Agenda Item 9.3.

Report Expert System & Expert Groups

Beat Neuenschwander, Executive Director

Agenda

- General Overview of the Expert System
- Actual situation of the Expert System and Expert Groups
- Tasks 2013 to the Expert Groups
- «The UAS challenge» – measures taken by FAI
- Planned actions for 2014

Expert Group results 2013, presented by the PoC’s:
- Airspace AEG Günther Bertram
- Navigation NEG Lars Holmström
- Regulation REG Otto Lagarhus
- Safety SEG Otto Lagarhus
- New Technology NTEG Visa Matti Leinikki
- IT ITEG Visa Matti Leinikki

1. General overview

1.1. The “Expert System” in FAI’s Executive Organisation

FAI Expert System

Air Sports Commissions AEC Presidents Group

FAI Expert System

Aircraft AEG
Airspace AEG
Navigation NEG
Regulation REG
Safety SEG
New Technology NTEG
IT ITEG
Marketing and Com. MCEG

FAI’s Aeronautical Expertise & Support

- for all Bodies in FAI
- as FAI-Observers by ICAO and by other International Organisations

-...
1. General overview
1.3. The benefit of the “FAI Expert System”
- FAI is able to handle a lot of new challenges with the Expert-System composed of Expert Groups and TC’s.
- Efficient system with clear defined goals, mid-term action plans and standardised Tasking & Reporting
- Output in a wide field of technical expertise in favor of the whole FAI: EB, NAC’s, ASC’s, …
- Information & results to all members at the same time by Head Office
- Strengthen FAI: «showing the flag of airsports» by ICAO and other international aviation organisations!

Agenda
- General Overview of the Expert System
- Actual situation of the Expert System and Expert Groups
- Tasks 2013 to the Expert Groups
- «The UAS challenge» – measures taken by FAI
- Planned actions for 2014
- Expert Group results 2013, presented by the PoC’s:
  - Airspace AEG Günther Bertram
  - Navigation NEG Lars Holmström
  - Regulation REG Otto Lagarhus
  - Safety SEG Otto Lagarhus
  - New Technology NTEG Visa Matti Leinikki
  - IT ITEG Visa Matti Leinikki

2. Actual situation and experiences
2.1. Actual Structure
- 6 active Expert Groups PoC’s:
  - Airspace Expert Group AEG Günther Bertram GER
  - Navigation Expert Group NEG Lars Holmström SWE
  - Safety Expert Group SEG Otto Lagarhus NOR
  - Regulation Expert Group REG Otto Lagarhus NOR
  - New Technology Expert Group NTEG Visa Matti Leinikki FIN
  - IT Expert Group ITEG Visa Matti Leinikki FIN
  - Airports Facilities Expert Group FEG planned but not yet realised
  - Marketing eCom. Expert Group MCEG requirement has to be checked

3 Technical Commissions
- Medico-Physiological TC CIMP
- Education TC CIEA transition in Exp Group ?
- Environmental TC EnvC transition in Exp Group ?

3. Tasks 2013 to the Expert Groups
- Tasking/reporting process:
  - Tasking in January to all EG’s
  - First feedback from PoC as interim-reports in June
  - Final report mid September to HO (official report to GC)
- Task lists are on the FAI-Website
- Reportings from PoC to EB/HO are also in the FAI Website
- If needed, a Skype-meeting will be organised by PoC
- If requested, special informations from PoC’s to EB/HO, NAC, ASC …

2013 problems observed
- Some experts must be «waked-up» from time to time by PoC’s
- HO-priorities in 2013 more by FAME, Anti Doping, Competitions etc
- NT- and IT- EG’s with no/reduced output (no tasks from HO in 2013)
3. Tasks 2013 to the Expert Groups

Example:

**Task for NEG 2013**

1. Make a deeper study about the «sense and avoid» technology for UAV’s and the consequences for VFR traffic (needed equipment?). Propose actions to take for FAI.

A special top-level briefing to FAI, about first experiences with «sense and avoid»-tests in VFR airspace, done by swiss government, is planned for 2013.

2. Establish a list about important criteria for future cockpit-avionic equipment in sports aircraft, to guarantee the airports development (light and low-cost features) and to be accepted in new defined airspace structures

3. Provide a suggestion for further (future) tasks for navigation issues. Highest priority should be given to navigation matters of global importance impacting airport activities. These suggestions should be forwarded ...

4. «The UAS challenge» – measures taken by FAI

- UAS (RPAS) developments in wide areas, UAS-activities worldwide
- UAS are a challenge for GA / airsports
- FAI is watching this quick developments with some concerns
- The main problem we locate, is the integration in Civil Airspace, mainly in uncontrolled VFR-airspace with consequences for all airsports
- „Sense and Avoid“ capability is essential for UAS-ops in civil airspace.

