

MINUTES

- What: Workshop
General Aviation and European Transport System – Third Call FP7
- When: **7th to 8th July 2009**
- Where: **Institute of Aviation, Warsaw, Poland**
- Who: **See Attendance List**
- Why: **To create synergy of European GA Stakeholders**

Presentations from the Workshop you can find at:

<http://www.ilot.edu.pl/GeneralAviation/presentations.php>



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Summary

General Aviation in the EU is a diverse and dynamic sector undergoing rapid changes. It involves a wide spectrum of aircraft ranging from gliders to complex business jets, providing high value services such as **aerial works or emergency and personal door-to-door air transportation (by small airplane ranging from 4pax up to 19 pax)**. It constitutes an important part of the EU aeronautical industry.

To address these challenges the European Commission, following broad consultations, adopted on 11 January 2008 its Communication "**An Agenda for Sustainable Future in General and Business Aviation**". The Agenda was accepted by the European Parliament on February 3rd 2009 as a resolution which among other challenges:

- calls on the Commission to reinforce support for aeronautical research, development and innovation, in particular by SMEs that develop and build aircraft for general and business aviation
- Reminds the Commission of the need to carry out, on a systematic basis, segmented impact assessments to provide for differentiation of regulations affecting different categories of undertakings and airspace users, if necessary and in so far as this does not compromise safety;
- Urges the Commission and Member States to implement measures for optimizing the use of existing capacity at major and regional airports by better planning and through the deployment of modern technologies, such as foreseen in the Commission Action Plan for airport capacity, efficiency and safety in Europe ("the Commission's Action Plan");
- Encourages Member States and regional and local authorities to invest in the modernization and establishment of small and medium-sized airports, which are of major importance for general and business aviation;
- Encourages the Member States to invest in specific infrastructure necessary for the operation and stationing of aircraft in the field of general and business aviation;
- Believes that helicopters can be an important short-haul means of connecting between airports and urges the Commission and Member States to include them in capacity-enhancing strategies.

Polish, Romanian, Czech and also other European aeronautical communities appreciate pro-active approach towards enhancing research and development goals, regarding General Aviation (GA), set forth by the European Commission in "An Agenda for Sustainable Future in General and Business Aviation".

The European Commission has announced a new, 3rd Call of the 7th Framework Program for 2010. Many research topics deal with personal small air transport system. Some of these topics are an effect of the project "European Personal Air Transportation System (EPATS)", carried out from 2006 to 2008 and coordinated by the Institute of Aviation in Warsaw. Main goal of this project was to investigate the possibility of future substitution of long distance car trips (especially business trips) with small aircraft, operated in an intelligent personal transport system. Conclusions of this study are presented in the document "EPATS roadmap".

In answer to the EC and EP challenges above mentioned European General Aviation Community decided to prepare a workshop: **“General Aviation and European Air Transport System – Third Call FP 7”**.

The workshop took place on July 7th-8th 2009, in Warsaw, Poland. Main organisers were: Institute of Aviation, Polish National Contact Point with cooperation of VZLU (Czech Republic) and INCAS (Romania). However, nothing of real importance could be done without real response of all European General Aviation Community - European Institutions (European Parliament, European Commission DG RTD, EASA, EGAMA, ACARE, EqIMG, EASN), European GA Industry (Diamond, Piaggio, Evektor, Ivchenko, SMEs etc), also European Research and Academia as well as Project Coordinators of themes related to GA and also private personalities.

One of its main objectives was discussion on future European Air Transport System, based on small aircraft.

During the workshop all European stakeholders had an opportunity:

1. to discuss research priorities from General Aviation – Air Transport System (GA_ATS) and General Aviation perspective, which could also provide a feedback for the future Work Programme documents of FP7
2. to present project ideas for the 3rd Call in Aeronautics in order to elaborate proposals of CSA-SA and L1 type which would incorporate both ideas and potential beneficiaries from all countries interested in GA related research.

During the panel discussions, participants had a chance to present their ideas of 3rd call proposals regarding GA. The workshop created the opportunity to select the most interesting one; therefore potentially increasing "success rate" during future evaluation. Participation in the selected, most promising proposals has also been debated.

The whole process was possible thanks to the participants who have sent a short description of the proposal's idea using attached form for workshop panel discussion.

3. to contribute to a general overview of current situation of GA and overview of research related to GA (SESAR, collaborative research projects such as EPATS, CESAR, SOFIA, PPlane, etc.)
4. to discuss potential future developments based on e.g. feedback from EASA and European Civil Aviation Conference (the study requested by the EC).
5. to introduce also other subjects

The Workshop results were:

- **32 Proposal Ideas – presented and discussed**
- **7 pre-proposals – suggested to take part in submission 3rd Call**

The 7 pre-proposals – to take part in submission 3rd Call - suggested by Workshop attendants are:

- 1) **Roadmap for engaging small aircraft in European ATS (Air Transport System)** – could be EPATS STUDY (Topic AAT.2010.7-12 Assessing and further developing the role of small aircraft in the air transport system)
- 2) **Single Pilot operation as a starting point to GA Avionics** (Topic AAT.210.3.3-3 Avionics – Advanced concepts and technologies to counteract hazards specific to the flight operation of small size aircraft operating in non-scheduled flights)

- 3) **Novel Concepts** - it could be **AEROVAN** but not as aircraft project but as a set of novel technologies oriented for "novel concepts" + safety + low noise + low emission (Topics AAT.2010.6.3-3 Personal air transport systems and AAT.2010.6.2-1 Novel air transport vehicles)
- 4) **The rest of pre-proposals could start in traditional domains as aerodynamic /structures /propulsion/production** but in these domains competition is intense. So good strategy for increasing chance for success could be to combine single idea proposals for exhaustive, comprehensive projects - for example:
 - a) **GA ENGINES** - oriented for low noise & low emission, biofuel, coupled (i.e. piston +electric) areas
 - b) **GA SMART TECHNOLOGIES** - transfer/synergy with advanced aerospace achievements
 - c) **GA HAZARDOUS STATES** - crashworthiness, spin, lightning, thermal shock
 - d) **GA COMFORT** - cabin climate, noise & vibration, pressure, bugs, toxically fire emissions

Workshop attendants have left the decision to combine or work out with separate proposals to the project leaders.

It has been noted that it could be useful for whole European General Aviation Community to keep track of development of the proposals. It has been suggested that Institute of Aviation could list the chosen GA projects, monitor the status of their preparation and make them accessible to our Community. This kind of activity is logical and expected also by The European Commission.

To achieve this aim it is necessary to report all necessary, subsequent developments to the IoA (the name of project, its requested partners, stage of progress and other relevant details). Project Leaders or designated proposal managers, responsible for proposal submission, should prepare these reports and send them once a month to the Institute of Aviation.

In Institute of Aviation the proposal tracking process will be organized by Krzysztof Piwek, (his email address is khp@ilot.edu.pl) to whom the reports should be sent.

110 attendees from 15 countries took part in the workshop

AGENDA

"General Aviation and European Air Transport System - Third Call FP7"

WARSAW, Institute of Aviation (IoA), Meeting room "SOLTYK" on **7-8 July 2009**

First day - 7 July 2009

09:00 Welcome **Witold WIŚNIEWSKI (IoA)**, **Josef KASPAR (VZLU)**, **Catalin NAE (INCAS)**

Session A- Big Picture - General Aviation and European Air Transport System

Chairman: **Krzysztof Jan KURZYDŁOWSKI (Polish rep. to ACARE plenary)**

09:30 European Parliament support for General Aviation (Agenda G&BA, EP Resolution) – **Bogusław LIBERADZKI (Member of European Parliament)**

09:40 Industrial position towards GA R&TD topics – **Tony HENLEY (EqIMG)**

10:00 EGAMA introduction – **Jaroslav RUZICKA (EGAMA)**

10:15 EASA's Activities in Aviation Research and Safety Improvements – **Werner KLEINE-BEEK (EASA)**

10:40 Research Topics open for 3-rd Call FP-7 – **Jose MARTIN HERNANDEZ (DG RTD)**

11:15 Coffee break

Session B – Making the most of past and current EU Collaborative Research

Chairman: **Jose M. MARTIN HERNANDEZ (DG RTD)**

11:30 Introduction to the EPATS project results – **Krzysztof PIWEK (IoA)**

11:45 Introduction to the SOFIA project results – **Juan Alberto HERRERIA GARCIA (ISDEFE)**

12:05 Introduction to the CESAR project results – **Karel PAIGER (VZLU)**

12:20 Introduction to the PPlane project – **Claude le TALLEC (ONERA)**

Session C - Common work on GA related proposals in light of envisaged topics and budget of the 3rd Call in Aeronautics

Organizer: **Andrzej PODSADOWSKI**

12:40 General rules of work

13:00 **Lunch in time session C**

After lunch split up in working sessions (4 separate rooms)

ALFA General Aviation & Air Transport System / GA Research needs.

