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"Towards a Global Vision on Aviation Safety and Security"

ICAS Workshop
Mykonos, Greece – 3 October 2005

Summary Report
March 2006

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1. Introduction and Summary

The background for the workshop is provided in the invitation letter (Apeendix A)

The one day workshop on the Global Vision on Aviation Safety and Security was the second in a series, organized by the ICAS Programme Committee. It provided an overview of the Aviation Safety and Security activities in the USA, Europe and Japan. These activities are all focused on reducing accident rates and hazards of on-board hostile actions in the environment of increasing air traffic and the presence of terrorist activities.

The workshop provided the opportunity to international experts in the field of Aviation Safety and Security to exchange views and to identify further areas of potential cooperation. This report will be presented on the ICAS website (www.icas.org) for world wide access. Copies of the shown Microsoft PowerPoint sheets can be found on this website under “Past Congresses and Special Events”.

WORKSHOP AGENDA

08.15 Introduction (Jerry Hefner, president of ICAS)

08.30 – 12.30 Morning session on Aviation Safety:
Moderator: Ron Bengelink
Rapporteur: Attilio Galasso

08.30 Joint Safety Strategy Initiative (JSSI) (André Auer, JAA)
09.00 Joint Planning and Development Office (JPDO)
(Jerry Newsom, NASA)
09.30 Aviation Safety Monitoring in Europe (Fred Abbink, NLR)
10.00 Coffee break
10.30 EU/Eurocontrol - Single European Sky Implementation Plan (SESAME)
(Jan van Doorn, Eurocontrol)
11.00 Flight Safety Research in Japan (Yoshikazu Miyazawa, JAXA)
11.30 Discussion
12.00 Hellenic Aerospace Engineering Society (HAES) Issues for Discussion and Helios Airways Accident near Athens Discussion (Akis Tsitinidis)

12.30 – 13.30 LUNCH

13.30 – 16.30 Afternoon session on Aviation Security:
Moderator: John Green
Rapporteur: Akis Tsitinidis

13.30 Research for a Secure Europe (Ernst van Hoek, WEAG)
14.00 EU/Eurocontrol Aviation Security Research Programme
(Fred Abbink, NLR)
14.30 Coffee break
15.00 Security for Aircraft in the Future European Environment (SAFEE Project)
(Daniel Gaultier, Sagem)
15.30 FAA/NASA Aviation Security Programme (Jerry Newsom, NASA)
16.00 Discussion

16.30 – 17.00 Summing up (Fred Abbink)

Workshop
"Towards a Global Vision on Aviation Safety and Security"
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Summary Report
Morning Session

Prepared by
Attilio Galasso
SICAMB SpA

AGENDA MORNING SESSION

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12.00 Hellenic Aerospace Engineering Society (HAES) Issues for Discussion and Accident near Athens Discussion (Akis Tsitinidis)

1. Introduction

Aviation Safety Programs are active in many countries. The USA, Europe and Japan have launched, and are leading several programs, aimed to develop advanced and affordable technologies to improve "Air System" Safety. The goal of all the initiatives is the reduction of the fatal aircraft accident rate.

In the USA the goal is the reduction of the accident rate by 80% in 25 years. A similar program has been launched by the JAA, to reduce the number of accident and fatalities irrespective of traffic growth.

In Europe the major goals of EU Vision 2020 are:

- Reduce accident rate by 50% (80%) in the short (long) term;
- Reach 100% capability to avoid or recover from human error;
- Mitigate results of survivable accidents;
- Reduce to zero hazards of on board hostile actions (in-flight);

while airspace and airport capacity in all weather conditions are expected to increase 3 times.

Three main areas are being investigated, Accident Prevention, Accident Mitigation, Aviation System Monitoring.

The papers in this Workshop **"Towards a Global Vision on Aviation Safety and Security"** are presented by high level representatives of those primary organizations in Europe, Japan, and the United States dealing with Aviation Safety. The papers provide an overview of the worldwide Aviation Safety initiatives, programs and results together with opportunities for cooperation.

2. Joint Safety Strategy Initiative (JSSI) (André Auer, JAA)

The European Joint Aviation Authorities (JAA) is an associated body of the European Civil Aviation Conference (ECAC), representing the civil aviation regulatory authorities of a number of European States, who have agreed to co-operate in developing and implementing common safety regulatory standards and procedures.

Membership is open to all members of the European Civil Aviation Conference (ECAC). There are 39 member countries in the JAA.

The JAA aims at continuous improvement of the safety system, leading to further reduction of the annual number of accidents and fatalities irrespective of the growth of air traffic. The JAA Vision is to have a consistent level of safety in the European aviation system that is among the highest in the world. This shall be reached by teaming up with industry to develop a common strategy and work plan for the development and implementation of safety recommendations.

The goal is to reduce the annual number of accidents and fatalities in each JAA member state and its operators irrespective of the growth in air traffic.

The framework of the JAA Safety Strategy Initiative (JSSI) includes an Organization (Steering Group) with a defined approval process, vision, mission, goal and some identified investigation areas.

