 – 24 March 2006)**

**Agenda Item 2.1: Framework for global planning**

## GLOBAL USE OF DATA LINK SERVICES FOR AIR TRAFFIC SERVICE APPLICATIONS

(Presented by SITA)

**SUMMARY**

This paper presents a summary of global developments in evolving use of air/ground data link services by air navigation service providers to enable the delivery of enhanced air traffic services. These services include Digital-ATIS, Departure Clearance, FANS 1/A (ADS, CPDLC) and ATN\CPDLC.

Action by ALLPIRG/5 is in paragraph 6.

## 1. INTRODUCTION

1.1 The use of air/ground data link services to enable the exchange of air traffic service application data has been steadily increasing over the last ten years in the majority of regions resulting in increased safety, efficiency and operational benefits. This paper presents a high level summary of the current implementation status of:

- Tower applications (i.e. Digital-ATIS and Departure Clearance)
- FANS 1/A (ADS-Contract and CPDLC)
- ATN/CPDLC

## 2. TOWER APPLICATIONS

### 2.1 Digital-ATIS

2.1.1 D-ATIS implementation enables to significantly improve ATS efficiency by reducing controllers workload: Meteorological data is automatically retrieved and updated on the user interface, while a synthesized voice automatically generates the ATIS message at the controller's request or fully automatically. With D-ATIS, the ATIS information is made available to the pilot in written format, removing the need to transcribe broadcast information from the ATIS frequency.

2.1.2 The data link D-ATIS service eliminates the risk of misunderstandings due to poor VHF voice quality, hence improving safety. As well, the D-ATIS information can be accessed via satellite data link in areas outside VHF coverage, providing worldwide coverage.

2.1.3 Appendix A provides a list of airports at which D-ATIS services are currently available.

### 2.2 Departure Clearance

2.2.1 The implementation of Datalink Departure Clearance (DCL) eliminates potential misunderstandings due to VHF voice, hence enabling the ATC to provide a safer and more efficient service to their users.

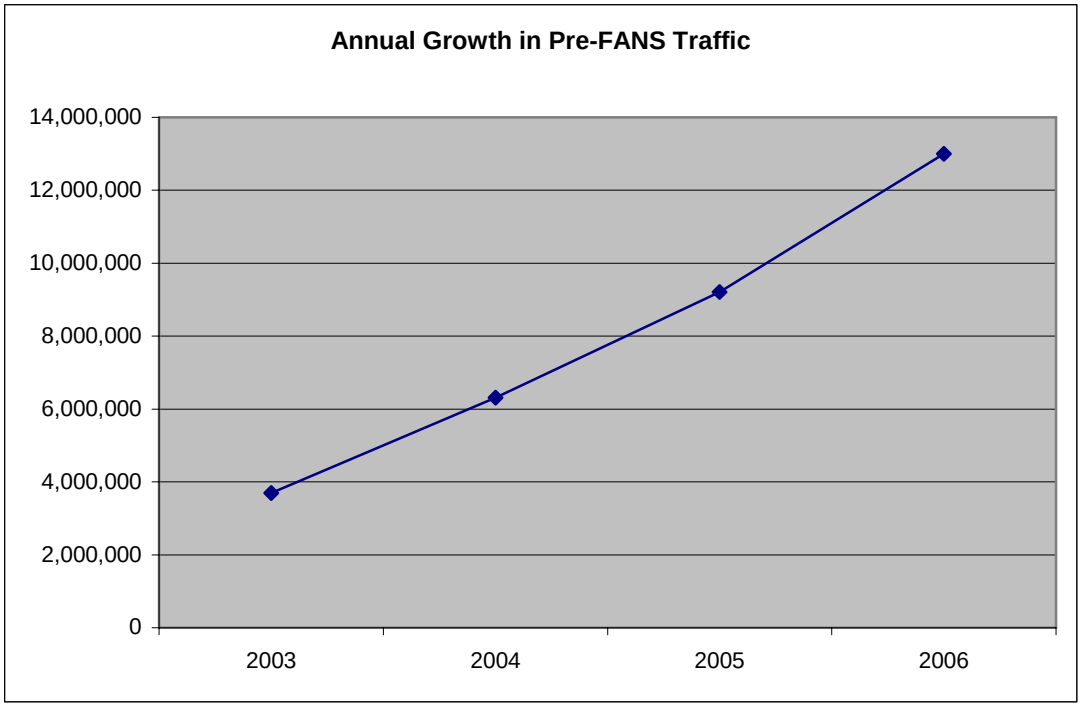
2.2.2 On the pilot side, the use of a data link service provides de-synchronization of the DCL procedure: the pilot can request his clearance and then continue to prepare for the flight instead of monitoring the ATC frequency. For busy airports, the use of DCL data link results in a significant decrease in ATC tower frequency congestion.