Strategic approach enhancing research for benefit of GA

moderator: **Adriaan de GRAAFF (Ad Cuenta)**

- i) European Personal Aircraft Network (idea of EPAN - prof. Rohacs),
- ii) GA Vision (EPATS-2, EPATS Vision, etc.)
- iii) research for benefit of GA

BRAVO Environmentally friendly GA.

Any ideas to maximize energy efficiency and minimize environmental impact of GA

moderator: **Zdobysław GORAJ (EASN)**

- i) novel concepts,
- ii) engines, fuels/alternative fuels
- iii) systems,

- iv) noise and vibration
- any other idea

CHARLIE Research to revitalization European GA .

Execution of EP Resolution 3 Feb 2009

moderator: **Catalin NAE (INCAS)**

- i) Novel technologies – transfer/synergy with advanced aerospace achievements,
- ii) Structural safety; Life Cycle Extension; Structural Health Monitoring for GA
- iii) Potential concept of CS 23 PLUS - for ATS based on small a/c
- iv) Technology Evaluator of Small Air Transport Aircraft

DELTA New Air Traffic Management and GA.

moderator: **Tony HENLEY (EqIMG)**

- i) SESAR approach
- ii) single pilot operations
- iii) tower less operation
- iv) operating aircraft by less skilled pilot

16:00 Status of working sessions (Sołtyk room) - **MODERATORS of working sessions (10 minutes each)**

17:00 End of first day sessions

Second day – 8 July 2009

Session C - Common work on GA related proposals in light of envisaged topics and budget of the 3rd Call in Aeronautics – continuation

Organizer: **Andrzej PODSADOWSKI**

09:00 General rules of second day work

09:10 Split up in working sessions (4 separate rooms)

11:00 **Coffee break**

Session D – Cooperation on common proposals – chance for everybody

moderator: **Adriaan de GRAAFF (Ad Cuenta)**

11:15 Final wrap up of results in 4 sessions (conclusions) - **MODERATORS of working sessions (10 minutes each)**

12:00 Elaboration of the short list of proposals against priorities and final decisions regarding “GA proposals”; Achieving of common sense in respect to establishing “small brother of JTI Clean Sky” – such as Revitalization of European General Aviation (i.e: GA Vision 2030, Novel technologies – transfer/synergy with advanced aerospace achievements, Technology Evaluator of Small Air Transport Aircraft)

13:30 **Lunch**

Session E – Next steps

moderator: **Zbigniew WOLEJSZA (IoA)**

14:00 Needs for EGAC (European General Aviation Community) - discussion – **Zbigniew TUREK (NCP)**

14:30 Closing remarks DG RDT – **Jose M. MARTIN HERNANDEZ (DG RTD)**

14:45 Next steps and closing remarks of workshop - **Zbigniew WOLEJSZA (IoA)**

15:00 End of workshop

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FIRST DAY - 7th July 2009 - Tuesday

WELCOME

General Director of Institute of Aviation – Mr. **Witold Wiśniowski**, welcomed all participants of the meeting on behalf of the Institute of Aviation. In a short speech, The Director wished the workshop attendants to come across unconventional and creative ideas.

Mr. **Catalin Nae** (General Manager of INCAS, Romania) saw the workshop as an opportunity to take advantage of small countries' industry capabilities to promote a new transport system based on new generation of aeronautical products.

Mr. **Josef Kaspar** (Managing Director of VZLU, Czech Republic) in his speech reminded that general aviation had been a traditional industry in central Europe and said that future general aviation aircraft should be competitive with USA, Canada and Brazil.

MEETING PROCEEDINGS

SESSION A

Big Picture - General Aviation and European Air Transport System

Session A was chaired by Mr. **Krzysztof Jan Kurzydłowski** (Polish rep. to ACARE Plenary).

Mr. **Krzysztof Jan Kurzydłowski**, welcomed everybody and explained that professor **Bogusław Liberadzki** (Member of European Parliament) cannot be present at the meeting and will be replaced by Mr. **Zbigniew Turek** (National Contact Point, Poland).

First presentation (A01) "European Institutions support for General Aviation (Agenda G&BA, EP Resolution)" was presented by Mr. **Zbigniew Turek** on behalf of prof. **Bogusław Liberadzki**.

Main ideas of presentation:

G&BA is fastest growing segment of civil aviation in Europe.

Four Axes s of dialogue on G&BA are:

- **Proportionate regulation and subsidiarity:**
 - EC needs to ensure that implemented rules are commensurate to complexity of aircraft category,
 - EC is invited to simplify security and safety procedures,
 - EC is suggested to facilitate the exchange of security practices.
- **Airport and airspace capacity:**
 - EP urges to EC and member states to include helicopters in capacity enhancing strategies,
 - Member states and local authorities are encouraged to invest in medium sized airports,
 - Business aviation should be given more access to major airports,
 - SESAR program must fully take into account G&BA.
- **Environmental sustainability:**
 - G&BA generates small percentage of pollution,
 - Further reduction of pollution using new technologies is necessary,
 - Noise issues should be dealt with at national and local levels.
- **Other issues:**
 - EC has to help EU G&BA industry to compete in world market,
 - EC is requested to reinforce support aeronautical R+D activities,
 - Promotion of sport and recreational aviation is essential,

- EC is requested to report to EP by the end of 2009 on progress in dealing with abovementioned issues.

Second presentation (A02) “*Industrial position towards GA R&TD topics* ” was done by Mr. **Tony Henley** (rep. of EqIMG, United Kingdom).

Main ideas of presentation:

Key Challenges:

- Vessel Not under Command
 - This is a maritime term.
 - Lost link procedures are being defined.
 - The solution is in development, but progress is slow.
- Safety
 - Accident rate for business jet is far higher than for airline aircraft.
 - Pilot errors play a major role.
 - Future cockpit systems must be intuitive, contribute to situational awareness
 - Business aviation and ANSP should work to improve pilot cooperation with ATC
- Single pilot operation
 - Other issues:
 - Workload
 - Collision avoidance
 - Flight rules
 - System failures management
 - Weather
 - Severe weather hazards
 - Gust alleviation
 - Visibility
- System integrity
 - Community/regulators needs to clarify requirements on few issues
 - New designs offer potential of lower cost and high integrity.
 - A known regulatory regime is essential.
- Cost and business case
 - Initial EPATS and GA-ATS analysis looks promising, but there are issues to overcome
 - Industry is very interested, but issues need to be addressed urgently
 - R&D support will be very important
- What EqIMG can contribute
 - EqIMG is an open forum for European equipment industry,
 - provides technical interface between equipment industry and EC,
 - there are 26 participants from 11 member states.

Third presentation (A04) “*EASA’s Research Activity for Safety Improvement*” was done by Mr. **Werner Kleine-Beek** (rep. of EASA)

Main ideas of presentation:

EASA has mandate for Research activities:

- Basic regulation 216/2008 Article 26.
- Short term research are defined and financed by the Agency.
- Long term research are financed by other sources like FP

Sources of research proposals:

- Safety analysis/occurrence reporting
- Accident Investigation Reports & Safety Recommendations
- Experts from EASA Directorates
- ESSI / Safety Team (ECAST, EGAST, EHEST)

- European Aviation Research Partnership Group (EARPG)
- others

Research Coordination and Partnership

- Internal Research Committee
- EC DG RTD and DG TREN, ACARE
- European Aviation Research Partnership Group (EASA, ESSI and Safety Teams, NAAs, EC, EUROCONTROL)
- Helicopter Safety Research Management Committee
- EASA/FAA/TCCA research cooperation
- Industry and research institutes

Example projects:

- EASA /2007/OP 18: Investigation of technical feasibility and safety benefits of a light aeroplane operating FDM system.
- EASA/2008/OP 3: Safety aspects of Light Aircraft Resistance Concept.
- EASA/2008/OP 34: SIoBIA – Safety Implication of Biofuels in Aviation

Discussion:

Mr. de Graaff (Ad Cuenta, Netherland) said that he hoped, that the conference might have resulted in not only defining projects, but also defining roadmap for GA technology development, and asked Mr. **Kleine-Beek** if EASA would participate. Mr. **Kleine-Beek** answered that EASA was interested in projects on safety issues, however a direct participation as partner is not possible due to EU finance regulations and potential conflict of interest. Mr. **Ralf Endress** (Diamond Aircraft, Austria) asked if EASA could propose a research on operational kind of regulations to improve safety. Mr. **Kleine-Beek** said that many accidents have the same cause and are relied to manufacturers. He said there was a great potential for improvement of safety and technology in GA and business aviation, and they intended to encourage for instance in the spin resistance concept manufacturers to come up with such designs. Mr. **Henley** asked how EASA would distinguish small air transport aircraft from the rest of GA in terms of aerial work.