The JSSI was launched in 1998. It is a safety improvement program supporting the JAA in meeting its overall objective to continually improve safety in Europe, in particular, and worldwide, in general. The initiative is limited to Large Commercial Transport Airplanes (Maximum Take-off Weight -MTOW >5700 Kg) and has a structured approach complementary to the FAA. Areas of concern are identified following two different approaches that are complementary to each other: a historic/reactive approach, whereby accidents/incidents are analysed and a prognostic/proactive approach whereby future hazards are revealed.

Following the historic approach (Commercial Aviation Safety Team - CAST leading) the Focus Areas include 8 accidents/incidents types: Controlled Flight into Terrain, Approach & Landing, Loss of Control, Design-Related, Weather, Occupant Safety & Survivability, Runway Safety, and Turbulence Occurrence Data Analysis. Turbulence Occurrence Data Analysis specifications are developed for users of the European Coordination Centre for Aviation Incident System (ECCAIRS).

Following the prognostic approach, the JSSI is leading the research on Flight Deck Automation and new concepts for Airspace Management.

The JSSI Steering Group closely cooperates with the Commercial Aviation Safety Team (CAST) that runs a similar program for the USA. A future European safety strategy program under European Aviation Safety Agency (EASA) leadership is being prepared in close cooperation with EASA.

The JSSI program is run by a Steering Group (StG) that is chaired by the JAA Chief Executive. Its membership includes representatives of authorities, industry and interested parties. Working Groups execute the work resulting from its decisions. Several working groups have been established so far and some are currently active; they are called "Action Plan Teams".

All Action Plans are based on those from CAST adapted to European needs/context such as Controlled Flight Into Terrain (CFIT), Turbulence, Weather, Runway safety, Occupant safety & survivability.

Deliverables of the working groups have to be approved successively by the JSSI Steering Group and the JAA Committee before they may be released to the national authorities of JAA member states for implementation.

In the future European Aviation Safety Agency (EASA**)** (27 Member States) will take over responsibility for Operations, Licensing and Safety Assessment of Foreign Aircraft (SAFA) Programme. Central JAA (39 Member States) will close by January 1, 2007, but JAA will continue as JAA-T (Transition) consisting of Liaison Office, Cologne/Germany and a Training Office, The Netherlands. The JAA Liaison Office will close at the end of 2010.
Financing will be through contributions of the EU Member States.

Also in the future, EASA will lead Strategic Safety Initiatives (SSI) in Europe, while central JAA will support transition.
The key elements for EASA Strategic Safety Initiative (ESSI) will make best use of JSSI experience, including all key players in commercial aviation, and will continue the prognostic approach.

3. Joint Planning and Development Office (JPDO) (Jerry Newsom, NASA)

Since traffic volume is expected to increase by a factor of 3 in the next 25 years, and the current Air Traffic Control system is approaching gridlock, transformation of the current US National Airspace is required to meet this growing demand. The US Public Law 108-76 establishes Next Generation Air Transportation System Joint Planning and Development Office (JPDO) with the main responsibilities to coordinate goals, priorities, and research activities within US Federal Government and across US aviation industry and facilitate technology transfer from research to operational and private sector organizations. The JPDO vision is for a transformed air transportation system that provides services tailored to individual customer needs allowing all communities to participate in the global economy, and seamlessly integrates civil and military operations.
The JPDO Strategies include:

- Develop Airport Infrastructure to Meet Future Demand – Federal Aviation Administration (**FAA)**
- Establish an Effective Security System without Limiting Mobility or Civil Liberties – Department of Homeland Security (**DHS)**
- Establish an Agile Air Traffic System - **NASA**
- Establish User-Specific Situational Awareness – Department of Defense (**DoD)**
- Establish a Comprehensive, Proactive Safety Management Approach - **FAA**
- Develop Environmental Protection that allows Sustained Aviation Growth - **FAA**
- Develop a System-wide Capacity to Reduce Weather Impacts – Department of Commerce (**DOC)**
- Harmonize Equipage and Operations Globally – **FAA**

The Next Generation Air Transportation System (**NGATS**) for the year 2025 will have several key capabilities.

- Layered, Adaptive Security which shall enable movement of people/goods expeditiously from “curb-to-curb”, while ensuring protection from foreign & domestic threats.
- Weather Assimilated into Decisions by fusing global weather observations and forecasts into a single database, dynamically updated as needed and identifying hazardous weather real-time.
- Aircraft Trajectory-Based Operations with 4D trajectories (including taxi and roll-out) as a basis for planning and execution. It shall include environmental performance throughout all phases of aircraft operations. In addition, the airspace configuration will be driven by: DoD/DHS requirements, domestic & international user needs, requirements for special-use airspace, safety, environment, overall efficiency.
- Equivalent Visual Operations in an aircraft performing *"equivalent visual"* operations in non-visual conditions (achieve “Visual Flight Rules (VFR) capacity” under these conditions).
- Super Density Operations (reduced arrival/departure spacing) through maximized, environmentally acceptable runway capacity, reduced Runway Occupancy Time, simultaneous operations on single runway.
- Shared Situation Awareness” with real-time free-flow of info from private, commercial and government sources, integrated internationally.

