Benefits of CNS/ATM Implementation for the Region

to represent, lead and serve the airline industry
IATA today
www.iata.org

- 227 Airline Members from 143 countries accounting for 94% of total international traffic
- 200 partners
- Representation in 90 countries
- 1500 staff
NAVAIDS Transition Roadmap
Communications infrastructure is gradually being enhanced

Inter-unit ground-ground communications are being phased to Internet protocols. New protocols for communication are in development with action targets of 2012-2015

As data-link applications mature, there will be a natural evolution to more data and less voice
CNS/ATM Communications

- VDL Mode 2 - offers the best short to medium term communications infrastructure for controller-pilot data-link communications (CPDLC). IATA supports continued implementation of VDL mode 2

- Data-link is already used extensively by airlines for Aeronautical Operational Control (AOC)
CPDLC

- In suitable operational environments, CPDLC is preferred to voice communications as it helps to eliminate misunderstanding associated with voice comms
- Airlines: Equip aircraft
- Equipment manufacturers: Charge a fair price
- Airframe manufacturers: Charge reasonably for retrofit
- Communication S.P.: Provide an equitable service
- ANSP: Transparent charging scheme
Growing number of LATAM/CAR air transport aircraft are equipped with GNSS coupled to FMS with INS/IRS.

Many of these aircraft are capable of meeting RNAV and RNP criteria.

Most of these aircraft can navigate with minimum reliance on ground NAVAIDS.
CNS/ATM Surveillance

- PSR: No longer required for ATM services
- PSR: May be needed for safety mitigation in some terminal areas
- SSR: ADS-B OUT is the preferred option
ADS – C

- Oceanic and Remote Airspace
- Data-link “Contract” between ATC and pilot
  - FMS derived position reports (IRS + GNSS)
    - (present position, next position, next + 1 position)
    - Usually given every 15 - 27 minutes
    - Displayed on scope similar to radar
  - Contract position report could include weather information (winds/temp)
ADS – B

- One second return rate (8 times more than average radar)
- Two variants; ADS-B OUT and ADS-B IN
- Facilitates radar like separation of 3-5 nm
- Operational since 2005.
CNS/ATM: Surveillance

Automatic Dependent Surveillance Broadcast “Out”

Position, Altitude, ID (call sign) velocity vector, etc.
CNS/ATM: Surveillance

Everyone sees each other.

Note: airlines still evaluating the business case for ADS-B IN.

Enhanced “see & avoid” Air-Air Surveillance

- Display on TCAS or other display
- Longer range than TCAS
- Can include velocity vector & identity

- Display on MFD or PDA
- 1090Rx (not yet available)
ADS-B ground stations cost 1/10\textsuperscript{th} the price of traditional radar

**ADS-B**

\~ $100K-$400K USD

**RADAR**

\~ $1M - $4M USD

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<th>Cost Comparison</th>
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Radar, ADS-C and ADS-B and the Air Traffic Controller’s Display

Radar Tracks

ADS - B tracks

DIFFERENT SYMBOLS

ADS- C tracks
IATA Position

- Recognizes ADS-B as a prime enabler of ATM applications
  - Safety and capacity benefits
- Supports the cost-effective implementation of ADS-B
- No adequate ground based surveillance is available in many areas of the world
  - ADS-B can provide a cost effective surveillance solution
- CNS vision includes: RNP, GLS, ADS-B
Implementation Issues

- Early benefits of ADS-B “OUT”
- Unwise to pursue ADS-B “IN” (CDTI) at this time
- CDTI should be on next-generation airplanes
- Most fleets have 1090 ES (LATAM)
  - Rest will have it soon
- IATA is grateful for Australia’s pioneering work on developing a benefits-driven implementation plan for ADS-B “OUT”
Regional Benefits

- Increase capacity
- Increase schedule flexibility
- Increase flight path efficiency
- Reduce disruption (delays, diversions and cancellations) due to congestion in the Gulf
- Provide increased route flexibility for traffic during convective weather events
Gulf of Mexico - Savings

MIA-MEX Savings

- 33 NM (vs. A509)
- 53 NM (vs. B646)
- USD 3.4M/yr
ADS-B Coverage
ADS-B Datalink Selection

- Mode S Extended Squitter (1090 ES) to be used as the single, interoperable data link for ADS-B in the near term.
- 1090 ES is available, mature technology, enabling early implementation.
- Boeing, Airbus, CANSO support 1090 ES.
- IATA recognizes that a link with greater performance will be required in the future.
- This selection must be made purely on application performance requirements and return on investment.
  - not political considerations.
Next Steps

- Develop an ADS-B OUT implementation plan to include:
  - identifying sub-regional areas where there is a positive cost/benefit for near-term implementation
  - standardized and systematic task-list approach to implementation
  - educational seminars for regulators, ANSPs and operators

- Near term ADS-B datalink selection
  - 1090 ES
CNS/ATM: Air Traffic Management

Difference between ATC and ATM

- ATC is concerned with the separation of aircraft
- ATM focuses on efficient management of the airspace
- ATC plus air traffic flow management plus airspace management plus a special emphasis on flight efficiency and fuel conservation.
Practical Elements of ATM

- Reduced Separation
- Flexible instead of Fixed Tracks
  - Daily Flex Tracks
  - Dynamic Airspace Re-routing
  - User Preferred Trajectories
- RNAV approaches instead of “dive & drive”
Dynamic Aircraft Route Planning (DARP)

- Evolutionary implementation
- Pilots can change route based on real winds (instead of forecasted winds used at time of filing a flight plan).
  - Trials started 1996 in South Pacific
- Equipment Requirements
  - FANS
- Cost Benefit
  - Approx 10,000 USD savings per flight on a typical LAX-SYD
Our common goal:
A harmonized set of global standards that will make the safest form of transport...even safer
THANK YOU
to represent, lead and serve the airline industry