Mr. **Kleine-Beek** said that there was a research investigating CS 23 or CS 23 and CS 25 to find what was missing in the certification specification, though he thought that there was a need for an additional CS for this kind of aircraft. An additional research might be needed to justify why such requirements are needed and how these aircraft contributed to the safety.

Fourth presentation (A05) "Aeronautics and Air Transport Research 3rd Call for Proposals - 2010" was done by Mr. **José Martín Hernández** (DG RTD of European Commission).

Main ideas of presentation:

3rd call budget:

- 108 million Euro total.
 - 101 million Euro Main Call
 - 98 million Euro – L1 and CSA - coordinating
 - 3 million Euro CSA – supporting
 - 4 million Euro Coordinated call Russia
 - 3 million Euro Coordinated call China
- Max funding per L1 project: 5 million Euro

Timeline:

Publication: 30 July 2009
Deadline: March 2010
Proposal evaluation: March 2010
First contracts: ca. July 2010

Scope of programme:

- Includes:
*Technologies, services and operations of all components of the **air transport system** from airport kerbside to airport kerbside (i.e. aircraft, airport and air traffic management)*

- Excludes:
Non-travel aspects, ticketing and ground vehicles
- Small aircraft research might be funded provided it deals with air transport

Activities in FP:

Opened:

- The greening of air transport
- Improving cost efficiency
- Pioneering the air transport of the future

Excludes:

- Increasing time efficiency
- Ensuring customer satisfaction and safety

Closed:

- Protection of Aircraft and Passengers

Special interest:

- Cabin noise
- „AAT 2010.3.3-3 Avionics” Avionics for small GA aircraft; Single Pilot Operation; Non skilled pilots

Support Actions:

Studies funding ranges between 201 and 511 kEuro funded up to 100%

Important topics on the slide:

- *Improving passenger choice with the incorporation of new vehicles*
- **AAT.2010.7-12 Assessing and further developing the role of small aircraft in the ATS**
(The topic has been created to establish Roadmaps of further development of air transport)

Coordinated Calls:

Novelty in the programme, the Chinese and Russian governments must fund their own money, the money in the calls from EC is only for European partners. Both sides have interest to work together on some problems.

Final thoughts:

As the overall budget is limited it is recommended to concentrate on proposal quality instead of number of proposals.

Next call will include Level 2 projects.

Discussion:

Mr. **Turek** (National Contact Point, Poland) stressed out importance of quality of proposals and international cooperation.

Mr. **Oosten** (TU Delft, Netherlands) asked if there would be any programs concerning UAVs.

Mr. **José Martín Hernández** answered that it is possible to consider a proposal concerning UAVs as long as it has anything to do with transport issues, otherwise it will be deemed ineligible and it was the same for GA. Mr. **Oosten** asked if it has to be linked commercial transport. Mr. **José Martín Hernández** answered it had to have an application, connotation or whatever to commercial air transport.

Mr. **Le Tallec** (ONERA, France) asked if Mr. **José Martín Hernández** meant passenger, cargo or data transport and asked to specify the term commercial, if it applies when the owner is commercial or someone is just buying services. Mr. **José Martín Hernández** said there is no unique or precise definition of the term. Scheduled air transport is certainly commercial and it is transport. Non scheduled air transport may or may not be commercial. To be safe try to avoid doubts in the definition.

SESSION B

Making the most of past and current EU Collaborative Research

Session B was chaired by **Mr. José Martín Hernández**.

First presentation (B01) *“Introduction to the EPATS Project Results”*

was done by Mr. **Krzysztof Piwek** (Institute of Aviation, Poland)

Main ideas of presentation:

Main goals:

- Improving the energy efficiency of all modes of transport,
- to give travelers a free choice of transport mode - according to their need, and limited by their time value,
- replacing car trips by a personal aircraft in the distance over 300 Km

Consortium:

- 10 participants from 5 European countries

Project reports:

- Airfield database
- Aircraft database
- Reference aircraft selection
- Demand 2020
- ATM impact
- Environment and safety
- GA manufacturers capability

Conclusions:

- R&TD of GA creates real additional value for EU
- European GA community is emerging
- It is essential to support R&TD in GA area by establishing small brother of JTI “Clean Sky” with main goal: Technology Evaluator of Small Air Transport Aircraft

Second presentation (B02) *“SOFIA - Safe AutOmatic Flight Back and LandIng of Aircraft Overall Presentation”*

was done by Mr. **Juan Alberto Herrería** (ISDEFE, Spain).

Main ideas of presentation:

Project data:

- Budget: 4,997,984 €
- Duration: 36 months
- Start date: 1st September, 2006
- Consortium: 9 participants

Project goal:

Enabling the automatic return to ground of an airplane in the event of onboard hostile actions.

Sofia Core:

Flight Reconfiguration Function – enables to take over aircraft by onboard control.

Validation:

- I-23 Manager flight tests,
- DA42 Twin Star flight tests
- DA42 Flight Simulator

Third presentation (B03) *“CESAR Cost-Effective Small AiRcraft integrated project. 3rd call of FP6 EU”*

was done by Mr. **Karel Paiger** (VZLU, Czech Republic).

Main ideas of presentation:

Project data:

- Budget: 33,7M €, EC contribution 18,1 M€
- Duration: 36 months
- Consortium: 39 participants from 14 countries

Project goal:

Increasing European competitiveness in the field of small commercial aircraft from 5 to 15 passengers

Aerodynamic design:

- T1.1 - High fidelity design tools
- T1.2 - Advanced wing
- T1.3 - Flight Dynamics

Aerodynamic design:

- T2.1 - Operational loads
- T2.2 - New design approaches to advanced airframe structure
- T2.3 - New strength evaluation methods of advanced airframe structures
- T2.4 - Smart structural health monitoring
- T2.5 - Flutter prevention for small aircraft

Propulsion integration:

- T3.1- Advanced structure of small gas turbine engine
- T3.2 - complex power-plant control system
- T 3.3 - Environmentally friendly propeller propulsion

Optimized systems:

- T4.1 - Cost effective actuation
- T4.2 - Competitive technologies for air systems
- T4.3 - Integrated diagnostics and on-condition maintenance

Design concept integration and validation:

- WP5 - New design and development concept

Outcome:

- Technical achievements,
- Development of international cooperation in the GA sector,
- Evidence of long-term interest of GA industries in participation in EC funded programmes,
- Increase of visibility of GA,
- Demonstration of organizational and managerial competence of GA stakeholders to prepare and run RTD projects (even L2)
- Experience from CESAR project will enable to better target specific research challenges of GA within the next research projects

Fourth presentation (B04) “Assessment and Validation of Pioneering Concepts for Personal Air Transport Systems. Introduction to the PPLANE project.”

was done by Mr. **Claude Le Tallec** (ONERA, France).

Main ideas of presentation:

Project data:

- Budget: 4,4M €
- Duration: 30 months
- Start date: October, 2009
- Topic addressed: AAT.2008.6.3.3. Personal air transport systems
- Consortium: 13 participants from 11 countries
- Current status: negotiation phase (since May 13th)

Project goal:

Developing system ideas to enable individual air transport

- To avoid the ever increasing congestion on European roads
- To offer an alternative for the current transport system in new European Member States

Project description:

- Out-of-the-Box project as a starting point
- Implements a systematic approach to propose radical and novel ideas for Personal Air Transport System (PATs):
- Resulting concepts are analysed and compared
- Recommendations for implementation across Europe are given

Workpackages:

- WP1. Operational concept
- WP2. Security and safety
- WP3. Automation and control
- WP4. Human factors
- WP5. Environment
- WP6. Scenarios and recommendations
- WP7. Dissemination
- WP8. Management

Expected outputs:

PATs operational concepts for a safe and efficient operation of personal air vehicles

Discussion:

Mr. **Adriaan de Graaff** asked Mr. **José Martín Hernández** if there is a chance that other projects covering Small Aircraft Transport Systems will be funded, since PPlane, is large, almost 5M€, project covering all significant issues. Mr. **José Martín Hernández** answered that the community is much broader than just ATS. There is some interest in operation of not personal, but also larger aircraft. The commission preferring to fund many projects that, not being the same, can add value to the concept. 2 projects presented on the Workshop: EPATS and PPlane are touching some common issues, but are not the same, but rather complementary.