4. Aviation Safety Monitoring in Europe (Fred Abbink, NLR)

The European goal for the year 2020 for aviation safety is a 5 fold reduction in accident rate and for environment, a 50% reduction in CO2 per Passenger-Km and a 50% reduction of Perceived Noise, (compared with the year 2000). During this same time, the European Air Transport System is expected to have a 3 fold increase in airspace and airport capacity in all-weather conditions.

The safety performance has improved significantly over the last decades. The accident rate has been reduced by a factor 50 in the last 45 years of flight operations. In the recent years however, only slow progress has been made. The primary causes of accidents are Human Factor (Flight Crew), Airplane, Weather, Maintenance, Air Traffic Control (ATC). The current accident rate in the western world is already very low (0.48 fatal accidents per million flights). To accommodate the anticipated growth in air transport activity, a significant effort is required to reduce this number further. Knowledge of the accidents and incident root causes is needed to identify actions. Safety monitoring is a tool that can help with this effort.

Aviation Safety is monitored by several bodies, like, Airlines, Accident Investigation Agencies, States, Airports, the FAA and the European Aviation Safety Agency (EASA).

The airlines Accident Prevention & Flight Safety Programme have several objectives like:

- To maintain risk awareness, evaluation, and promulgation of relevant information relating to incidents and accidents.
- Collation of accidents/incidents that occurred with the airline.
- Pro-active use of digital flight data from routine operations to improve aviation safety.

While the accident investigation agencies shall have to determine the causes of air accidents and serious incidents and make safety recommendations intended to prevent recurrence, EASA has the regulatory and executive tasks in the field of aviation safety in the EU. Safety analysis & research is part of this organisation (This task is under development).
The Accident Investigation Agencies report their findings to all parties concerned.

Airlines, airports and air service navigation providers give feedback on their safety findings to their organization. These organizations share their findings with other organizations in the aviation domain. This process is not always arranged in a formal way.

Safety Management Systems (SMSs) are becoming an important element in the aviation community. Such an SMS is a systematic, comprehensive and proactive process for managing safety risks. It integrates operations and technical systems with financial and human resource management to achieve safe operations. SMS looks at the enterprise as a whole.

SMSs are currently implemented at airlines, airports and air service providers in Europe and the pressure to deliver a safe air transport system is becoming stronger each year. The recent accidents and the call for a blacklist of unsafe airlines illustrate this. Monitoring the safety of the total aviation system is becoming increasingly important.

In the future, the role of EASA in monitoring aviation safety in Europe will become more important. It could act as the central point for safety monitoring in Europe to form a single European Accident Investigation Agency.

5. EU/Eurocontrol - Single European Sky Implementation Plan (SESAME) (Jan van Doorn, Eurocontrol)

Aviation is in full expansion. In fact, traffic demand is up by 5% per year while some Eastern European Countries have increases of greater than 20% per year.

The Single European Sky (SES) is an initiative to reform the architecture of European air traffic control to meet future capacity and safety needs. This initiative was launched in 1999. A high level group worked through the year 2000 with the objective to reduce fragmentation between ECAC States, foster the introduction of new technology and explore synergy between EU and Eurocontrol. The proposal for the SES was formulated in 2001.

In March 2004 the SES initiative was adopted by the EU Parliament and later a Memorandum of Agreement with Eurocontrol was signed to benefit from the Eurocontrol expertise.
Eurocontrol contributions are expected in areas like the flexible use of airspace, airspace design, functional airspace blocks charging schemes, and interoperability.

The EU Commission is in charge of implementation, supported by the "Single Sky Committee" and the Industry Consultation Body.

Coordinated analyses & initiatives from Industry, EU Commission and Eurocontrol will avoid fragmentation and accelerate European Air Traffic Management (ATM) evolution. A single Common Master Plan for Research and Implementation shall be developed by ATM industry, operators & users, civil & military, together in defining, committing to, and carrying out the plan.

Financing, for the initial phase, will be 60 million Euro in 2 years (100% funding for industry consortium), coming from European Commission (30 Million Euro) and Eurocontrol (30 Million Euro).

The success of the SES initiative requires a coordinated collaborative effort, guided by a single shared vision and the creation of a common framework for research and technological development responding to issues of public interest including noise & emission reduction, reduced travel delays and increased security.

The Eurocontrol Air Traffic Management 2000+ Strategy and the EU Vision 2020 are aligned with the Advisory Council for Aeronautics Research in Europe (ACARE**)** Strategic Research Agenda (SRA).

Launched at the Paris Airshow in June 2001, the ACARE comprises about 30 members, including representation from the Member States, the Commission and stakeholders, including manufacturing industry, airlines, airports, service providers, regulators, the research establishments and academia. ACARE activities include the development, approval and updating of the SRA .The Strategic Research Agenda is the plan for materialising the EU Vision 2020 and the goals it identifies.

