European Research Centres
Position and Contribution
in European R&D for SESAR

1st CEAS Conference, Berlin

Challenges

ATM Network inefficiencies, estimated to be
- ~€ 2 Billion for cost effectiveness
  - € 1.4 Billion for en-route fragmentation
  - € 0.6 Billion for associated low productivity
- ~€ 1.4 Billion associated with flight inefficiencies
- ~€ 1 Billion associated with ground delays

Ambitious objectives for the European ATM Infrastructure
- Triple capacity
- Reduce by 50% ATM costs
- Increase safety by a factor of 10
- 10% reduction of environmental impact per flight

Addressed through SESAR - consistent with ACARE-SRA
Teaming up of Research Centres and ANSP R&D Dep.

Contribution in *SESAR Definition Phase* as associated partner; contracted work share (100 person months for all members of RCT; total project 3600 PM)

Additional contribution on a voluntary basis provided by few research centres

Representing the bridge between short- / mid term improvements and the long term perspective
SESAR – The Definition Phase

AT-One
the ATM Research Alliance

**Final Draft**

**D3:**
- The selection of a viable solution.....
- The concept of Operations

**Action Plan**
- Build the ATM Master Plan

**Go!**
- Define organisation & work-programme 2008-13

**D1:**
- A shared view of current situation
- Agreement on blocking points and way ahead

**D2:**
- ATM Performance Partnership
- Performance requirements

24 months
D2: Main Conclusions

- A performance-based approach for the future ATM System
- By 2020: prepare ATM network to handle up to three times more traffic than today, for 50% less ATM costs per flight and gradually improved safety level
- ATM will deliver to minimize the effect on environment
- Identified short-term improvements with potential for operational savings by increasing capacity
- More efficient use of existing airspace and airport resources through available procedures and techniques.
- The SESAR Joint Undertaking (JU) is an important move forward development phase of SESAR.
Today’s concept not adequately geared to maintaining schedules of commercial airspace users
→ “first come, first served” to “deliver-on-time”

Adaptability of current System is limited
→ interoperability, SWIM-features needed

To break through the “capacity barrier”, a “paradigm shift” in the current concept of operations is needed
→ increased use of automation anticipated

D3 New Approach: Business Trajectory
→ user preferred trajectories based on air-ground integration, use of supportive tools and better NAV-performance

D3 Stakeholder Forum in Berlin, 2007-10-17!
Phase 2: Development

Content:
Development of new systems and standards for an ATM system
- all Stakeholder involved
- all R&D efforts coordinated and concentrated
- achieve a modernized European ATM system

Organization:
SESAR Joint Undertaking (SJU)
- Public Private Partnership
- One Management for R&D
- Funding members: European Commission & Eurocontrol
- SJU Administrative Board
  (chaired by EC, establishing guidelines for Executive Director)
- Budget 2,1 B€ (EC (FP7&TEN), ECTL, Industry; 700M € each)
- Call for expressions of interest open until 2007-09-15
SESAR Joint Undertaking - Single management entity

Consistency and cost effectiveness
Performance-oriented management
Aircraft operators participation in decision-making
No ATM R&D will be funded outside of SESAR
ASDA is the Association for the Scientific Development of ATM in Europe representing independent European organizations active in Scientific Research & Development in ATM

- Main scope is to actively identify and define long term R&D goals on a European level
- Promote science and research in the field of Air Traffic and to organize and support R&D consultation processes related to R&D with ATM stakeholders.
- Representing and promoting the interests and aims of independent R&D organizations in international ATM R&D programs and/or organizations;
- Participation in research programs and projects in order to pursue the above mentioned objectives

07/07/02: The EC has formally appointed ASDA Board Member as ASDA’s representative for the scientific Community in the SESAR JU Administrative Board
Experience

competence and leadership capabilities in many European and National research projects (i.e. EC: EMMA, D: LUFO, etc)

Independency

neutral position gives AT-One the opportunity to get acceptance by all stakeholders and the states

Long term perspective

research centres like DLR have the ability to take a look ahead in time. They can develop highly advanced tools for ATM. I.e.: “Virtual Tower” (end of 90th), Planning systems for controllers (mid of 80th, known as AMAN)

Facilities

a great variety of simulation models (RTS/HiL, FTS) and a fleet of research aircraft, including an Airbus A320 and the skill to use these for validation
Areas of interest

- Highly automated ATC, new roles and responsibilities for controller, pilot and UAV remote operator
- Network centered information and decision management
- Air-Ground delegation: self separation, autonomous flights, UAS - sense and avoid
- Airspace and Airport Cluster design and operations
- UASs integration in civil used airspace
- ...
Research Centre – Validation Capabilities

- **Super ATM-Simulator**
  AT-One improves its integrated air-ground simulation capabilities through closer linked networks of simulation modules, scalable to the validation demand.

- **Airport Control Centre** (i.e.)
  For the evaluation of TAM, internal project FAMOUS (Future Airport Management Operation Utility System) is addressing the implementation, test and validation of a complete Airport Operation Centre.
Summary & Conclusion

- SESAR JU will manage the ATM Master Plan developments and implementations
- Almost no ATM research founding outside of SESAR
- Research Centres and Universities can contribute to highly applied and blue sky research in European ATM
- Voice of Researchers should be taken into account (as independent mediator)
- Research is the key for upcoming challenges
Thank you for your Attention
AT-One
The ATM Research Alliance
Centre of Excellence for ATM
Independent
Innovative
Customer oriented
Complete Network of Research Facilities
Facts & Figures

- Strategic Alliance of the DLR Institute of Flight Guidance and the NLR Air Transport Division
- Shareholders: 50% DLR, 50% NLR
- Locations: Braunschweig, Amsterdam & Brussels
- Total employees: ~ 260
- Yearly Turnover: ~ 35 M€
- Background: additional 1400 employees in Air Transport Research

The largest ATM research organisation in the world
AT-One provides ATM research & development, products and consultancy services to customers, in the areas of

- Arrival, ground, departure traffic management
- Airspace and en-route traffic management
- Integrated airport processes
- Validation
- Air-ground integration
- Air Transport Safety & Security
- Environment and Policy Support
- Human Factors & Training.

http://www.at-one.aero
European Commission: „Research did not deliver!“ due to the fact, that „...global failure of aviation community introducing technological changes in ATM business…”

Solution is proclaimed by ACARE SRA-2 (i.e. Research infrastructure):
„...Industry, Research Establishments and Academia should establish a cross stakeholder group to define Europe’s research infrastructure requirements and preservation based on those laid down in the SRA…”