SESSION C

Common work on GA related proposals in light of envisaged topics and budget of the 3rd Call in Aeronautics

Session C was organized by Mr. **Andrzej Bogumił Podsadowski (PolSCA)**

First presentation (C01) “*Session C. Common work on GA related proposals in light of envisaged topics and budget of the 3rd Call in Aeronautics.*”

was done by Mr. **Andrzej Bogumił Podsadowski** .

Main ideas of presentation:

Presentation goal:

To present agenda for Session C

Working Session ALPHA: General Aviation & Air Transport System / GA research

Potential topics:

- Any idea to maximize energy efficiency and minimize environmental impact of GA
- 4 proposals sent in advance

Working Session BRAVO: Environmentally friendly GA

Potential topics:

- EPATS traffic
- Airline traffic
- Business traffic
- 7 proposals sent in advance

Working Session CHARLIE: Research for revitalization of European GA

Potential topics:

- Novel technologies
- Structural safety/Life cycle/SHM
- CS 23 PLUS
- 7 proposals sent in advance

Working Session DELTA: New Air Traffic Management and GA

Potential topics:

- Single pilot operations
- Less skilled pilot
- No Tower operations
- 5 proposals sent in advance

Presentation (C02) “*Topics in the FP7 next call relevant to small aircraft* prepared by Mr. **Adriaan de Graaff** was delivered to Workshop attendants in the paper version.

Then Workshop attendants split up in working sessions (4 separate rooms).

Working session ALPHA

General Aviation & Air Transport System / GA Research needs

Working Session ALPHA was moderated by Mr. **Adriaan de Graaff**.

Topics for discussions, according to agreed earlier meeting agenda:

- European Personal Aircraft Network (idea of EPAN - prof. **Rohacs**),
- GA Vision (EPATS-2, EPATS Vision, etc.)
- research for the benefit of GA

Mr. **de Graaff** greeted everyone and encouraged to submit proposals and gave floor to the first speaker.

First presentation (CAIfa01) “Interactive Personal Air Transportation System”
was done by Mr. **Wojciech Miksa** (Institute of Aviation, Poland).

Main ideas of presentation:

Study Goals:

- To increase passenger choice to best air transportation means connecting point A with B
- To reduce travel charges and time to destination

Potential of reducing cost:

- Increasing aircraft annual utilization
- Increase aircraft load factor

Project scope:

Net centric system:

- collecting orders from customers
- managing flight plan
- optimizing resources allocation

Workpackages:

- WP1. System integration
- WP2. Databases
- WP3. Software development
- WP4. Project management

Discussion:

First question from public was about forecasting demand. Mr. **Miksa** said that there is a place for forecasting the demand in task “Business model” in Workpackage 1. Another question was how the system would calculate the price of travel, while the demand is not known at the time of customer’s inquiry. Mr. **Miksa** said that he could propose two possible solutions. It is possible to offer a price based on demand currently present in the system. Alternatively, price may be based on predicted level of demand. Once the system is running for some time it is possible to predict demand level with adequate accuracy.

Mr. **Le Tallec** said that managing pilot time is an important issue. Another issue in the discussion was number of airlines using in the system. Because of competitive nature of the market, the operators would want to use the system to optimize their cost in order to gain advantage over competitors. Since minimum number of aircraft to benefit from optimization is 5, the system might be an opportunity for small operators combining their resources to increase their income. Mr. **Jaroslav Ružička** (rep. of EGAMA) said that from the producers point of view there does not seem to be any market for air taxi since from range of aircraft that could be used like Socata or Pilatus PC-12, most are used as corporate aircraft, only few are used by air taxi companies.

Second presentation (CAIfa02) “EPATS 2”
was done by Mr. **Krzysztof Piwek**.

Main ideas of presentation:

Main goal:

Assessing and further development of the role of small aircraft in the air transport system

Concept:

- Finding solutions for problems emerging in EPATS-Study project
- Creating Common Vision of European General Aviation Community
- Conclusions and recommendations to the SRA-3

Conclusions:

- Redefining financial tool
- Need more research (business models, fleet, novel technologies,)
- Redefined after Workshop discussion

Discussion:

Mr. **Růžicka** stressed out the need to cooperate with the producers. Mr. Piwek agreed and said that an idea like small air transport system is needed. EPATS provides aircraft requirements and assets the demand. A synergy between key players, including producers is necessary. The point is to try to create a common vision.

Third presentation (CAIfa 03) “EPATS VISION”

was done by Mr. **Andrzej Iwaniuk** (Institute of Aviation, Poland).

Main ideas of presentation:

Main challenge of the study:

- To explore a niche between Surface and Scheduled Air Transport.
- To provide wider use of small aircraft, served by small airports, to create access to more communities in less time, and to revitalize European GA Industry.
- To reduce „doorstep to destination” travel time, and to increase daily radius of action of people.

The purpose of this study is:

to establish a common basis for planning the development of Personal Air Transportation System as a predominant part of General Aviation.

Project deliverables:

- European Personal Air Transportation System – Common Vision 2020
- Personal aircraft regulations proposals.
- Joint Aircraft Requirements for EPATS 2020

Discussion:

Mr.**de Graaff** proposed to integrate EPATS Vision into EPTS 2. Mr. **Iwaniuk** agreed.

Fourth presentation (CAIfa04) “General Aviation in Transition (Projects for Redefining the GA).”

was done by Mr. **Jozsef Rohacs** (BUTE, Hungary).

Main ideas of presentation:

NASA SATS demonstrates – a new market was born

Transition drivers:

- traffic volume – increases into third dimension
- personal mobility
- it is a new market, new business
- technology is ready
- price of new technologies (like MEMS) is rapidly decreasing
- new safety philosophy required – pilots with limited practice
- integration into the general traffic system – SESAR

Needs:

- new operational philosophy
- radically new aircraft
- acceptable operational cost
- safe piloting with comon „drivers”
- new system of airports
- integration into the air traffic monitoring and control
- new service providing – rent a plane system

Hungarian results:

- Hungary is very active in small aircraft development
- A new project – Safe Fly

What is EPAN?

European Personal Aircraft Network

- Hungarian division: HUPAN: founded in 2009
- European division: *looking for founding members*

Objectives:

- Primarily:

- Catalyze and support the European personal air transportation related actions, programs and R&D
- Secondly:
 - Establish the channel of communication between the actors
 - Provide an overview of the related activities
 - Widen the scope of the actors coming from different domains
 - Facilitate the European PA operations (from the technical and operational aspects)
 - Assist the integration of PA into the European air transportation system
 - Provide guidelines on the targets and characteristics of the coming air transportation system (e.g. SESAR)

Working session BRAVO

Environmentally friendly GA

Working Session BRAVO was moderated by Mr. **Zdobysław Goraj** (rep. of EASN)

Session Bravo topics:

- novel concepts,
- engines, fuels/alternative fuels
- systems,
- noise and vibration,
- any other idea

First presentation (A05) “*Environmentally friendly GA*”
was done by Mr. **Zdobysław Goraj** (WUT)

Main ideas of presentation:

Central Eastern European EASN members:

- Central Eastern European Countries have high potential and tradition in aerospace industry
- Universities provide top level aeronautic education
- The potential is not effectively used

European Aeronautics Science Network:

- 272 institutions in EASN database
- 256 members

Interest Groups:

- Represent active technological and scientific cells of EASN
- 22 IG established so far

Interest Groups devoted to Light Aircraft Design and Optimisation” interest:

- Aerodynamics
- Light loading structure
- Avionics
- Modular, affordable design
- Hazardous states recovery
- Scaled models as new research tools

AEROVAN STOL aircraft:

- Utility passenger transport
- Cruising speed 300 km/h
- Maximum takeoff weight 4000 kg
- Range 1200 km
- 14 passengers
- Operation from short (150 m) unprepared runway
- High payload to takeoff mass ratio, better than current competition

Second presentation (CBravo01) “Segmented Extension Slotted Flap for General Aviation. Novel Trailing Edge High Lift Device Concept”

was done by Mr. **Michał Pokorski** (Institute of Aviation, Poland)

Main ideas of presentation:

The new aerodynamics conception of the airplane will be created and based of the HELIX Baseline elaborated by AIRBUS UK in HELIX programme.

Main goals:

- the new aerodynamics configuration will take high productibility level,
- their number reduction of parts number in the new aerodynamics configuration,
- reduction of specific fuel consumption and its impact on atmosphere pollution and greenhouse gases emission,
- improving cruise configuration,
- GA will be cheaper,
- characteristic it is very good and lift will be very large,
- construction is much better and lighter.

Question:

what system will be used – hybrid system based on good expirience.

