International Civil Aviation Organization

ATN Seminar and Third ATN Transition Task Force Meeting

Singapore, 26-30 March 2001

Agenda Item 6: Planning and Implementation Considerations

SITA AIRCOM ATN SERVICES

(Presented by SITA)

SITA AIRCOM
ATN Services

ICAO ATN Seminar
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Future of SITA Datalink

- The need for ATN
- Capacity - VDL
- Implementation Schedule
- SITA ATN Services
- Conclusions

The need for ATN

- To meet the predicted increase in aircraft movements ATS Providers seek affordable and sustainable growth in airspace capacity to meet (reducing) delay targets
- Increased air traffic will be supported by migrating from voice to data comms, leading to an increase in ATC data link
- Harmonisation of airline data applications and those of ATC data link applications, including avionics and ground system elements

The need for ATN

- Airlines Seek:
  - Increase operational efficiency,
  - Increase operational flexibility,
  - To take advantage of increased aircraft automation
- Airlines need a single, global standard to ensure that the same avionics can be used world-wide
- Focus on data link applications, airspace efficiencies, technology harmonisation, costs and benefits to airlines and ATS providers

ATS Provider Schedule for Implementation of ATN Applications

- The earliest plan to implement operational ATN CPDLC service is the FAA CPDLC Build 1 in July 2002
- The FAA will start certifying the ATN CPDLC avionics in 2002, but it will take several years for the avionics to be installed in a significant proportion of the airline fleet.
- In Europe, the Eurocontrol Maastricht ATC centre plans to implement ATN CPDLC in 2002 but no other centre has a firm plan so they could not have CPDLC in service before 2004.

Why SITA involved in ATN?

- SITA is involved in the ATN due to the significant role we play in service delivery of airline and ATS applications today.
- This includes:
  - ➔Extensive infrastructure aga and telecommunications
  - ➔Extensive application delivery for airline operations
  - ➔Extensive application delivery of ATC data link
  - ➔World-wide civil aviation service provider

Why SITA involved in ATN?

SITA is developing ATN systems to :

- ➔ **ensure we keep up technologically**
- ➔ **have the opportunity to influence world-wide ATN implementation choices**
- ➔ **minimise future transition costs**
- ➔ **be ready when airlines require ATN service.**
- ➔ **maintain AOC service as customers move from ACARS to ATN;**
- ➔ **advance the generation of operational benefits and optimise the overall Air Traffic Service efficiency.**