2.2.3 Appendix A provides a list of States at which D-ATIS services are currently available.

### 2.3 Aircraft Equipage and Traffic Growth

2.3.1 Globally it is estimated that there are approximately 10,000 aircraft equipped with ACARS avionics that are either currently, or could be enabled, to access the Digital-ATIS and Departure Clearance services.

2.3.2 The graph below illustrates the very high year on year annual growth (circa 50% per annum) in the air/ground traffic associated with these services clearly indicating the value that is provided to participating air navigation service providers and airspace users.




**GRAPH 1 – GROWTH IN D-ATIS AND DCL ("PRE-FANS") AIR/GROUND DATALINK TRAFFIC**

## 3. FANS 1/A (ADS AND CPDLC)

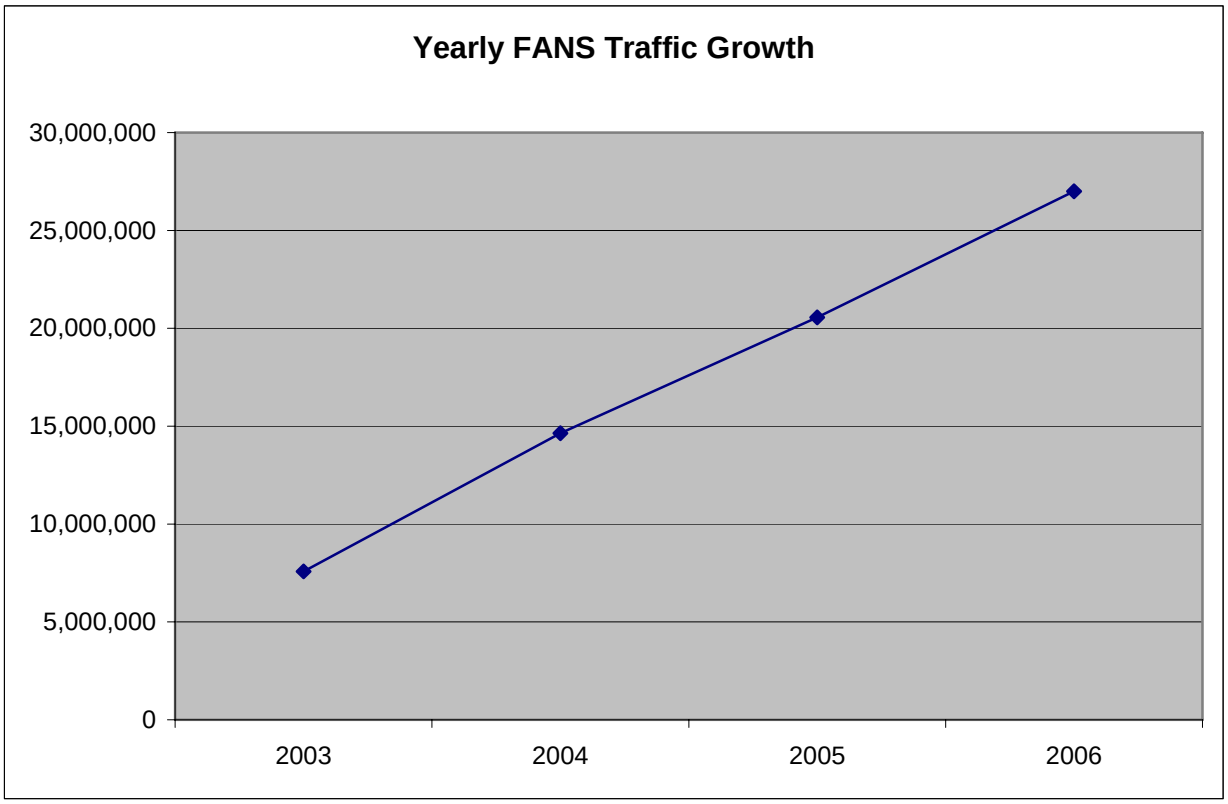
3.1 FANS 1/A was originally introduced in the South Pacific region in the mid 1990's by the Informal South Pacific ATS Co-ordinating Group (ISPACG) to primarily overcome the well known limitations of using HF voice for communications and way-point position reporting. The technology has been delivering operational benefits including enabling 30-30 separation in some areas.

3.2 As a result of the positive benefits derived in the South Pacific region the expansion of FANS technology has spread across all oceanic and most remote terrestrial regions including the North Pacific, Bay of Bengal, South China Sea, North Asia, Middle East, North Atlantic and South Atlantic regions. The level of implementation varies from the most advanced use in the Pacific and North Atlantic regions to trials and evaluations being conducted in the South Atlantic and Middle East regions.