Third presentation (CBravo02) “Environmentally friendly GA – Any ideas to maximize energy efficiency and minimize environmental impact of GA”

was done by Mr. **Zbigniew Pagowski** (Institute of Aviation, Poland).

Main ideas of presentation:

Many concerns already use biofuels

Main goals:

- three times cheaper,
- high pressure resistant,
- make a breakthrough in the current market structure of I generation biofuels
- research and develop cheap and environmentally-friendly aviation biofuel
- extend the idea of universal fuel for GA.

Actions to be taken:

active research in this subject.

Fourth presentation (CBravo03) “Flutter expert system for general aviation composite structures”

was done by Mr. **Daniel Szeląg** (Institute of Aviation, Poland).

Main ideas of presentation:

The increasing efficiency of propulsion systems and utilization of advanced composite materials increase the small aircraft speed limits. The flutter design drivers should be considered to avoid major aircraft parts modifications during the substantiating process. The newly elaborated system should allow a nearly real time dimensioning of the composite structure. That will be tremendous step ahead in comparison to the expert systems based for example on stiffness criteria.

Main goals:

- make a breakthrough in the current design process of small aeroplanes,
- research and develop cheap flutter software,
- establish the “Expert System” as a collaborative effort to accelerate development of cost effective aircraft structures using the enhanced design tool.

Workplan:

1. Control software of the expert system
 - aircraft configuration data

- simplified structural beam model data including factors for non-structural (software during preparation in CESAR project), mass evaluator data
- structural composite layout data
- flutter analysis method data
- 2. Beam stiffness interface
- 3. Mass distribution evaluator
- 4. Free vibration interface
- 5. Eigen modes – flutter interface (interface elaborated during TAURUS project)
- 6. Expert system Graphical User Interface (GUI).

Fifth Presentation (CBravo04) “Coupled Propulsion Unit”
was done by Mr. **Jacek Kowalik** (Institute of Aviation, Poland).

Main ideas of presentation:

Development and tests of prototype of innovative propulsion combining advantages of single engine, twin engine propulsion and contra rotating propeller systems. The system comprises two co-axial, contra rotating propellers, individually powered by its own engines. The engines are appropriately integrated so that they could be mounted in place of classical, single engine propulsion.

Main goals:

- increased airplane safety
- aircraft becomes twin engined
- decreased drag caused by propeller slipstream effects
- increased propulsion efficiency
- contra rotation provides counter to torque and gyroscopic precession effects decreasing engine mount load and therefore, its weight
- decreased propulsion system vibration level and thus increased comfort level
- increased reliability of structure gained by parts reduction.

Working session CHARLIE

Research to revitalization of European GA

Working Session CHARLIE was moderated by Mr. **Catalin Nae**

Topics for discussions, according to agreed earlier meeting agenda:

- Novel technologies – transfer/synergy with advanced RTD aerospace achievements
- Structural safety; Life Cycle Extension; Structural Health Monitoring for GA
- Potential concept of CS 23 PLUS - for ATS based on small a/c
- Technology Evaluator of Small Air Transport Aircraft

Charlie session moderator, Mr. **Catalin Nae** greeted all participants of the meeting and started presentation concerning key issues and main goals of the session.

First presentation title: (CCharlie01) “CHARLIE - Research to revitalization European GA”

Main ideas of presentation:

Topics for discussions:

- Novel technologies – transfer/synergy with advanced RTD aerospace achievements
Previous Framework Programmes contributed to development of aviation, can it be done for GA?
 - Manufacturing technologies
 - Composite vs “traditional” structure for GA
 - Flight control systems for GA
 - Avionics for GA
 - Certification issues
- Structural safety; Life Cycle Extension; Structural Health Monitoring for GA

- On-condition maintenance
- Predictive maintenance
- Prognosis and diagnosis
- Maintenance on-demand
- Potential concept of CS 23 PLUS - for ATS based on small a/c
 - SATS in Europe
 - New generation of small a/c
 - ATS based on small a/c
 - CS-23 PLUS
- Technology Evaluator of Small Air Transport Aircraft

Next moderator invited participants to present their proposal idea form.

Second proposal presentation: (CCharlie02) “SPSSA – Spin Prevention System in Small Aircraft” was done by Mr. **Bartosz Dziugiel** (Institute of Aviation, Poland)

Main ideas of presentation:

Main objectives:

Investigation on safety criteria and relevant test methods to minimize spin risk in small single engine aircraft.

Main goals are:

- Preliminary research - defining of aircraft spin resistance criteria and developing of new “anti-spin” systems and devices
- Flight tests - validating results in flight with use of I-23 Manager.
- Overall summary and recommendation.

The proposal will be the part of description of new EPATS aircraft requirements in flight safety area.

Proposals for cooperation in area:

- Theoretical spin analysis and elaborations.
- I-23 Manager – certified, 4-seat, single engine aircraft – over 300 spins realized.
- Possibility to conduct full flight test procedure.
- Possibility to design and build technology demonstrator based on I-23

Discussion:

Due to very similar subject, EVEKTOR proposed to present its proposal subsequently. Moderator agreed.

Third presentation: (CCharlie06) “SESRA - Single Engine Spin Resistant Aircraft” was done by Mr. **Pavel Růžička** (EVEKTOR, Czech Republic)

Main objectives:

Investigation on criteria of spin resistant aircraft in early design process and anti-spin modifications:

- analysis of suitable aerodynamic modifications
- creation of the methodology, how to design spin-resistant airplane
- manufacturing selected specimens for flight tests
- preparation of flight tests:
 - test program
 - instrumentation of the test plane
 - adaptation of the airplane for carrying specimens
- performing the flight tests
- evaluation of individual modifications impact on stall and spin behaviour

From among main anti-spin aerodynamic modifications remarked were:

Modifications applicable during early design:

- wing twist
- wing geometry (taper and aspect ratio, sweep angle, ...)
- tail unit geometry and conception

Modifications applicable during design and flight test:

- dropped leading edge
- fin

Modifications applicable during flight tests (cure)

- vortex generators
- turbulators
- ribbons
- stall strips

Main goals are:

- Significant increase of the safety of operation
Spin resistant airplane is much safer than that one of poor stall behaviour.
- Creation of methodology of designing the airplane as spin resistant straight from the beginning of the design process
Time and costs reduction during early design phase is much more efficient, than curing problems afterwards.
- Creation of proved methodology to cure possible problems
Known ways how to cure problems can save lot of effort than testing dead end variants.

Discussion:

During discussion appeared an idea not to compete but join efforts in the presented area instead. Mr. **Wolejsza** (Institute of Aviation, Poland) proposed to work together. Mr. **Růžička** noted that more important than anti-spin devices are trying to design spin resistant aircraft but in plain configuration to avoid deteriorating of aerodynamic performance. Moderator asked, who would like to participate in spin problem concerning project. The will to participate was declared by Institute of Aviation, Evektor, IBK, VZLU, INCAS, AFIT and CIRA, though CIRA representative was not completely sure. Evektor with IoA would be the project coordinators. Topic: (7.1.3.3) 3.3.1/3.3.2 Aerostructures / Systems & Equipment

Fourth presentation: (CCharlie03) *“LiRCS - Lightning Resistance of Composite Structure”*
was done by Mr. **Bartosz Dziugiel** (Institute of Aviation, Poland)

Main ideas of presentation:

Main objectives:

- To find safe, light and simple solution to protect composite structure from lightning strike.
- To elaborate methodology and recommendations concerning design and certifying procedures of lightning resistance in the case of light aircraft composite structure.

The proposal will be the part of description of new EPATS aircraft requirements in flight safety area.

Proposals for cooperation in area:

- High current intensity tests of composite structures
- High voltage tests of composite structures
- Methodology of structure design and tests for lightning resistance and meeting CS-23 requirements.

Discussion:

Moderator asked who is interested in the subject. Only PZL Świdnik declared potential interest to participate in lightning evaluations of composite structure. Due to low interest in the issue and lack of topic to be addressed project had to be turned down.