Strategic Research Agenda 2 (SRA 2) is a holistic and integrated view of the European Air Transport System. It represents an extreme challenge for leading edge research to meet societal needs while seeking global leadership.

ATM is a main pillar in SRA 2 , exploiting Network wide managed system; Integrated Air Ground approach; System Wide Information Management; 4D Trajectory Management and precision navigation; Aircraft Autonomous Operations / Airborne Separation Assistance System; Human System Automation Support – decision support tools; Aircraft Communication and Navigation capability; Integrated Airport and ATM processes with environment considerations. ATM research will have a strong influence in safety improvement in Europe.

6. Flight Safety Research in Japan (Yoshikazu Miyazawa, JAXA)

No fatal accident in Japanese scheduled flight has been recorded for 20 years. The accident rate was 1 fatal accident/ 11 million flights = 0.09 per million flights (1985-2003). Accidents due to turbulence were 21/42 (= 50 %).The number of flights has increased nearly twice in 20 years. Airline operators have made efforts to prevent cabin injuries due to turbulence through enforcing the use of seatbelts while seated, flight attendant procedures, handhold installation and sharing turbulence information with other aircraft.

One of JAXA's challenges is the development of an airborne turbulence warning system for jet transports which can detect Clear Air Turbulence (**CAT**) up to 5 NM (9.2km) at cruise altitude (30,000–40,000ft).Key challenges of an onboard CAT warning system are eye safety, compact and low power, and reliability. The 1.5 μm all-fiber pulsed Coherent Doppler Lidar (CDL) system should comply with the above requirements as all the optical components are fiber-based and they are connected by optical fiber. A 3 NM model (100W) is under development. Flight evaluation is expected in 2006.

JAXA's researchers study CAT warning systems from Lidar data including:
- Detection method and warning algorithm
- Collaboration with computational fluid dynamics researchers and meteorologist
Turbulence prediction will be in their future scope.

The helicopter is a good application for Lidar due to its operation at low velocity and low altitudes - the detection range is short and aerosol density is high.

Recently a series of incidents has occurred in Japan's major airlines. Also, a railroad accident killing 107 people occurred recently. These events have resulted in the Japanese Civil Aviation Board (CAB) organizing a committee to assess the transportation system safety status considering risk management, system safety information, crew training, and procedures and manuals. This evaluation will be audited by the Japanese government.

JAXA researchers are proposing Cockpit Resource Management (CRM) skill measurement methods to make CRM training more effective as the human model incorporates quantitative evaluation for pilot workload.

JAXA has also constructed a new experimental technology model to evaluate the concept by simulator and flight tests. JAXA further constructed an experimental model of Communication, Navigation and Surveillance (CNS)/ATM concept for small aircraft operation to evaluate it by simulation and flight test, NOCTARN is a new Operational Concept using Three-dimensional Adaptable Route Navigation. The set up consists of ATC station, virtual aircraft simulated on the ground, wind sensor, and real aircraft. All the ground facilities were connected by three types of messages, such as datalink, wind, and scenario. The onboard display consists of four functions of navigation, guidance, traffic awareness and data link communication. A series of flight tests were conducted to investigate feasibility of the proposed operational concept. One helicopter and one airplane were included in the campaign.

Disaster relief operation is another candidate of the application of a Distributed Air Management System. Japan has experienced strong earthquakes, in which disaster relief by air, especially by helicopters, is essential together with data communication network.

Cabin safety is another area where JAXA researchers challenge crash numerical simulation technique establishment for aircraft crashworthiness. The goal is cabin safety improvement to increase survivability in case of accidents. Experimental crash tests have been performed including the ATR 42-300 fixed wing aircraft drop test and the MH2000 helicopter Crash Test.

In conclusion, Japan maintains a good record in aviation safety. To maintain and improve this record, JAXA researchers are studying important areas including turbulence detection and warning system, human factors, CNS/ATM technology and crashworthiness.

7. Hellenic Aerospace Engineering Society (HAES) Issues for Discussion (Akis Tsitinidis)

HAES presented some topics of strong concern related to a relaxation of requirements for the qualification of airworthiness inspectors by the competent authority (i.e. the Hellenic CAA). The concerns may be summarized as follows:

Educational qualification requirements:

- An appropriate Part-66 licence or aeronautical degree or equivalent is only desirable according to the recent P.D. 147 / 2005 in Greece while, according to the EU regulations, the above qualifications are mandatory.
- Moreover, for a Part-66 licence to be considered as equivalent to an aeronautical degree (for the purposes of fulfilling airworthiness inspector requirements), additional education is required.
- The additional educational requirements are not explicitly defined in the relevant regulations and the typical seminars of limited duration are not necessarily adequate to fulfil the additional education requirements.