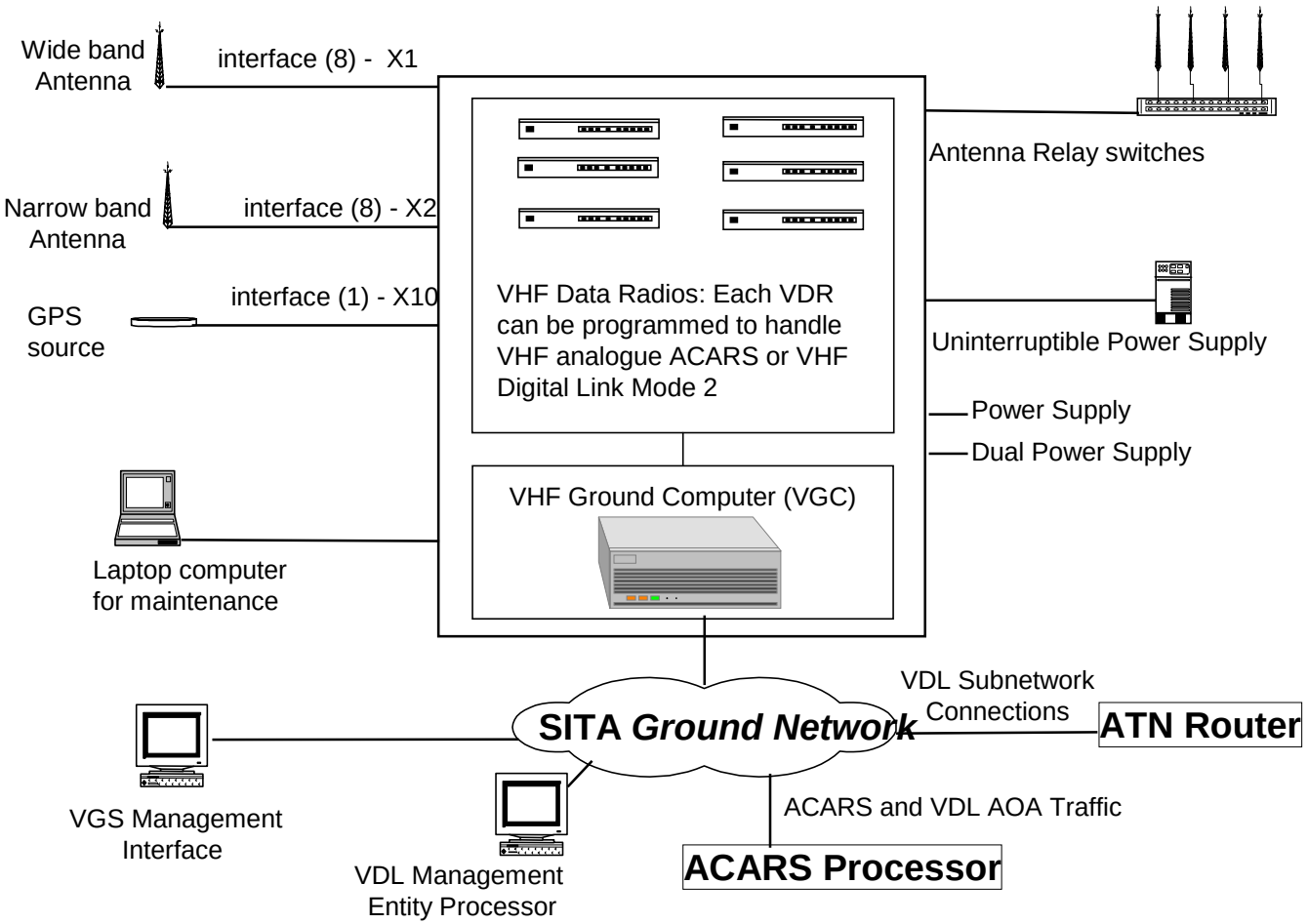
SITA ATN Routing Services

- SITA developed an ATN Router as a partner in ProATN from 1995-2000 and in the previous EurATN project from 1990-1995.
- SITA has issued an RFP for a production ATN routers to provide operational service.
- The SITA ATN service will be available in early 2002 - before the first operational implementation of ATN CPDLC in the FAA CPDLC Build 1.