Fifth presentation: (CCharlie05) *“ACRA - Cabin Crashworthiness Prediction”*
was done by Mr. **Petr Štěrba** (EVEKTOR, Czech Republic)

Main ideas:

- Research of methodology of aircraft seat dynamic calculation
- Development of methodology for aircraft turnover dynamic calculation
- Research of aircraft material properties

Main objectives:

- Methodology of aircraft seat dynamic calculation

- Simplified criteria for aircraft design will be compared with turnover dynamic simulation
- Increasing passenger / crew safety and improving the structural crashworthiness by turnover, especially for small aircraft types
- Database of aircraft materials properties for simulations

Proposals for cooperation in area:

- Material research lab high speed deformation characteristics
- Final small airplane producer
- Dynamic test lab

Discussion:

Moderator asked who would like to participate in the project. Interest declared: IoA, WUT, IPPT, VZLU, INCAS, PZL, Tehnion, BUT, WrUT, AIT and perhaps IBK and Piaggio Aero. Topic : 7.1.3.3 Aerostructures

Sixth presentation: (CCharlie06) “SACC - Small Airplane Cockpit Climate”
was done by Mr. **Pavel Růžička** (EVEKTOR, Czech Republic)

Main ideas:

- General aviation and commuter category airplanes cockpit climate are usually not systematically solved (experience from previous design is used)
- Air condition and ventilation systems are not operating during engine OFF (parking, waiting for take-off) - overheating
- Not pressurized cabin - pollutants (fuel vapours, hydraulic liquid vapours, dust, etc.) can penetrate into cabin
- Lack of methodology to design ventilating and air-condition systems
 - optimizing manifolds and blowers from point of view of pressure drops and direction of flow
 - individual ventilation settings
 - using natural convection for ventilation (system of slots)

Main objectives:

Development of analytic and experimental environment for small commuter and normal class airplane design, regarding satisfaction of thermal comfort of passengers and crew requirements.

Subtasks:

- Reducing thermal inputs inside the cabin (i.e. reduce heat transfer, especially by solar radiation, into cabin)
- Suggesting a solution of standing airplane cooling by means of ventilation slots (natural convection)
- Preventing from lengthwise increasing of concentration of dangerous substances in a cabin (i.e. preventing from lengthwise flow)
- Optimizing manifolds to blowers from point of view of pressure losses and aerodynamic generated noise.
- Suggesting a system of individual ventilation settings

Benefits:

- rationalize airplane structure
- increase the comfort of passengers and crew (and thus operational safety)
- create conditions to increase value of airplane

Supposed members of consortium

EVEKTOR, Spol.s r.o. - proposal coordinator

TU Brno - Energy Institute - Dept. of Thermodynamics and Environmental Engineering

Proposals for cooperation in area:

- Producer of environmental systems
- Small airplane producer

Discussion:

Moderator – Mr. **Catalin Nae** noted that this proposal idea must be included in “Noise and vibration” topic. Willingness to participate in the program was exposed by: EVEKTOR, IoA, IPPT, PIAGGIO, WrUT, TUB, and perhaps IBK, AIT, BUT, INCAS, VZLU. Project coordinator will be EVEKTOR and/or IoA.

Working session DELTA

New Air Traffic Management and GA

Working Session DELTA was moderated by Mr. **Tony Henley**.

First presentation (CAAlpha04) *“On-board and ground equipment for GA”*
was done by Mr. **Daniel Rohacs**

Main ideas of presentation:

Separation management and collision avoidance for personal air transport system.

Main goal:

- development and definition of the joint concept of the ground on-board equipment system for small aircraft.
- Decrease costs for the civil passenger aircraft.

Workplane:

- definition of the needs in new ground and on-board equipment for the small aircraft
- analysis of the human factors, safety and security aspects,
- development of the operational concept,
- investigation on development of the ground equipment,
- investigation on development of the aircraft on-board system,
- Economical benefit analysis,
- Dissemination and management.

European Air transport system improve collision avoidance system for GA. Create similar system like TCAS but based on GPS which should be cheaper, smaller and lighter.

Second presentation (file not delivered) *“Personal Aircraft in the SESAR ATM System”*
was done by Mr. **Frans Van Schaik** (NLR, Netherlands).

Main ideas of presentation:

GA should be used to test and check results given by SESAR project.

Main goals:

- safe and security,
- tests of SESAR ideas,
- communication and data processing of flights,
- UAV projects but not pilot-pilot,
- how achieve safe level in one-pilot-aircraft.

Main objective:

To investigate how Personal Aircraft can find their way in the new European Sky and new ATM system. The Personal Air Transport system will also serve well to pioneer SESAR and speed up the SESAR R&D. The idea is to use a Personal Aircraft as an experimental platform for the technologies and procedures.

Suggestions:

- Trajectory Based Operations for Personal Aircraft
- Dynamic Sectorisation
- Controlled versus Unmanaged Airspace
- ATSAW in-flight and on-ground
- Improved Low Visibility Procedures
- Remote Tower Operations and Remote Control
- Precision Minima for all Runways
- Tailored Flight Paths
- Single Pilot Operations
- Pilot support system

Actions to be taken:

Create a consortium including Air Navigation Service Provider, Small Airline or Aircraft Construction Company, R&D partners, Avionics Manufacturer, Airport.

Third presentation (file not delivered) “Advanced Surface Movement and Control System”

was done by Mr. **Henley** on the base Project Idea Form delivered earlier by **Teodor-Viorel Chelaru** (UPoB RCAS,Romania) because he was absent.

Main ideas of presentation:

Improvement of the operational security and solving the problem of increasing ground traffic on the airports. Advanced Surface Movement and Control System (A-SMCS) is proposed, consisting of a millimetric wave, radar and a processing system, able to detect and locate non-cooperative targets, intruders and obstacles.

Summary:

Solution based on the project's idea already exist. Proposition of the automatic landing system for GA integrated with GPS and creating advanced methods of image converting VFR into IFR.

Status of working sessions after first day

Mr. **Adriaan de Graaff** presented Working Session Alpha results:

2 projects in total:

- EPATS 2
- IPATS project was to be discussed to decide if it should be a ITC theme project or transport theme project.
- proposal of EPATS 2 was suggested to be considered to submit covering topic AAT.2010.7-12

Mr. **Tony Henley** presented Working Session Delta results:

4 to 5 project proposals in total:

- Separation management, replacement or alternative for TCAS
- Avionics to support single pilot operation in the new ATM operations
- Avionics to perform safe operation at uncontrolled airports and airfields
- Integrity management, looking at concepts of architecture and regulatory issues
- Integrated modular avionics

Mr. **Catalin Nae** presented Working Session Charlie results:

7 proposals considered in total:

- Spin resistant aircraft by 2 different entities: IoA and Evektor, it was decided that these proposals should be merged
- Cabin crashworthiness, this topic produced 2 proposals to consider
- Cockpit climate
- Lightning resistant composite structure
- Adaptive impact absorption structure was not presented due to the lack of presentation

Mr. **Zdobyslaw Goraj** presented Working Session Bravo results:

7 proposals in total, 4 of which were considered:

- Segmented extension slotted flap. Prof. Goraj doubted that this device contributes much to greening of the aircraft and proposed that such device could be used in another project AEROVAN proposed by WUT.
- SECOGEN-GA, biofuels for GA. Project definition should be improved to show what the project is trying to gain before submitting a proposal to the Commission.
- Flutter expert system for GA composite structure. A similar project was accepted in the 2nd call, so authors should be careful as the commission will not fund the same topic twice.

- Coupled engine propulsion unit. The noise might be an issue. Further discussion was needed to decide whether to submit a proposal

European Commission Officer, Mr. **José Martín Hernández** gave a speech to conclude the 1st day of the meeting.

Mr. **José Martín Hernández** said that it is not his role to tell which project proposal is good and which is wrong, he could only tell of boundary conditions that result from EC policy.

Mr. **Hernández** encouraged to submit projects aiming at creating roadmaps, as they contribute to policy making. There was not much said during presentations about cost of projects. The cost should go between 2 to 4 M€, but there should be no proposals with cost reaching margin of 5 M€, for instance 4.9999 M€. With total budget of 100 M€ the EC would like to fund about 30 projects, which yield about 3 M€ per project, and the cost should not be much higher.

The project scope should be clearly stated, in AEROVAN project it was stated that an aircraft was to be developed, but no project or key technologies were shown to be developed there.

The biofuels themselves will not be funded, but a project to find an application of biofuels in aviation might be funded.

Funding projects covering climate in cockpit are closed, the commission is only interested in abating noise and vibration.

There was only one project dealing with safety, and the EC is interested in the subject.

Concluding his speech, Mr. **José Martín Hernández** encouraged to do roadmaps, create fewer larger and strong, in terms of quality, proposals.

SECOND DAY - 8th July 2009 - Wednesday

SESSION C – continuation

Common work on GA related proposals in light of envisaged topics and budget of the 3rd Call in Aeronautics

Session C moderator, Mr. **Podsadowski** welcomed everyone and presented agenda for the remainder of the Workshop. Then he gave the floor to Mr. **de Graaff**.

First presentation (no file) “Results of yesterday meeting”
was done by Mr. **Adriaan de Graaff**

Main goal of the presentation:

To overview projects that emerged during 1st day of the Workshop.

