

Position on Separation Assistance System (ASAS)

Nadi, Fiji

ICAO / APANPIRG ADS-B Task Force Meeting

Michel Procoudine Gorsky (Thales)

26 October 2005

AT Alliance - Boeing Cooperation

- Air Traffic Alliance (a grouping of EADS, Airbus, Thales) and Boeing have agreed to cooperate in a number of areas of Air Traffic Management - particularly related to interoperability in support of international standardisation.
- This cooperation involves exploring common views on key issues affecting the evolution and viability of aviation operations.
- The AT Alliance and Boeing will support key initiatives and programs which will improve aviation safety, operational efficiency and global interoperability.
 - Example of concrete cooperation : Tailored arrivals
- Within this framework, we have established the following working groups:
 - RNP, GLS, FOSA, 4D trajectory, Communication, ASAS
- We have developed a common position on ASAS

We plan to support and work within the aviation industry to promote the timely planning and implementation of associated operational applications

ASAS Activities

- **Development of common position**
 - Including roadmap
- **Industry activities**
 - ASAS Requirements Focus Group (RFG)
 - APANPIRG ADS-B Task Force
 - ASAS Thematic Network
- **Response to issues arising**

ASAS – the current situation

- Requirements and design standards development continues to progress
 - Many standardization groups but coordination/consistency improved
 - Some in second or third iterations
- ADS-B-out equipage implemented in the wake of European Mode S mandates
 - Airbus and Boeing aircraft have initial ADS-B out capability
 - Basic on Airbus aircraft
 - Provisions basic, equipment buyer-furnished on Boeing aircraft
 - Provided on a non interference basis
 - Airbus and Boeing aircraft can support ground surveillance functions once standards and certification basis are established
- Ground system capabilities expanding to include use of ADS-B data
- Implementation of ground surveillance applications is beginning to progress
- But current implementation plans are limited; the future is not yet clear

Common Position Elements

We think that.....

- **ASAS shows great promise for use in an evolved ATM system**
- **The transition path needs to be planned and clarified**
 - **We have developed a roadmap**
- **Mode S currently best solution for global interoperability**
- **Development of standards and procedures need support from operational personnel (controllers, pilots)**
- **The industry should seek ways to utilize existing equipage to achieve operational benefit**
- **Common guidelines should lead to global certification standards**
- **Individual operators' business cases for ASAS need to be examined and incentives developed**
- **All mandates should be considered on their own merits**
- **Integrated flight deck solutions preferred**

Elements of roadmap: ADS-B-out

- **Included in new aircraft equipage**
- **Retrofit solutions available**
- **Ground surveillance applications are being adopted**

Considerations:

- **Current systems need further certification**

Elements of roadmap : ATSAW

General

- **Technical/operational prerequisite to more advanced ASAS applications (e.g. Sequencing & Merging)**
- **Reduces the risk by gaining experience**
- **Early benefits possible from ITP**

Considerations:

- **Business case for ATSAW alone**
 - **How can incentives be provided?**
- **Dependent on ADS-B-out equipage levels**

Elements of roadmap : ATSAW

In-Trail Procedures (ATSA-ITP)

- **Crew uses traffic display to assess target range and closure rate**
- **Potential benefits : fuel savings, make up for delays, turbulence avoidance, capacity increase**

Considerations:

- **CPDLC could be an enabler**
- **Effect on ITP business case of changes to oceanic environments (e.g. 30/30 sep'n)**

Elements of roadmap : ATSAW

Enhanced Visual Separation on Approach (ATSA-VSA)

- **First benefits of pure Situational Awareness -- extend use of visual procedures in marginal conditions**

Considerations:

- **Benefits increase with equipment deployment**
 - **Fleets at dominated hubs could benefit independent of other operator equipage**
- **Provides experience for future steps :**
 - **CEFR, where visual contact is lost, perhaps briefly**
 - **Ultimate step might be to apply procedure in all conditions, using system for separation**

Elements of roadmap : ATSAW

Traffic display at airports (ATSA-SURF)

- **Runway occupancy awareness**
 - **Important safety benefits**
- **Taxiway situation awareness**
 - **Limited efficiency benefits**
- **Enables A-SMGCS**

Considerations:

- **Unequipped aircraft/vehicles**
- **Positional accuracy and continuity**

After ATSAW

Sequencing & Merging

- **Promising benefits for ATS and operators**
 - **Better regularity of traffic flows**
 - **Eventually use less frequencies**

Considerations:

- **Procedures/airspace redesign?**
- **Compatibility with other concepts (4-D, CDA, RNP/RNAV, etc.)**
- **Need to win trust in RNAV procedures**
- **Level of delegation needed to obtain full benefits unclear**

After ATSAW

Crossing & Passing

- **Benefits not yet fully examined**
- **Relation with 4-D concepts to be assessed**

Considerations:

- **Acceptability to controllers and possibly pilots is in question**
- **Concept/applicability not yet mature**
- **May be better to develop part of application**

Ground applications after NRA

RAD Using ADS-B in addition to radar

- **Potential benefits in continental airspace**

ADD Other uses for ADS-B data

- **Benefits not yet examined**

Considerations:

- **Operational requirements still TBD**
- **System requirements will follow**
- **Need to understand relationship between ADS-B and Mode S Enhanced Surveillance**

Ground applications after NRA

Precision Runway Monitoring

- **Support CSPA**
- **Much cheaper alternative to specialist PRM radars**

Considerations:

- **May compete with multilateration**
- **Not in current RFG TOR**
- **But requirements well established for radar**

Notional roadmap

-----→ Time

Airborne applications

ATSA – ITP
.....ATSA – VSA.....CEFR (visual lost)
ATSA – SURF Runway Occupancy Alerts
.....S&M
C&P

Ground applications

NRA
RAD
ADD (simple) ADD (complex)
PRM

Need high percentage of aircraft
with ADS-B Out equipage

Do not need high percentage of
aircraft with ADS-B Out equipage

Conclusions

- **Air Traffic Alliance and Boeing share a common view on most aspects of ADS-B:**
 - **Benefits, issues, roadmap....**
- **Airborne use of ADS-B will depend on:**
 - **Integration into ATM system (including ground)**
 - **Availability of operational benefits**
- **Internationally harmonized standards are essential to global interoperability**