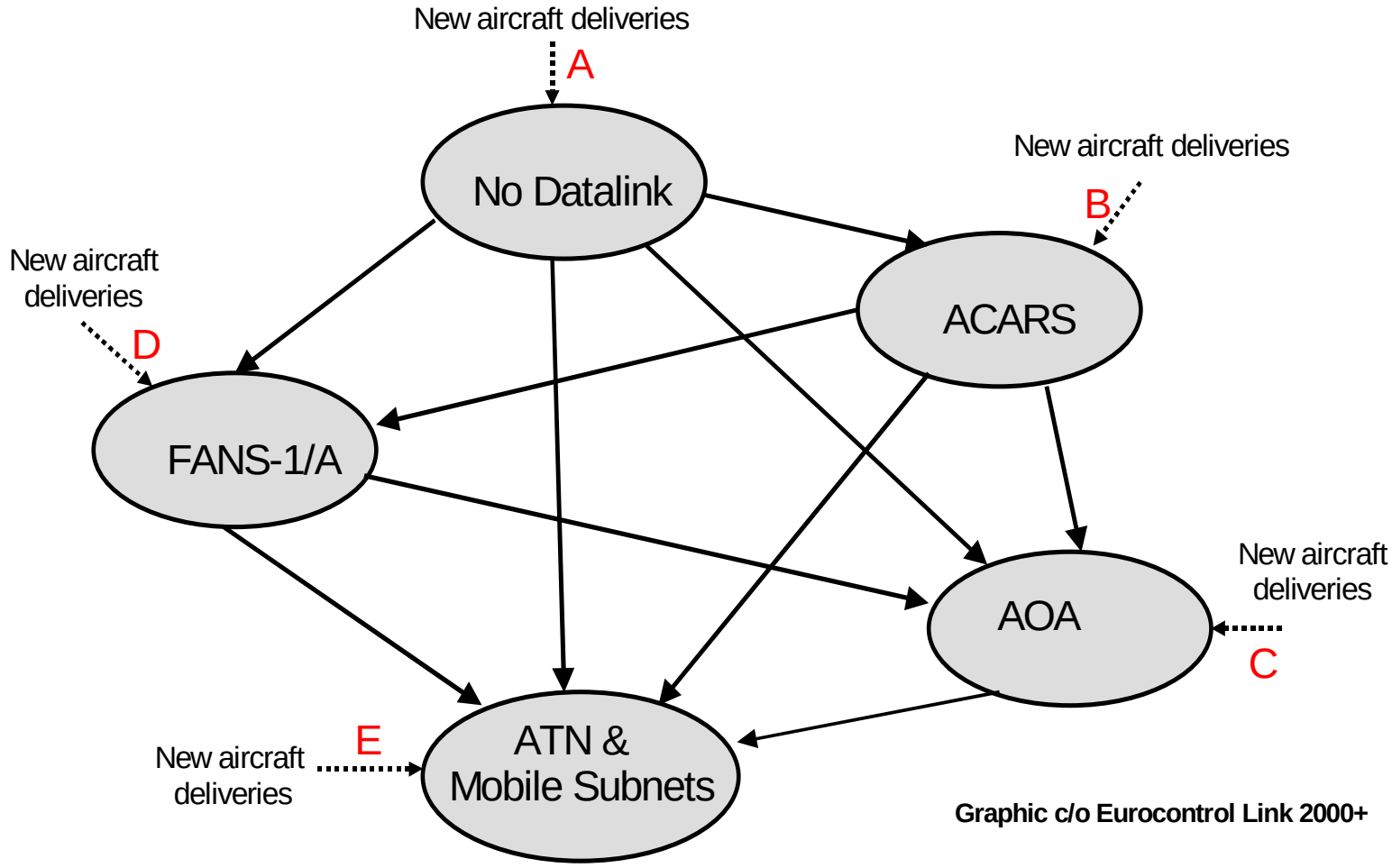
SITA ATN Sub-network Services

- The SITA Satellite AIRCOM service support for ATN communications has been demonstrated in the ADS Europe project.
- SITA has acquired a new VHF AIRCOM ground station that will support ATN/VDL sub-network service, and maintain VHF analogue service.
- The SITA VDL ground station will also support the use of the AVLC protocol specified in the ICAO VDL standard for the exchange of ACARS messages. The AEEC has specified this ACARS over AVLC (VDL AOA) service.

SITA VDL Ground Station Architecture



Avionics Transition from ACARS to ATN



Graphic c/o Eurocontrol Link 2000+

SITA VDL Objectives

- SITA is implementing VDL to increase data link capacity in the VHF band:
  - Aircraft that implement VDL Mode 2 will obtain VHF link performance 10 times better than VHF analogue ACARS
  - A 250 character ACARS block will take about 0.06 seconds to cross the VDL Mode 2 link instead of 0.83 on the VHF analogue link
  - Improvement in the RF robustness of VDL over ACARS
  - For aircraft using VDL AOA, the VHF link transit time be a negligible factor in the end to end performance