Projects covered:

1. EPATS 2 study,
2. Seamless air transport/ IPATS
3. Novel concepts?
4. Separation management and single pilot ops
5. Situational awareness single pilot ops
6. Safe landings at uncontrolled airfields
7. Integrity management
8. Integrated modular avionics
9. Spin resistant aircraft
10. Crash behaviour
11. Climate in cockpit/ cabin
12. Lightning resistant aircraft
13. Adaptive impact absorption
14. Extended slotted flaps
15. Aerovan concept
16. Demo biofuels
17. Aero elastic behavior of composite aircraft
18. Coupled engines

Discussion:

Mr. **Goraj** explained that the Aerovan project goal was not to design an aircraft, but investigate technologies necessary in this type of aircraft. Mr. **de Graaff** said that scope of Level 1 projects is limited and integration of technologies into a demonstrator is possible in a Level 2 project.

Second presentation (A03) “EGAMA introduction”
was done by Mr. **Jaroslav Ružička** (rep. of EGAMA).

Main ideas of presentation:

EGAMA overview:

- Founded in 2007 within ASD, represents 12 European GA manufacturers.
- EGAMA purpose is to be a common forum of dialogue with EU institutions.
- EGAMA aims to foster common coordinated industrial view on strategic areas.

Recommended issues to consider:

- Improved safety of flight.
- Post-crash survivability.
- Reducing environmental impact.
- Optimization of production techniques.

- Reducing operational cost, improving maintenance safety levels and facilitating worldwide support.

Then Workshop attendants split up in working sessions (4 separate rooms) again.

Working session ALPHA - continuation

General Aviation & Air Transport System / GA Research needs

Working Session ALPHA was moderated by Mr. **Adriaan de Graaff**.

After reviewing all topics in the Workprogram for Call 3 it was mentioned that IPATS project does not fit into any topic in the document. Mr. **de Graaff** suggested that IT tool for PATS project might fit in ITC theme in FP7. Mr. **Miksa** agreed. It was suggested that IPATS project will go into EPATS 2 project as one of the workpackages.

Initial workpackage topics for EPATS 2 had been suggested:

WP1	Business case
WP2	Seamless travel requirements
WP3	SESAR
WP4	Vehicle technologies
WP5	Pilot requirements
WP6	Standardization & certification
WP7	Industrial capabilities
WP8	Roadmap
WP9	Management & dissemination

During session, the following representatives declared the will to participate in the project:

- Francisco Munoz Sanz, INTA, Spain
- Claude Le Tallec, ONERA, France
- Catalin Nae, INCAS, Romania
- Meine Oosten, TUDelft, The Netherlands

Working Session BRAVO - continuation

Environmentally friendly GA

Session BRAVO was moderated by Mr. **Zdobysław Goraj**

First Presentation (CBravo06) “Advanced turboprop, propfan and turbojet bypass engines for GA and light airplanes”

was done by Mr. **Sergiy Dmytriiev** (SE Ivchenko-Progress, Ukraine).

Main goals:

- designs of advanced turboprop, turbopropfan (Open Rotors) and turbofan (geared ultrafan including contrarotating configurations) engines

- improving fuel effectiveness and low emission levels and an automatic control system (FADEC type) for prospective GA and light airplanes.

Second presentation (*file not delivered*) “*Increased engine efficiency*”

was done by Mr. **Yuriy Guro** (SE Ivchenko-Progress, Ukraine).

Main ideas of presentation:

Development of engine control system based on Fly-by-Wire concept. New control strategies will be introduced including FADEC/EEC, fuel pump control system and engine maintenance module.

Main goals:

- lower fuel consumption,
- decrease weight,
- increase engine efficiency,
- increase engine life cycle and prolongation of time between unscheduled maintenance.

Workplan:

- design automatic control system for turboprop engines, alongside with the application of the existing reliability and effectiveness improvement methods it is required to study a possibility to implement following:
 - a variable propeller rotational speed to obtain high values for power turbine efficiency; .
 - optimization of engine and propeller parameters to obtain the assigned thrust with a minimum engine power (minimum specific fuel consumptions);
 - application of advanced sensors and actuators.
- design automatic control system for turboprop engines, alongside with the application of the existing reliability and effectiveness improvement methods it is required to study a possibility to implement:
 - a variable-area nozzle control;.
 - accessory driving by electric motor;
 - a wiring unit control;
 - application of advanced sensors and actuators.

Conclusion:

Create a new concept of fuel metering pump.

Working session CHARLIE - continuation

Research to revitalization of European GA

Session CHARLIE was moderated by Mr. **Catalin Nae**

First presentation: (CCharlie09) “*PSAS – Predictive Stall Alerting System*”

was done by Mr. **Edward Babiasz** (IoA, Poland)

Main ideas:

- Predictive stall alerting system (PSAS) combines signals of speed (GPS, pitot), change of speed, configuration (flaps, landing gear,...), angle of attack, angular rates.
- This system may allow avoiding dangerous situations in landing with turn.
- Including this project into spin proof test due to the same requirements for in flight testing.

Main objectives:

- Conceptual project- algorithms, methods of measurements of low speed and angle of attack
- Hardware and software design
- Implementation (demonstrator, prototype)
- Verification (functional tests, environmental tests, tests on aircraft model, in flight tests).

Discussion:

Moderator asked participant to expose their opinion, Due to lack of interest in participating in this project idea was refused.

Second presentation: (file not delivered) “Composite joints of structures”

was done by Mr **Daniel Dębski** (Warsaw University of Technology and IoA).

Main ideas:

The idea of the composite joints is an alternative solution for a classical kind of joints (welded, pin, riveted, screw and glue joints).

The idea of composite joints is based on joining elements by composite materials.

- the possibility of construction of the joint in an optimal way for loads transmitting
- the composite joint allows joining the elements made of different materials.

Conclusions:

- The possibility of construction of the joint in an optimal way for load transmitting
- The composite joint allows to join the elements made up of different materials
- The damage process characterizes increasing load and high joint extension
- The damage is not a violent process and it is indicated by high joint's extension

Objectives:

- “Formation of complex background sources and methodology for using the advanced structure type, for specific parts of aircraft structure”

Description of work/Technical approach:

- Specimen design of selected joints of the airframe structures in the composite joints variant.
- Static and fatigue tests.

Deliverables:

- Evaluation of the composite joints idea - an alternative solution for classical kinds of joints.

Expected results:

- users could join elements which are made of different materials
- the possibility of construction of the joint in an optimal way for load transmitting
- high static and fatigue strength
- composite joints are easy to make and easy to repair

Discussion:

Warsaw University of Technology, Wrocław University of Technology and IoA were willing to participate in this project but due to lack of other European partners subject had to be refused.

Third presentation: (CCHarlie04) “Project Proposal Active / Passive Acoustic SHM System for Impact Detection (APASHI)”

was done by Mr. **Ernst Semerad** (AIoT, Austria).

Main ideas:

Passive method a combined Passive / active acoustic method is proposed for future SHM systems. The passive – acoustic emission – technique will be used for the accurate localization of the impact. Once the impact was located the system will be switched to the active.

Development and Application of an Active / Passive Acoustic SHM System for Impact Damage Detection in primary composite structures using cheaper and easy to install or even embeddable sensors.

Objectives:

- New Orthotropic Location / Damping Algorithm for Acoustic Emission
- Direct Impact damage detection by Acoustic Emission
- Impact Damage Quantification by Acoustic Emission on Demand Algorithm
- Assessment of cheaper sensor for AE Applications

Proposed project steps:

- Identification of relevant types and sizes of damages for a prototype primary composite structure

- Analyses of the necessary actuator / sensor configuration
- Definition of the hardware / software requirements
- Development / Procurement of the necessary hardware
- Development of the damage quantification algorithm
- Verification of the system on simplified substructures and the final prototype structure under simulated real environmental conditions

Discussion:

Moderator asked who would like to participate in the project. Interest exposed: IPPT, Evektor, INCAS, IFM, Tehnion, BUT and perhaps VZLU. Austrian Institute of Technology will be a project coordinator and topic addressed to: 7.1.3.3 Aerostructures / systems&equip.

Fourth presentation: (CCharlie07) *“Designing composite airframes for repairs”*
was done by Mr. **Piotr Czarnocki** (WUT, Poland)

Main ideas:

- identify typical damage depending on mission of an aircraft, then
- develop design guide, since
- repair problems can be made easier if sufficient consideration to possible future repairs is given in design stage

Objectives:

Some optimization procedure taking under consideration all ups and downs (e.g. possible repairs less expensive but worst performances).

Discussion:

Moderator asked who would like to participate in the project. Nobody exposed interest. Project had to be refused.