Airworthiness experience requirements:

- The five year experience requirement in continuing airworthiness of EU (EASA) regulation 2042 / 2003 is interpreted by the recent Presidential Decree 147/2005 merely as five years practical work experience in an aircraft maintenance shop.

HAES is concerned that the airworthiness inspector must have a much wider and higher level educational background on aircraft airworthiness, as well as experience covering all aspects of airworthiness. Specifically, HAES is concerned that there is room left in the recent Greek legislation, whereby the relaxation of academic skills and training requirements in the legislation may not necessarily warranty the adequacy of selected airworthiness inspector personnel and thus may reduce in practice aviation safety standards despite formal compatibility with EASA regulations.

8. Helios Airways Accident near Athens Discussion (Akis Tsitinidis)

HAES with all due caution, pending the formal accident investigation findings and report of this tragic accident, discussed that there were accumulating indications that human factors may have played a very important role in the chain of events that led to the crash of the aircraft (ranging from the condition of the aircraft at take-off, to the reaction of the crew to whatever technical problem may have arisen shortly after take-off, to communication difficulties between involved parties), as well as in the tracking of the aircraft by ATM and the coordination of Search & Rescue operations

9. Discussion

The following key observations are summarized from the responses to the morning's presentations.

It is obvious that all represented agencies see a very similar future, i.e., a roughly three times increase in traffic in the next twenty years and the need to continue to decrease the rate and absolute number of aircraft accidents as this increase occurs. Also, all have similar goals; that is to decrease accidents by approximately 80% through the application of better technology, training, and air traffic management.

It is apparent that the improvements already applied to the latest generation of transport aircraft and to the air traffic management systems in North America, Europe, and Japan are resulting in significant reductions to the accident rate and numbers today. Most accidents today involve earlier generation aircraft in less well covered parts of the world - specifically Africa, South America, and the interior of Asia.

It is apparent that coordination between the agencies represented at this workshop needs to continue to ensure that the approaches to improvement are consistent and are consistently applied over the highly trafficked oceans - both the North Atlantic and the North Pacific - and somewhat later, over the North Pole.

Finally, the current transitions of authority going on in Europe - from the JAA to EASA, and from individual state control of air traffic to Eurocontrol - need to happen smoothly and efficiently not only for the improvement of air traffic safety in Europe, but also to better enable the international coordination of over-ocean air traffic management over the North Atlantic

Workshop
"Towards a Global Vision on Aviation Safety and Security"
Mykonos, Greece - October 3, 2005

Summary Report
Afternoon Session

Prepared by
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Hellenic Aeronautical Engineers Society

AGENDA AFTERNOON SESSION

12.30 – 13.30 LUNCH

13.30 – 16.30 Afternoon session on Aviation Security:

Moderator: John Green

Rapporteur: Triantafillos (Akis) Tsitinidis

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14.30 Coffee break

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16.00 Discussion

16.30 – 17.00 Summing up (Fred Abbink)

1. Introduction

The afternoon session addressed aviation security issues and ongoing development activities in Europe and the U.S. Special focus on aviation security enhanced capabilities was given after the 9/11 terrorist attack in the U.S., emphasizing the cross-border nature of the matter (particularly in Europe) and the need to identify and respond to threats in a technologically highly advanced (hostile) environment.

There were four presentations given in this session, addressing the close relation of security to defense needs and the potential of an enhanced cooperation between civil and military activities (presentation of Ernst van Hoek, ex Western European Armaments Group (WEAG) Chairman), ongoing European security Research and Development (R&D) activities emphasizing ATM security improvements (presentation of Fred Abbink of NLR), the current status of the EU Security of Aircraft in the Future European Environment (SAFEE) project presented by Daniel Gaultier of SAGEM, and the NASA/FAA Aviation Safety and Security program that is currently undergoing revision (presentation by Dr. Jerry Newsom of NASA Langley Research Center).

The need for close coordination between the numerous organizations involved in aviation security was clearly identified at international level, and the usefulness of sharing civil and military developments and information; however, a number of obstacles are present, relating to the classification of military data and the delicacy of security-related activities. The multi-disciplinary nature of the required technology developments was also pointed out, while it was recommended that extreme (rather than standard) situations/scenarios must be addressed in order to develop and validate the tools necessary to remain ahead of potential security threats and to establish the capability to successfully respond to such threats before they become catastrophic.

2. Research for a Secure Europe (Ernst van Hoek, WEAG)

Security research in Europe effectively started in 2003, with a first exchange of ideas between the Group of Personalities (GoP), motivated by European concerns on international terrorism and crime. Until this time, the EU had not been involved in defense or related activities.

The first projects on security were set up in 2004, initially at local and regional levels, focusing on advanced capabilities in information acquisition and processing, protection, post-disaster management and coordinated support. At the same time a coordinated European effort was also starting the Preparatory Action Security Research (PASR) and the European Security Research Programme (ESRP).

It is clear that security research has main commonalities with defense research, while it has attracted high interest and is politically relevant. International cooperation in this area assumes the pre-existence of relevant national activities, and must account for disappearing borders (physical and economical), a reality to which European governments have proven slow to adapt.