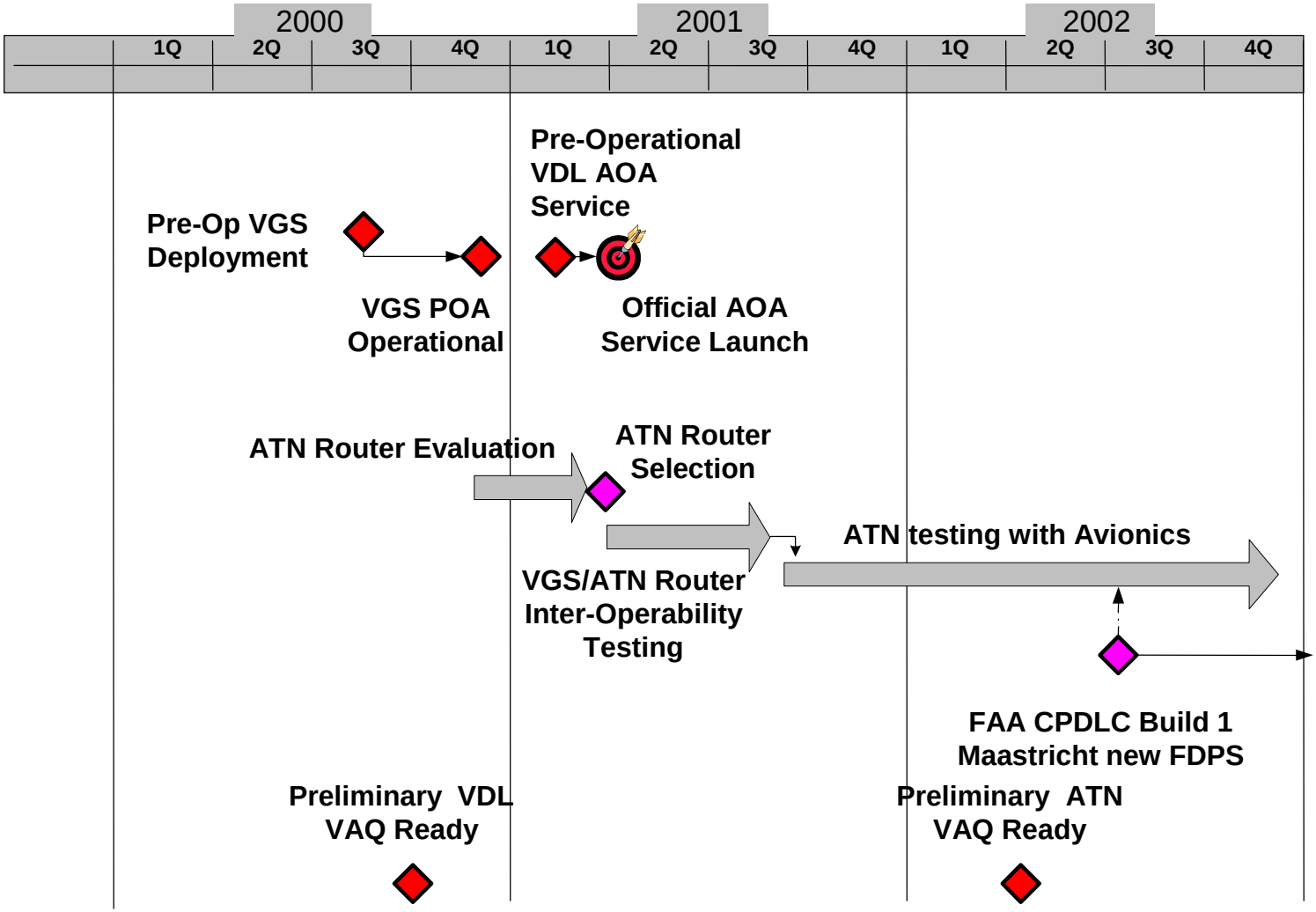
SITA VDL AOA Implementation

- The implementation of ACARS over AVLC (VDL AOA) service has the following components:
  - The VGS is made up of a VHF Data Radio that processes the VDL D8PSK physical layer and a computer that processes the Aviation VHF Link Control (AVLC) protocol specified in the ICAO VDL standard.
  - The service requires no major modifications to SITA ACARS processor because aircraft use the same ACARS message formats over VDL AOA links as over VHF analogue links.
  - SITA will implement the VHF Management Entity (VME) processor to manage the VDL links.

