European and North Atlantic Office

TRANS-REGIONAL AIRSPACE AND SUPPORTING ATM SYSTEMS STEERING GROUP

FIRST MEETING

(TRASAS/1)

(Paris, 2-3 May 2007)

Agenda Item 3: Review of work currently underway to enhance the ATS route network, using current and future technologies, and the need to plan for a transition towards a performance based navigation system

Communications, Navigation and Surveillance (CNS) issues

(Presented by the Secretariat in support of Strategic Objectives No. A and E)

1. Introduction

1.1 Provision of a civil aviation safety and efficiency along Polar routes represents a challenging issue requiring coordinated and harmonised efforts of all involved parties. However, the issues peculiar to the Polar routes are not entirely unique and similarities could be traced in other regions as well. In particular an experience gained in oceanic airspace of the ICAO NAT and ASIA/PAC regions would be considered of useful value to utilize.

1.2 Important contributing factors helping to resolve the issues in these regions are application of the data links and satellite communication technology. These technological enablers are widely applied since beginning of 90s in oceanic airspace and were partly introduced into polar routes ATS provision in Magadan UIR. Further expansion of such system to cover other parts of the Polar routes would be beneficial for both air space users and air traffic services providers in the region. That would foster further consolidation of air traffic service centres and reduce costs for deployment and maintenance of the conventional ground system.

2. Discussion

2.1 There are two distinct air/ground data links deployed at present: ATN and FANS 1/A based.. Although both systems provide for at large similar functionalities, there are still significant divergences among them preventing seamless operation of ATN and FANS equipped aircraft across regions. However, the users in oceanic airspace and aircraft manufacturers historically have given their preferences to the FANS based data links. Vigorous actions are taken by various ICAO leaded groups to prevent further divergence and ensure data links convergence. These activities have resulted in the increased awareness over the issue, agreed measures to halt divergence and to define convergence path.

2.2 As a matter of fact majority of oceanic airspace users are equipped and utilizing FANS 1/A founded data link. The current global coverage of FANS 1/A data link is depicted at the chart at Appendix A. As derived from the chart large parts of Atlantic, Pacific and Indian oceans are covered by FANS 1/A compliant system taking advantages of CPDLC and ADS-C application.

2.3 The induced operational benefits are the following but not limited to:

- use of controller-pilot data link communication instead of voice communication;
- use of automatic dependent surveillance position reporting in place of voice position reporting;
- separation assurance at 30/30 NM lateral and longitudinal;
- route and flight level conformance monitoring;
- facilitation of in-flight rerouting and weather avoidance;
- tailored arrival procedures;
- in trail climb and descent, and;
- Strategic lateral offset procedures.

2.4 The implementation and development of data links in ICAO NAT region is monitored by ICAO NAT FANS implementation Group (FIG). The current status of deployment is that all Oceanic UIR's are using ADS-C waypoint reporting and CPDLC. The final 4th phase of CPDLC implementation that supports all ICAO compliant CPDLC messages will be proceeded by the end of 2007.

2.5 Mandatory carriage of data link equipment in NAT region is envisaged from 2015 onwards. The percentage of data link equipped aircraft that actually uses ADS-C/CPDLC currently amounts to 75 % of the total traffic.

2.6 The SATCOM voice is permitted for non-routine ATS communication in NAT region and the intention is to mandate it for routine ATS operations shortly, subject to safety case study and trial validation. Eventual target is to achieve CPDLC data link as a primary means of communication with SATCOM or HF voice back up.

2.7 FANS interoperability teams are established in ICAO ASIA/PAC region to coordinate and monitor data link implementation in North/Central Pacific, South Pacific, Bay of Bengal, Indian Ocean and Arabic Sea areas. Various degrees of implementation have been realised with ultimate target for full and harmonised ADS-C/CPDLC utilization.

2.8 Although FANS 1/A data link relies either on SITA or ARINC provided networks communicating through Inmarsat satellite. it is possible to use different satellite system. For example Japan Civil Aviation Bureaux (JCAB) utilises MTSAT constellation thus improving system reliability.