However, the transfer of defense Research & Technology (R&T) and international cooperation experience to security Research and Technology (R&T) requires some degree of adaptation, and the European Defense Agency (EDA) could support developments in this direction, in line of course with EU activities. The Defense R&T cooperation experience includes tools of cooperation (MoUs, contracts, networks), and a number of established technologies (Radar, Materials, Information Technology, Protection technologies, Modeling & Simulation methods, Chemical and Biological (CB) technologies, Space-based technologies).

Specific parameters of relevance in the aerospace sector include vulnerability in flight, strong psychological effects, strong high-tech content, and major economic impact. Therefore, any security measures should be complete and all-inclusive as partial solutions have a very limited effect (integrated design for future aircraft). The human factor is particularly important and permanent training and simulation must be provided.

The way to resist international terrorism is to seek efficient cooperation and synergies between projects, establishing efficient links between technologists, industry, policy makers and executive organizations, and maintaining the advance to lawbreakers and catastrophes, keeping always in mind that borders have in many cases lost their meaning and security can be established successfully over regions / continents rather than national states.

3. EU/Eurocontrol Aviation Security Research (Fred Abbink, NLR)

It is evident that international terrorism risks can and do extend over national borders. Therefore, security issues must be treated in an international cooperation context. In Europe, there exist a number of overlapping organizations, including ECAC (with 42 member states), JAA (with 39 member states), EASA (with 28 member states), Eurocontrol (with 35 member states) and Group of Aerodrome Safety Regulators (GASR) (with 21 member states).

The EU Group of Personalities (GoP) report “A Secure Europe in a Better World” outlined the following recommendations on security in Europe:

- Coordinate national, governmental and Community RTD efforts
- Bridge the gap between civil and defense security research
- European Security Research Program (ESRP) of 250 M€ per year
- Implementation of a European Security Research Advisory Board (ESRAB)
- Funding of programs useful for internal security; capability oriented
- Multipurpose aspects of technology (civil / security / defense)
- Specificities of security rules for Intellectual Property Rights (IPR), funding and technology transfer
- New financing instruments for up to 100% funding (if justified)
- Funding for technology research up to demonstrators

Safety and security projects in the EU are supported by the following thematic actions:

- Preparatory Action Security Research (PASR)
- European Security Research Program (ESRP)
- Directorate General-Transport and Energy (DG-TREN): Network for Security of Transport and Energy
- Directorate General Research, Technology and Development (DG-RTD) Aeronautics – Improving aircraft safety and security
- NATO/Eurocontrol ATM Security Coordination Group (NEASCOG) strategy and activities

The goal of PASR (years 2004-2006), an initiative outside the 6th EU RTD Framework Programme with a budget of 65 M€, is to improve situation awareness, optimize security and protection of networked systems, protection against terrorism, enhance crisis management capability, and achieve interoperability and integrated systems for information and communication. Of specific interest to aeronautical security is the EU Project PATIN (Protection of Air Transportation and Infrastructure).

Moreover, the EU Integrated Project (IP) Security of Aircraft in the Future European Environment (SAFEE) aims to ensure a fully secure flight from departure to arrival destination, whatever threats and/or terrorist actions might occur.

The EU Specific Targeted Research Project (STREP) MATISSE aims to reduce the risk of hostile or accidental collision of aircraft in the airport environment.

The NEASCOG strategic objectives focus on civil-military radar data sharing, ATM security systems for crisis management, communications for encryption and transmission of aircraft voice and video information and ATM security training and procedures. Specific Eurocontrol objective is the “Determination of effective mechanisms and procedures to enhance the response of ATM to security threats affecting flights (aircraft and passengers) or the ATM system”.

The European Regional Renegade Information Distribution (ERRIDS) objectives include the distribution of information to all involved organizations in response to unlawful acts, and the support of civil-military authorities in decision making, in coordination with existing national or international systems.

Close coordination between key (aviation) security working groups worldwide is of paramount importance: International Civil Aviation Organization (ICAO) Aviation Security (AVSEC) Panel, ECAC Security Working Group, International Federation of Airline Pilots Associations (IFALPA) Security Committee, Stakeholders and Industrials organizations, International Air Transport Association (IATA), European Security Research Advisory Board (ESRAB), Security Mission Industry Group (SMIG), European Security & Defence Analysis Group (ESDAG), US organizations (Transportation Security Administration (TSA), Department of Homeland Security (DHS), FAA and research establishments.

Strengthening of cooperation between civil and military organizations, consultation with ESRAB, and continuation of PASR/launching of ESRP, with the potential integration of the SAFEE and ERRIDS programs constitute the important next steps in European security environment developments.