SITA VDL Achievements

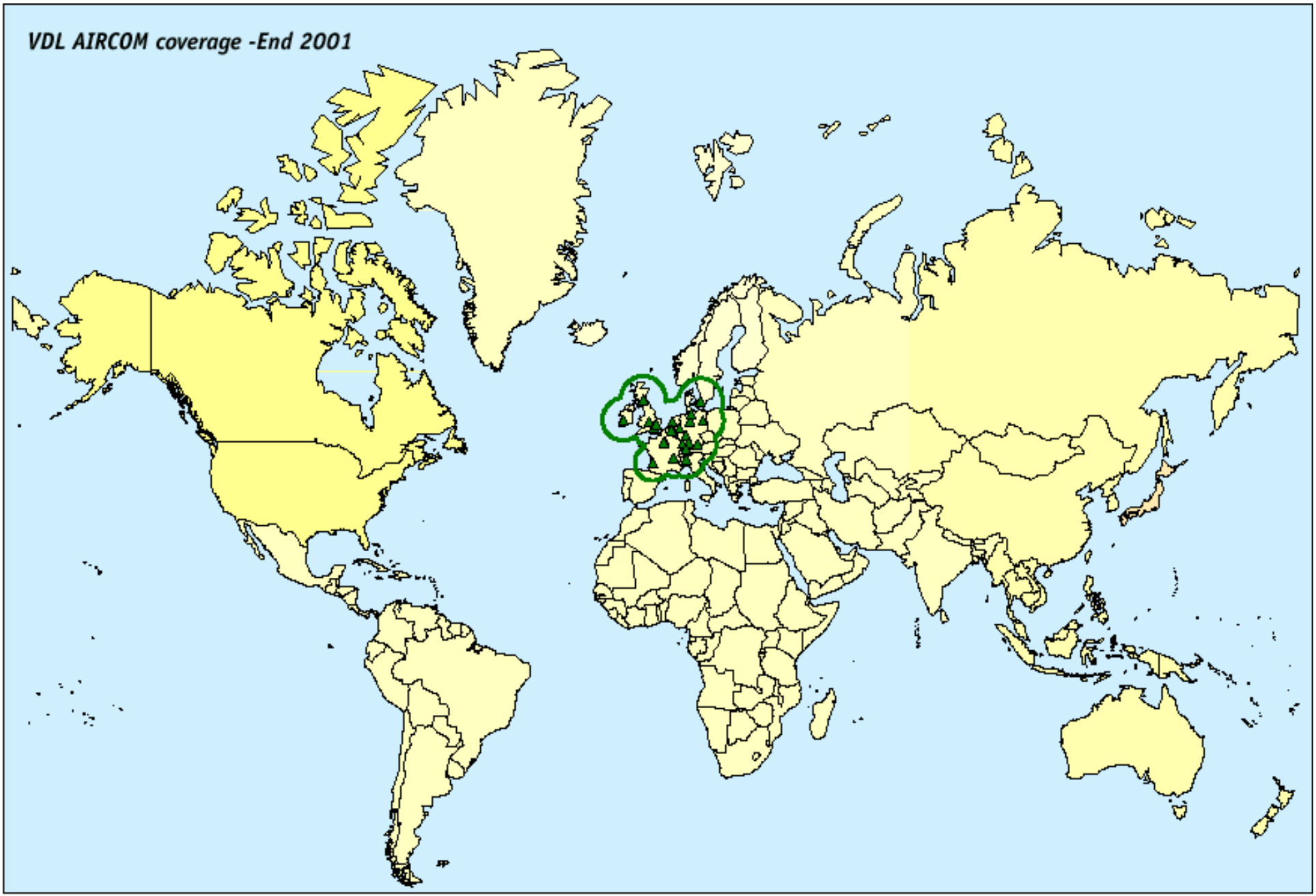
- Dec 2000 => Implement preliminary VDL Avionics Qualification capability
- Nov 2000 => VDL ground system validation
- Dec 2000 => VGS Service Cut-over (analogue)
  - PAR and GVA already operational since Nov./Dec. 2000
  - ORY and AMS to follow in Feb. and Mar. 2001
- Oct 2000 => Interoperability testing between VDL avionics and VGS successfully performed at the SITA Montreal test bed
- Jan 2001 => VGS installed at Rockwell Collins, Cedar Rapids for testing in the lab and with test aircraft

SITA VDL/ATN Roadmap



SITA VDL/ATN
Future Milestones

- Mar 2001 => Pre-Operational VDL AOA
- May 2001 => Official AOA Service Launch
- 1Q 2001 => ATN Router Evaluation & Selection
- 3Q 2001 => VGS/ATN Inter-Op Testing
- End-2001 => Implementation of ATN Routing Service with GACS capability
- 1Q 2002 => SITA validate the VDL Mode 2 link performance in the Eurocontrol EuroVDL Project with partners DFS, ENAV, NATS and STNA and AIRBUS.