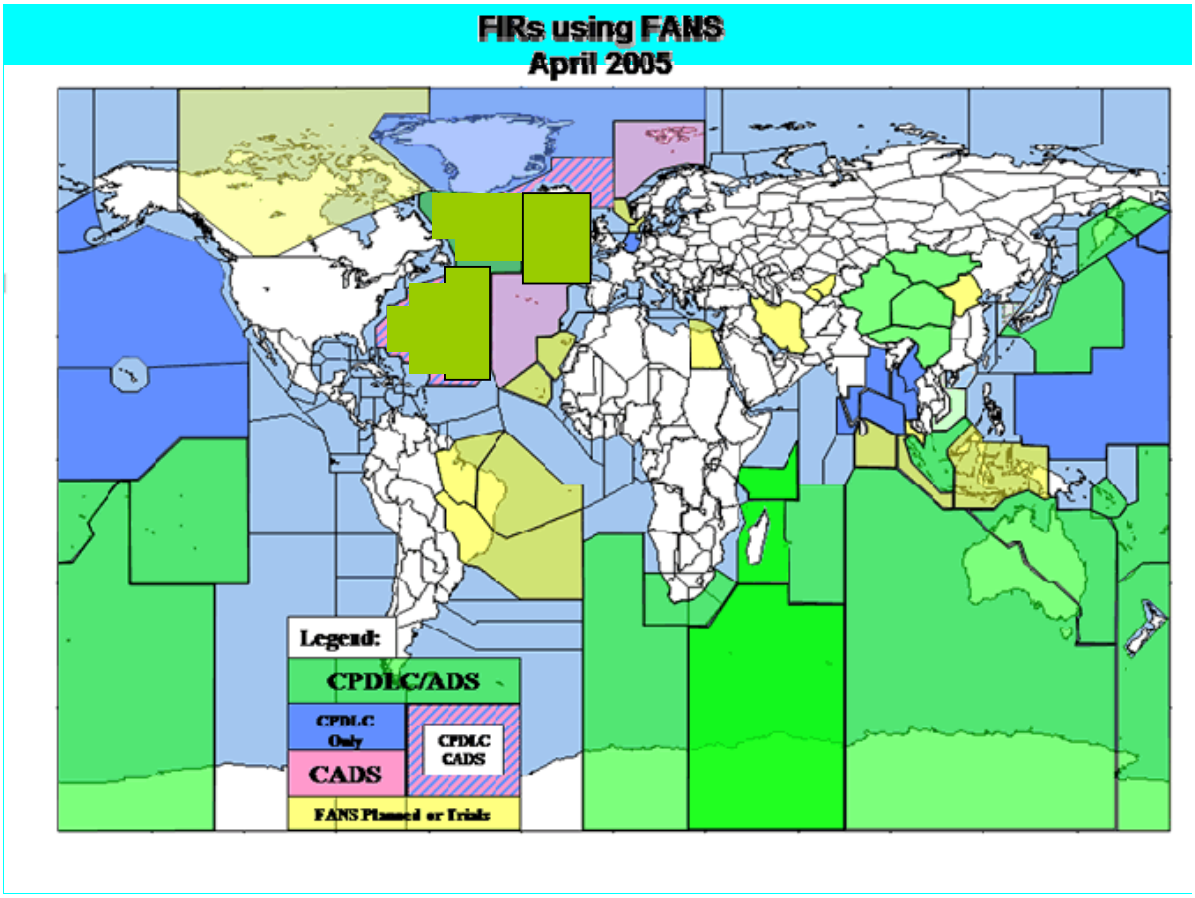
2.9 Positive results were also received from ADS-C/CPDLC implementation in the Russian federation's Magadan UIR providing air traffic services in oceanic airspace along Polar routes 3 and 4. The expansion of this system across other UIR's providing services along Polar and Trans-Siberian routes would result in significant benefits in terms of improved safety and efficiency. That would also foster Russia's ATC centers consolidation programme and reduce initial investments and maintenance costs for ground ATC systems.

3. Action by the Steering Group

3.1 The Meeting is invited:

- note the information presented in this paper and discuss the ways for further coordinating of the data link implementation along the Polar routes

Appendix


FIRs using FANS
April 2005
Legend:
CPDLC/ADS
CPDLC Only
CPDLC CADS
CADS
FANS Planned or Trials