4. SAFEE Security of Aircraft in the Future European Environment (Daniel Gaultier, SAGEM)

The ongoing EU Security of Aircraft in the Future European Environment (SAFEE) project scope focuses on security of aircraft in flight (crew & passenger attacks, cargo hold threats, and outside threats). Five main sub-projects are identified regarding on-board threats at present time:

- On-board Threat Detection System (OTDS)
- Threat Assessment and Response Management System (TARMS)
- Flight protection against hostile attempts (FRF/EAS)
- Data processing (DATA)
- Security evaluation

The SAFEE consortium comprises 31 partners from 12 European countries.

The SAFEE sub-project SP1 (OTDS) addresses the detection of threats from persons and dangerous goods and materials through access control to the aircraft (cockpit, cabin and cargo bay), and the detection of suspicious behaviour.

The SAFEE sub-project SP2 (TARMS) addresses threat assessment and response management by assimilating all available information to decision makers, analyzing information using expert knowledge models, analyzing possible courses of action and presenting information and advice to the decision-maker.

The SAFEE sub-project SP3 (FRF/EAS) addresses a proposed Flight Reconfiguration Function (FRF), whereby after the original pilot becomes inoperative, the FRF system takes over the aircraft flight controls. This area involves advanced, long-term research studies.

The objective of SAFEE sub-project SP4 (DATA) is to protect communications and data that are daily used for exploitation of aircraft in a hostile environment, addressing data security aspects in the aircraft.

The SAFEE sub-project SP5 (Security Evaluation) addresses legal and regulatory issues, threat assessment, SAFEE system validation, training to potential end-users, economic analysis and international security improvements, with particular concern on human rights issues and SAFEE's impact on regulatory bodies.

A SAFEE user club is available for organizations dealing with aviation security. Moreover, there is a synergy between SAFEE and ERRIDS (European Regional Renegade Information Dissemination System) addressing aircraft security from the side of the ground terminal.

5. NASA Aviation Safety and Security Program (Jerry R. Newsom, NASA)

The NASA Aviation Safety & Security Program (AVSSP) goal is to decrease the aircraft accident rate and the vulnerability of the air transportation system to threats, and to mitigate the consequences of accidents and hostile acts, by developing the necessary technologies and procedures in cooperation with the FAA, the Transportation Security Administration (TSA) and the U.S. aeronautics industry.

NASA aviation safety projects have included vehicle, system and weather safety technologies, while the current main factors for safety R&D planning involve a focus shift to:

- Revolutionary and Retrofit technologies
- Safety factors associated with the operation in the next generation Air/Ground ATM environment
- Space-based communications, navigation and surveillance
- Integration of appropriate aircraft type mix
- Maintenance of ageing aircraft fleets
- New pilot demographics (less flight experience – more computer experience)
- Accident preventive risk assessment
- Security synergies / conflicting requirements

FAA aviation safety research focuses on the following topics:

- Fire research and safety
- Advanced materials / structural safety
- Atmospheric hazards / digital system safety
- Ageing aircraft
- Aircraft catastrophic failure prevention research
- Aviation safety risk analysis
- Air traffic control / airway facilities human factors
- Aeromedical research
- Weather programs
- Wake turbulence

NASA aviation security research focuses on vulnerability mitigation for aircraft and systems, and the detection of vulnerabilities, with first priority to prevent terrorists from boarding commercial aircraft, second priority to prevent terrorists from overpowering the crew and taking control of the aircraft in case they get on board, and as a last resort (if other interventions are not successful) prevent hijackers from crashing the aircraft on populated areas or strategic targets.

6. Discussion

A main topic in the discussion that followed the presentations related to a consensus regarding the potential and usefulness of cooperation on security matters across the Atlantic, noting however the delicacy of sharing data / technologies which are common to defense programs. It was agreed, though, that a coordinated effort must be made to strengthen the existing cooperation, at least on matters of basic R&D and the sharing of security information and experience.

List of Abbreviations

ACARE	Advisory Council for Aeronautics Research in Europe
ATC	Air Traffic Control
ATM	Air Traffic Management
AVSEC	Aviation Security
AVSSP	Aviation Safety & Security Programme
CAST	Commercial Aviation Safety Team
CAT	Clear Air Turbulence
CB	Chemical & Biological
CDL	Coherent Doppler Lidar
CFIT	Controlled Flight Into Terrain
CNS	Communication, Navigation and Surveillance
CRM	Cockpit Resource Management
DATA	Data processing
DG-RTD	Directorate General – Research, Technology and Development
DG-TREN	Directorate General – Transport and Energy
DOC	US Department of Commerce
DoD	US Department of Defence
DHS	US Department of Homeland Security
EASA	European Aviation Safety Agency
ECAC	European Civil Aviation Conference
ECCAIRS	European Coordination Centre for Aviation Incident System
EDA	European Defense Agency
ERRIDS	European Regional Renegade Information Distribution
ESDAG	European Security & Defense Analysis Group
ESRAB	European Security Research Advisory Board
ESPR	European Security Research Program
FAA	Federal Aviation Administration
FRF/EAS	Flight protection against hostile attempts
GASR	Group of Aerodrome Safety regulators
GoP	Group of Personalities
HAES	Hellenic Aerospace Engineering Society
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFALPA	International Federation of Airline Pilot Associations
IPR	Intellectual Property Rights
JAA	Joint Aviation Authorities
JPDO	Joint Planning and Development Office
JSSI	JAA Safety Strategy Initiative
JPDO	US Joint Planning and Development Office
MTOW	Maximum Take Off Weight
NEASCOG	NATO / Eurocontrol ATM Security Coordination Group
NGATS	Next Generation Air Transportation System
NOCTARN	New Operational Concept using Three-dimensional Adaptable Route Navigation