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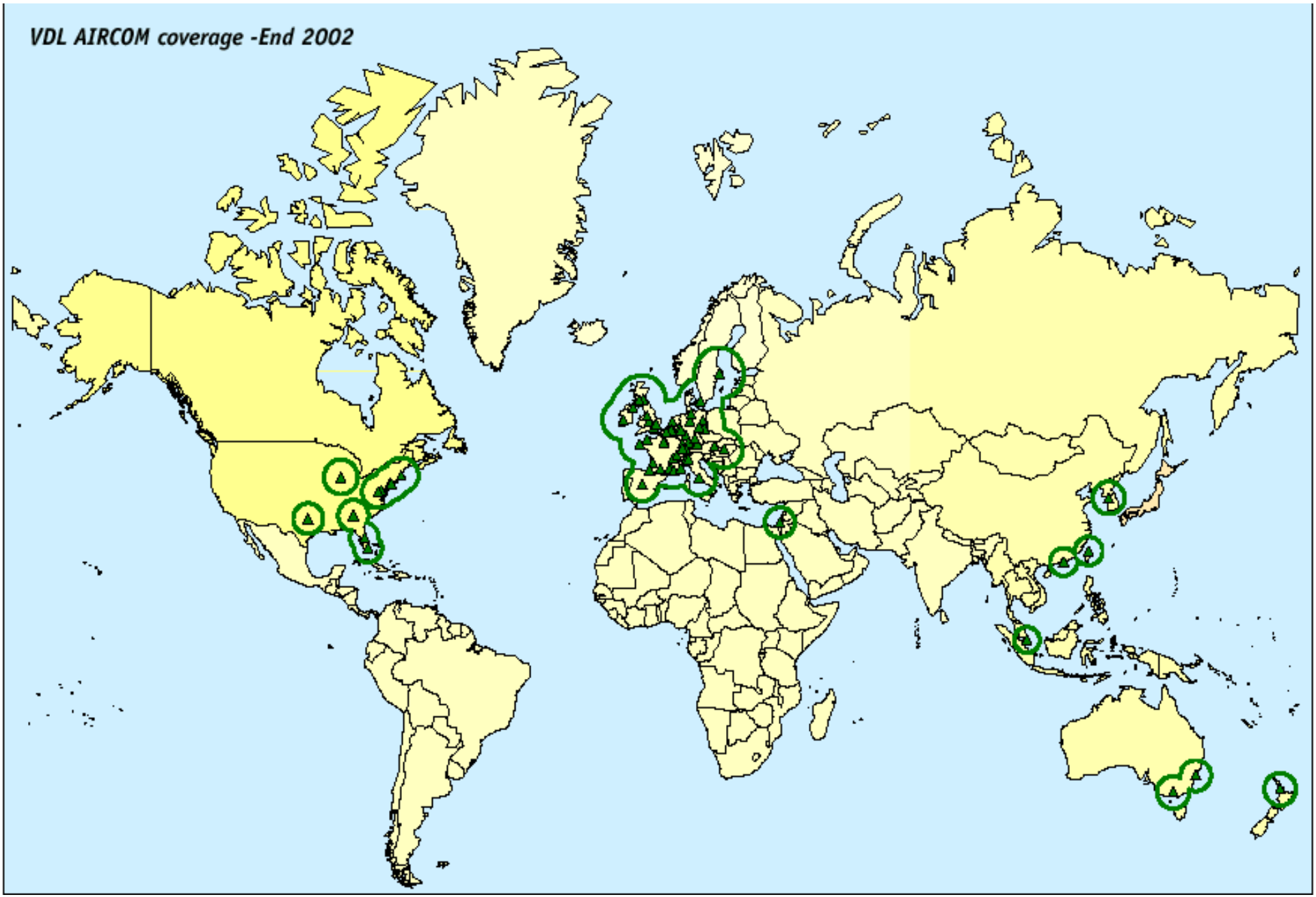
THE SKY IS NOT THE LIMIT