3.3 According to industry estimates there are over 1,500 long haul aircraft equipped with the FANS 1/A avionics package and this number is set to continue to rise with the majority of new aircraft deliveries.

3.4 Appendix A lists the States that will shortly, or have implemented, FANS 1/A technology.

3.5 The graph below illustrates the very high year on year annual growth (circa 50% per annum) in the air/ground traffic associated with FANS 1/A services clearly indicating the value that is provided to participating air navigation service providers and airspace users.




**GRAPH 2 – GROWTH IN FANS 1/A (ADS, CPDLC) AIR/GROUND DATALINK TRAFFIC**

## 4. ATN/CPDLC IMPLEMENTATION

4.1 A number of European States, within the frame of the Eurocontrol Link2000+ Programme, have initiated implementation plans to introduce ICAO standardised CPDLC services over an ICAO standardised ATN\VDL Mode 2 communications infrastructure.

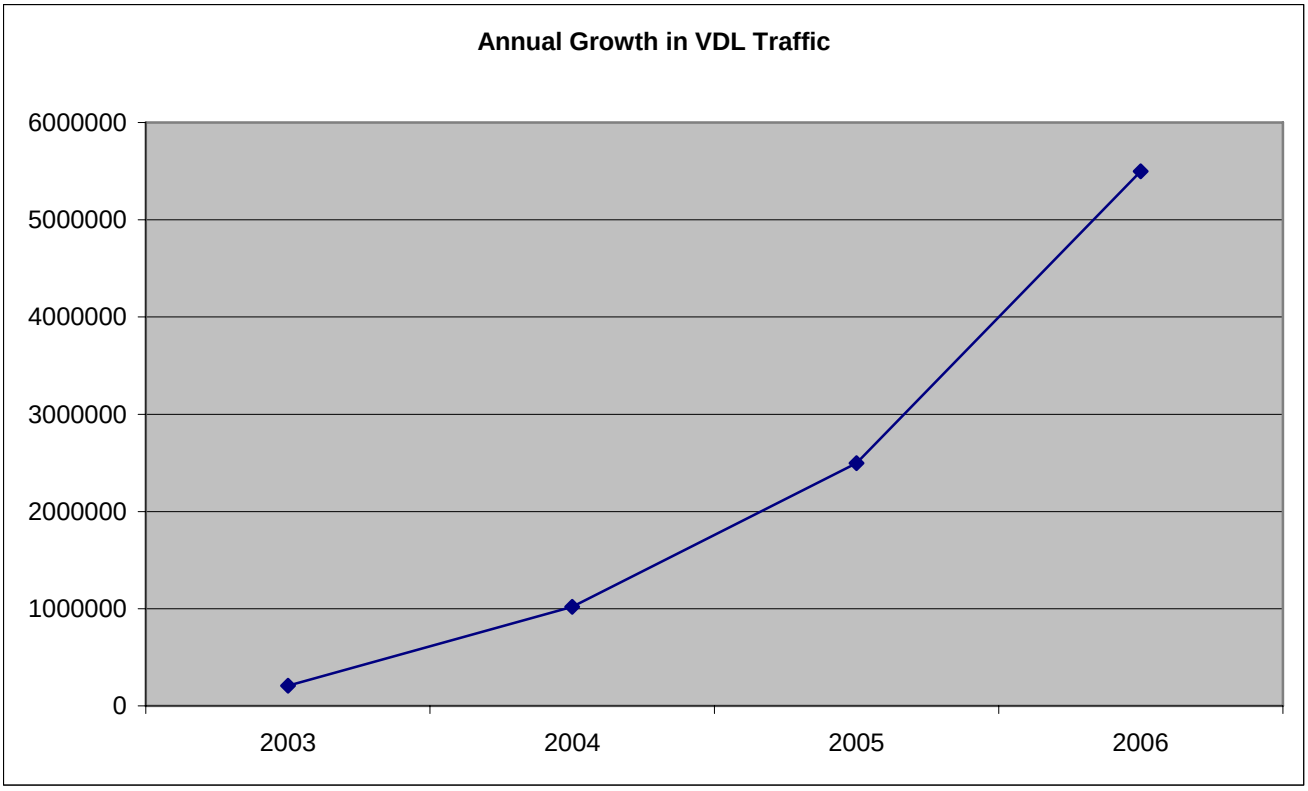
4.2 The primary driver of this implementation programme is to reduce air traffic controller R/T workload that would result from the use of CPDLC for non-routine communications. A number of airlines have, or are committed to equip, their aircraft with the required CPDLC\ATN\VDL Mode 2 avionics over the coming year which are available on both Boeing and AIRBUS aircraft types.