OTDSS	On-board Threat Detection System
PASR	Preparatory Action Security Research
PATIN	Protection of Air Transportation and Infrastructure
R&T	Research & Technology
SAFA	Safety Assessment of Foreign Aircraft Program
SAFEE	Security of Aircraft in the Future European Environment
SES	Single European Sky
SESAME	Single European Sky Implementation Programme
SMS	Safety Management Systems
SRA	Strategic Research Agenda
Stg	Steering Group
STREP	Specific Targeted Research Project
TSA	Transport Security Administration
TARMS	Threat assessment and response management system
TSA	Transport Security Administration
VFR	Visual Flight Rules
WEAG	Western European Armament Group

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APPENDIX A

Version: 27 April 2005

Personal Invitation
Workshop

"Towards a Global Vision on Aviation Safety and Security"
Mykonos, Greece - October 3, 2005

During the last few years a number of visionary and strategic documents on the future of aeronautics have been developed world-wide. An important aspect of all these documents is the necessary increase of airspace and airport capacity as well as on the increase of aviation safety and security.

The ICAS Programme Committee, comprising over 50 representatives from the world-wide aeronautical community, will hold a planning meeting early October 2005 in Mykonos, Greece for the ICAS 2006 Congress in Hamburg, Germany. Taking advantage of the gathering of this unique group of experienced people, it has been decided to arrange a one-day workshop on the above theme.

The workshop will include overview presentations by invited speakers from Europe and the United States, as well as from other parts of the world including Russia and Japan The speakers will be asked to focus on the vision and developments in their organisation and country relative to enhanced Aviation Safety and Security.

The preliminary draft programme (with tentative and confirmed speakers) for the one-day workshop is:

Morning session on Aviation Safety:
a) Joint Safety Strategy Initiative (JSSI) (André Auer, JAA)
b) Joint Planning and Development Office (JPDO) (Jerry Newsom, NASA)
c) Aviation Safety Monitoring in Europe (Fred Abbink, NLR)
d) EU - Single European Sky Implementation Plan (SESAME) (Jan van Doorn, Eurocontrol)
e) Flight Safety Research in Japan (Yoshikazu Miyazawa, JAXA)
f) Issues for Discussion and Accident near Athens (Akis Tsitinidis, HAES)
Discussion

Afternoon session on Aviation Security:
a) Research for a Secure Europe (Ernst van Hoek, WEAG)
b) EU/Eurocontrol Aviation Security Research Programme (Fred Abbink, NLR)
c) Security for Aircraft in the Future European Environment (SAFEE) (Daniel Gaultier, Sagem)
d) FAA/NASA Aviation Security Programme (Jerry Newsom, NASA)
Discussion

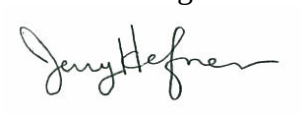
The idea is to have discussions and dialogues involving all participants. This will be achieved through question and answer sessions after each presentation plus thematic panel discussions around key topics including interaction with the audience at the end of each session.

It is our intention and hope that this workshop will generate creative ideas regarding a global vision for these key challenges. We plan to document the main findings and conclusions from this event and will make the documentation publicly available on the ICAS Web-site.

It is our pleasure to invite you to take part in this special event. Please confirm your attendance and willingness to contribute before July 1, 2005 to the ICAS Secretariat at the above address.

The venue for this event will tentatively be Royal Mykonian Hotel, Elia Beach on the island of Mykonos. Mykonos island can be reached by flight from Athens (25 min) or by boat from Pireous (3,5 hours). More information about the venue, accommodation booking and transportation details will be provided later by the ICAS Secretariat.

With best regards



Jerry Hefner
ICAS President

Fred Abbink
Chairman Programme Committee

APPENDIX B

LIST OF PARTICIPANTS – WORKSHOP MYKONOS 3 October, 2005

Name	Affiliation/Country
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Prof. Billy Fredriksson	Saab, Sweden
Anders Gustafsson	ICAS, Sweden
Prof. Ir. Fred Abbink	NLR, Netherlands
Dr. Ing. Wolfgang Schmidt	WS-Consult, Germany
Ronald L. Bengelink	Arizona State Univ., USA
Prof. Giovanni Carlomagno	Univ of Naples, Italy
Dr. Alexander S. Filatyev	TsAGI, Russia
Dr.-Ing. Christian Mari	Teuchos, France
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Andre Auer	JAA, Netherlands
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Ernst van Hoek	WEAG, Netherlands
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