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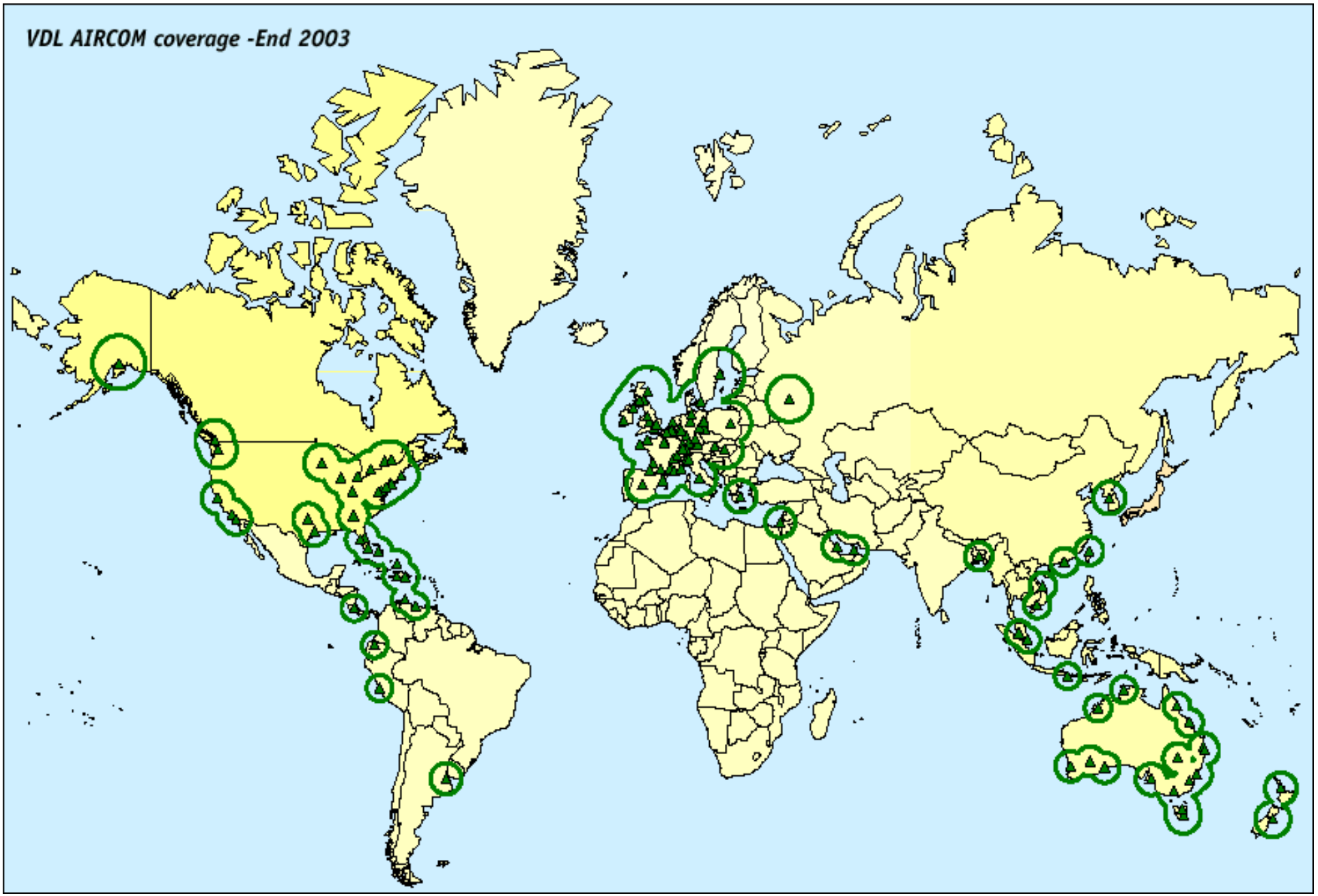