4.3 The SITA implementation of VDL Mode 2 services throughout Western Europe was initially driven by the increased bandwidth demanded by Aeronautical Operational Control (AOC) applications. The VDL Mode 2 deployment is now being further driven by the Link2000+ programme and has resulted in total VDL Mode 2 service coverage throughout Western Europe above flight level 245.

4.4 The SITA ATN service has now been operational for over two years and is currently providing access to the Eurocontrol Maastricht Upper Area Control Centre to enable the exchange of ATN/CPDLC services between this centre and equipped aircraft.

4.5 Appendix A lists the States and airlines that are currently committed to the Link2000+ programme.

4.6 The graph below demonstrates the high growth currently being experienced in VDL Mode 2 communications, albeit the majority of which is AOC communications today.




**GRAPH 3– SITA VDL MODE 2 TRAFFIC GROWTH**

## 5. ICAO PIRG RECOMMENDATIONS CONCERNING USE OF DATA LINK FOR AIR TRAFFIC SERVICES

5.1 The 14th meeting of the APANPIRG (August 2003) identified the need to include the implementation of Digital-ATIS and Departure Clearance services via data link into the list of key priorities for CNS/ATM implementation based on the benefits identified.

5.2 The MIDANPIRG CNS/ATM/IC-SG/2 meeting (March 2005) drafted a conclusion (2/1) as follows: “That MID States, not having done so, and where needs justify, are urged to implement in their international airports the dissemination of the ATIS and Pre-Departure Clearance via data link (D-ATIS and PDC).

5.3 The twelfth Meeting of the CAR/SAM Regional Planning and Implementation Group **(**GREPECAS/12), held in June 2004, has concluded that the CAR/SAM States/territories/international organizations and users, based on ICAO existing recommendations, to the cost/benefit aspects and considering the existence of technology installed in ground and on board aircraft, should continue with

the implementation of the applications feasible to be used with ACARS data and FANS 1/A during the transition towards the implementation of ATN. (Conclusion 12/42 – Final Report)

## 6. ACTION BY ALLPIRG

6.1 The ALLPIRG/5 Meeting is invited to note the increasing global developments in air/ground data link implementation in support of air traffic services.

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# APPENDIX

## GLOBAL USE OF DATA LINK SERVICES FOR AIR TRAFFIC SERVICE APPLICATIONS

### 1. INTRODUCTION

1.1. This Appendix lists the States that have, or are planning to introduce, air traffic service applications requiring the use of data link services."

1.2. Departure Clearance and Digital ATI

| **Departure Clearance**<br>118+ Airports | **Digital ATIS**<br>210+ Airports |
|---|---|
| Australia | South Africa |
| China | Egypt |
| Korea | Nambibia |
| Singapore | Kuwait |
| Belgium | Australia |
| Denmark | New Zealand |
| France | Canada |
| Germany | USA |
| Ireland | China |
| Netherlands | Japan |
| Norway | Korea |
| Spain | Philipinnes |
| Sweden | Singapore |
| Switzerland | Taiwain |
| Spain | Thailand |
| United Kingdom | Bahrain |
| Brasil | UAE (Dubai) |
| Canada | Austria |
| USA | Belgium |
| | Denmark |
| | France |
| | Finland |
| | Germany |
| | Greece |
| | Ireland |
| | Netherlands |
| | Norway |
| | Portugal |
| | Spain |
| | Sweden |
| | Switzerland |
| | United Kingdom |

1.3. **FANS 1/A**

| **ASIA/PACIFIC** | **NORTH AMERICA** |
|---|---|
| Australia | USA |
| Tahiti | Canada |
| New Zealand | |
| Fiji | **EUROPE** |
| Indonesia | |
| Thailand | EUROCONTROL Maastricht Upper Airspace |
| Singapore | Spain |
| Vietnam | Portugal |
| Philipinnes | France |
| China | Iceland |
| India | United Kingdom |
| Myanmar | |
| Sri Lanka | **SOUTH AMERICA** |
| Maldives | |
| Japan | Chile |
| Russia (Far East) | Brasil |
| Mongilia | Argentina |
| **MIDDLE EAST** | **AFRICA** |
| Iran | Senagal |
| Egypt | Chad |
| Saudi Arabia | Congo DRC |
| Lebanon | Madagascar |
| | Angola |
| SomaliaNiger | Algeria |
| | South Africa |
| | Mauritius |
| | Cape Verde |

1.4. **ATN/CPDLC**

| **European States** | **Pioneer Airlines equipping with ATN/CPDLC** |
|---|---|
| Ireland | Aeroflot |
| France | Lufthansa |
| Spain | Air Europa |
| Portugal | FEDEX |
| Italy | SAS |
| Switzerland | Hapag Lloyd |
| Austria | Air Berlin |
| Germany | ATI |
| United Kingdom | Finnair |
| | American Airlines |

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