Working session DELTA - continuation

New Air Traffic Management and GA

Session DELTA was moderated by Mr. **Tony Henley**.

In this session, since all presentations were presented the day before, the whole meeting was continuation of the previously presented topics.

Summary of the working session Delta:

Conclusion of the session were the most important ideas and directions for GA ATM:

- SEPARATION MANAGEMENT Collision
- Avionics to support single pilot operation in the new ATM operations
- Safe operation at uncontrolled airports
- Integrity management
 - What is required – integration architectures
- Integrated modular avionics
 - general call not small aircraft specific
 - no interest to support from the team

It was concluded that important is to concentrate on one or two proposals:

- Hazard management for small aircraft, AAT.2010.3.3-3. Avionics

- Issue of regulation and cost for small aircraft, AAT.2010.4.2-5. Avionics

SESSION D

Cooperation on common proposals – chance for everybody

Session D was moderated by Mr. **Adriaan de Graaff**

Status of working sessions after first and second day of workshop

Mr. **Adriaan de Graaff** presented Working Session **Alpha** results:

1 project proposal: EPATS 2. Roadmap, operational concept, involve industry

- IPATS project was to be part of EPATS 2 project. IT tool recommended for ITC theme.
- proposal of EPATS 2 was suggested to be submitted, covering topic AAT.2010.7-12
- Workpackages for the study were considered.

See also: *D01-de Graaff.pdf*

Mr. **Zdobyslaw Goraj** presented Working Session **Bravo** results:

7 project proposals:

1. **CPU**. Coupled engines - (Safety) IoA, WUT, WZL, Aerotec
2. **SESF-GA**. Segmented extension slotted flaps – Helix partners, IoA, Piaggio, Evektor, WUT,
3. **AEROVAN**. Low noise Aerovan concept – WUT, Piaggio, Evektor, BUT, IoA, Ivchenko, VGTU,
4. **SECOGEN-GA**. Demo biofuels – IoA, WULS, Bioenergy, Comoti (R),
5. **FLEX**. Aero elastic behaviour of composite aircraft – IoA,
6. **ABCDE**. Increased engine efficiency (400-1000 HP), TURBOSHAFT, PROPFAN – Ivchenko, Unis, Jihostroj, Technion, VZLU, IoA, Delft, CUT, NAU (KhAI) , Comoti (R),
7. **GA_TP_TF**. Perspective turboprop & turbofan engines for GA – Ivchenko
 - Combined Perspective turboprop and turbofan engine project with increased engine efficiency project and coupled propulsion unit project into single project proposal.
 - SECOGEN-GA, biofuels for GA. Project definition should be improved to show what the project is trying to gain before submitting a proposal to the Commission.
 - Flutter expert system for GA. A similar project was accepted in the 2nd call, so authors should be careful as the commission will not fund the same topic twice.
 - Coupled engine propulsion unit. The noise might be an issue. Further discussion was needed to decide whether to submit a proposal

See also: *D02-Goraj.pdf*

Mr. **Catalin Nae** presented Working Session **Charlie** results:

4 project proposals:

1. **SESRA/SPSSA**. Spin resistant aircraft, Topic 7.1.3.3 Aerostructures/Systems and equipment
2. **APASHI**. SHM for GA, Topic 7.1.3.3 Aerostructures/Systems and equipment
3. **ACRA**. Cabin Crashworthiness, Topic 7.1.3.3. Aerostructures
4. **SACC**. Cockpit climate, Topic 7.1.3.1. Noise and vibration

See also: *D03-Nae.pdf*

Mr. **Tony Henley** presented Working Session **Delta** results:

1 project proposals GA-AVIONICS:

- Hazard management for small aircraft, AAT.2010.3.3-3. Avionics
- Issue of regulation and cost for small aircraft, AAT.2010.4.2-5. Avionics

See also: *D04-Henley.pdf*

Total: 13 proposals.

Speech of CIRA Director General Mr. **Massimo Cavaliere**

Mr. **Cavaliere** thanked for the possibility to give a speech during the workshop. The topics in Work programme were very important to CIRA, because Italy government is investing large amount of money and resources to support Italian industry on regional level. Lombardia, Piemonte, Campania and Lazio are collaborating to create, sustainable transportation system. CIRA is supporting these actions. CIRA is interested in reducing time to market. They have the possibility to test new technologies like new wings, engines, fuels, etc. Rte private industry is interested in participation in programs, as it is an opportunity to conduct research develop and develop innovations. Small sums of money were not interesting. Mr. **Cavaliere** emphasised possibilities existing in Mediterranean Sea region. Mr. **Cavaliere** noted, that in Campania region, where CIRA is located, there was a lot of demand for new proposals, or new offer for the programme. The community must support that kind of program.

Next Mr **Graaff** discussed how to increase success factor.

He remembered what was in first day summary done by Mr. **José Martín Hernández**.

He indicated that EC is waiting for:

- 1) **Roadmap for engaging small aircraft in European ATS (Air Transport System)** – could be EPATS STUDY (Topic AAT.2010.7-12 Assessing and further developing the role of small aircraft in the air transport system)
- 2) **Single Pilot operation as a starting point to GA Avionics** (Topic AAT.210.3.3-3 Avionics – Advanced concepts and technologies to counteract hazards specific to the flight operation of small size aircraft operating in non-scheduled flights)
- 3) **Novel Concepts - it could be AEROVAN** but not as aircraft project but as a set of novel technologies oriented for "novel concepts" + safety + low noise + low emission (Topics AAT.2010.6.3-3 Personal air transport systems and AAT.2010.6.2-1 Novel air transport vehicles)
- 4) **The rest of pre-proposals could start in traditional domains as aerodynamic /structures /propulsion/production** but in these domains competition is intense. So good strategy for increasing chance for success could be to combine single idea proposals for exhaustive, comprehensive projects - for example:
 - a) **GA ENGINES** - oriented for low noise & low emission, biofuel, coupled (i.e. piston +electric) areas
 - b) **GA SMART TECHNOLOGIES** - transfer/synergy with advanced aerospace achievements
 - c) **GA HAZARDOUS STATES** - crashworthiness, spin, lightning, thermal shock
 - d) **GA COMFORT** - cabin climate, noise & vibration, pressure, bugs, toxically fire emissions

Workshop attendants have left the decision to combine or work out with separate proposals to the project leaders.

It has been noted that it could be useful for whole European General Aviation Community to keep track of development of the proposals. It has been suggested that Institute of Aviation could list the chosen GA projects, monitor the status of their preparation and make them accessible to our Community. This kind of activity is logical and expected also by The European Commission.

To achieve this aim it is necessary to report all necessary, subsequent developments to the IoA (the name of project, its requested partners, stage of progress and other relevant details). Project Leaders or designated proposal managers, responsible for proposal submission, should prepare these reports and send them once a month to the Institute of Aviation.

In Institute of Aviation the proposal tracking process will be organized by Krzysztof Piwek, (his email address is khp@ilot.edu.pl) to whom the reports should be sent.

SESSION E

Next steps

Session E was moderated by Mr. **Zbigniew Wolejsza** (Institute of Aviation, Poland)

First presentation (E01) “Need for EGAC Association”
was done by Mr. **Zbigniew Turek**.

Why new association is needed:

- Need for a roadmap for the implementation of the „Agenda for a Sustainable Future of General and Business Aviation”
- Need for Safe and Efficient European Air Transportation System (incorporating GA)
- Endorsing the Lisbon Strategy by creation of SMEs and giving an opportunity to „small aero countries” for an access to High technology

Purpose:

- Dialogue with EC institutions, MS, local and regional authorities
- Establishing and maintaining contacts with all relevant authorities, associations
- Cooperation with manufacturers, R&D entities

Stakeholders:

- Manufacturers
- R&D entities
- EASA
- Airspace users
- Infrastructure providers
- Airport managers
- GA service providers
- Others

G&BA areas:

- R&D
- Environment
- Certification
- Manufacturing
- Others

Mr. **Zbigniew Wolejsza** closed the Workshop, saying that the meeting was fruitful, having discussed more than thirty ideas generated by European GA Community. Workshop attendants reached consensus in the area how to increase success factor in 3rd Call FP7. They had managed to rank pre-proposals and to limit their number down to 7 proposals.

It is important to improve formula of such General Aviation Forum. It is necessary to maintain and stimulate contacts and personal friendships. It is also crucial to show European Commission that European General Aviation Community knows how to cooperate - even when being still “atomized”, it can reach consensus in particular matters.

Institute of Aviation is offering support in these activities – at first it could be keeping track of chosen proposal development process. At a later stage IoA could provide help and experience in organization of particular proposal workshops.

Mr. **Wolejsza** thanked everybody for attending the Workshop.