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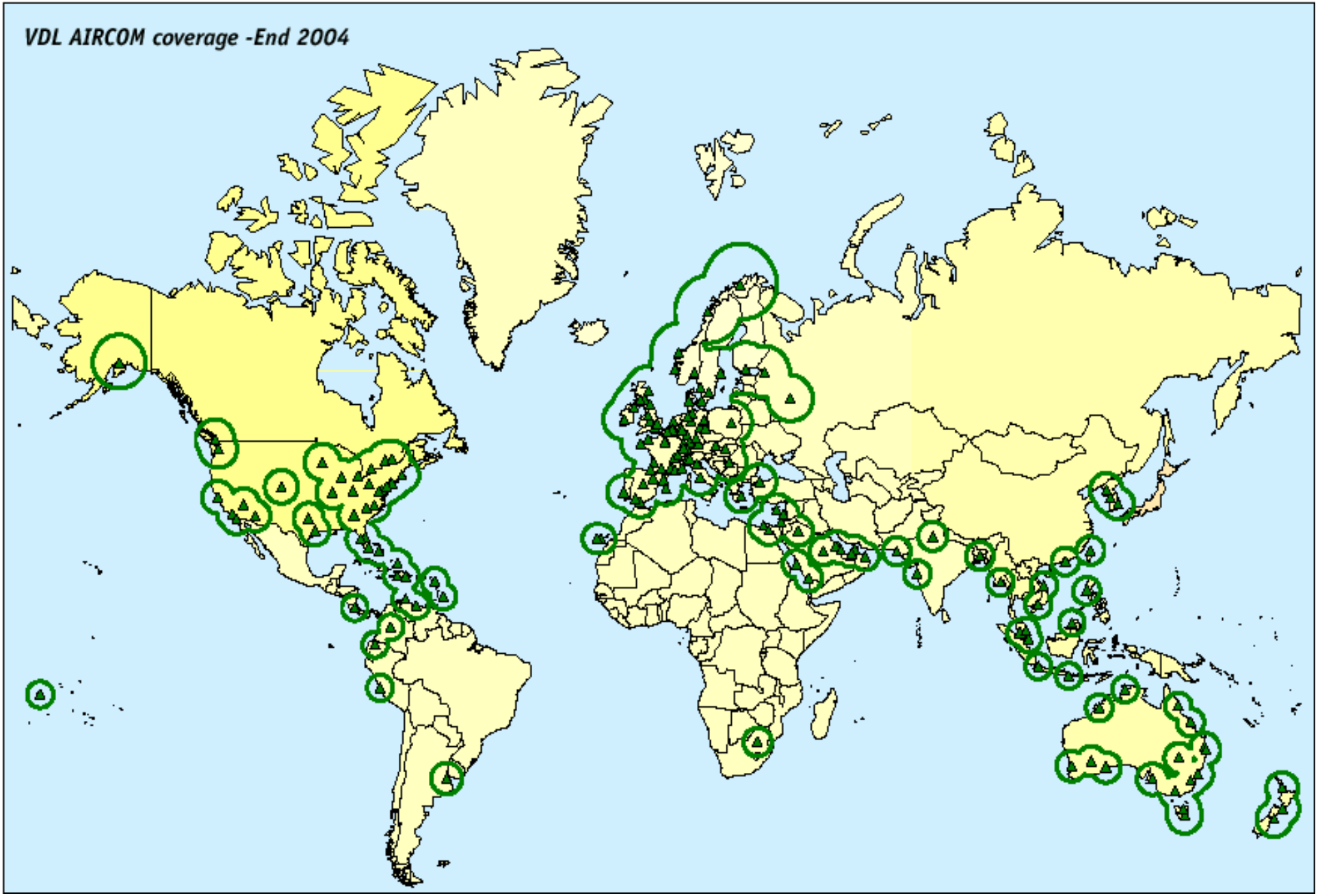

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THE SKY IS NOT THE LIMIT

Conclusions

- ATC agencies are implementing ATN data link applications to meet the increasing demand from the airlines for airspace capacity.
- SITA will support this objective by enabling data link services to be offered to the widest possible range of data link equipped aircraft.
- SITA is well under way in its ATN transition with VDL Mode 2 implementation, ATN router development and is ensuring harmonisation with airline avionics development.