To ensure UAV-missions in civil airspace, it would not be acceptable:

- Restrictions in airspace
- Rigid regulations for GA
- Cost-driving regulations
- Need of special avionic equipment for other airspace users
- Any compromises in safety
- ...

4.1. Actions from EB and HO

**Actions done in 2013:**

- Tasking Expert Groups with new issues
- Coaching/supporting/monitoring PoC’s / Expert Groups
- Nomination of new (or exchanged) Experts in Expert Groups
- Organising and chair a special UAS meeting for FAI-Experts
- Informations about results to NAC’s and Commissions
- Organising the presentations for 107th FAI Gen Conf
Agenda

Session 1:
- FAI - Welcome adress
  FAI Executive Director
- FAI’s Organisation with Expert System
- UAS – a challenge for world airports / FAI

Swiss Airforce
- 15 year experiences with UAS-operations
- Missions in complex civ. / mil. airspaces

Lunch break

Session 2:
- armasuisse (swiss defence procurement agency)
  PM Unmanned Aircraft Syst
- Evaluation of a new MALE-UAS for Switzerland
- Tests and research of “sense&avoid”- avionics
- Swiss requirements for UAV-operations in controlled and uncontrolled airspaces

Conclusion / Farewell adress
FAI Executive Director

Speakers and Participants

Speakers from the SWISS Government / Departement of Defence:

- Swiss Airforce: Cdr Adrian Fischer, Cdr 14th UAS-Train Command
- armasuisse: Mr Roland Ledermann, PM Unmanned Aircraft Syst

FAI-Experts: Participants from 6 Nations:
- FAI Executive Director’s: Beat Neuenschwander, Switzerland (Chair)
- Expert Group Navigation: Lars Holmström / PoC, Sweden
- Expert Group Airspace: Günther Bertram / PoC, Germany
- Expert Group Regulation: Philip Bartschi, Switzerland
- FAI CIAM Representation: Massimo Semoli, Italy

Guests from national civil aviation authorities
- Mr. Axel Maubach, Head Airspace Management / skyguide, Civil & Mil Air-Nav Services
- Mr. Xaver Heinzer, Chief Operations, Zurich
- Mrs. Fiona Lombardi, Section Airspace, BAZL, NCAA, Nat Civil Aviation Authority
- Mr. Markus Farner, Section Development and Projects

Why this meeting in Switzerland?

EU-nations, US and many other countries are working on UAS issues.

We have organised this meeting in Switzerland due to the fact that:
- Switzerland has many years of practical experiences in this field
- Switzerland has a common civil-military managed airspace (unique in Europe)
- The Swiss airspace is narrow, very complex and challenged by the topography (mountains up to FL 130)
- Swiss Airforce (SAF) flies since 15 years with UAS in this complex airspace and is the most experienced Airforce in Europe with UAS-operations integrated in civil airspace (VFR and IFR)
- Swiss Civil/Military Air Navigation Services and NCA are fully involved in the process
- The actual Swiss UAS «Ranger» successfully passed several safety assessments, conducted by skyguide.

Conclusion

- The Swiss Air-Forces accomplished more than 4300 missions (7500 flight hours) with different payloads/sensors in civil airspace categories C, D, E and G
- 25% civil-government «live-missions»:
  - Customs (border control)
  - Police (traffic observation, security)
  - Fire-fighters (forest fires)
- 25% military «live-missions»
- 50% military «training-missions»
  - The UAS is certificated for VFR- and IFR-operations (failsafe system)
  - The UAS is considered as a «mil. aircraft» with crew on ground
  - The 2-man-crew consists of a UAS-pilot with ATPL or CPL license and a payload operator with PPL license (failsafe)

Actual operational specifications for ADS-95 «Ranger»:
- A chaseplane is required for VFR-ops in airspace E and G (the chaseplane flies in formation with the UAV ca. 50m)
- Allowed operations without chaseplane:
  - VFR missions in segregated areas
  - VFR and IFR missions (day and night) in all airspaces C and D in Switzerland
  - VFR missions at nighttime
Airspace structure Switzerland

UAS-mission in CTR Zürich

Conclusion
New generation of UAS
The Swiss Government is evaluating a MALE-UAS (medium alt. long end.) with 16m wingspan to replace the existing UAS «Ranger» in the next couple of years (procurement progr. 2016, op-readyness early 2018). One of the goals is to operate autonomous, flying VFR- & IFR-missions in all civil-airspace categories without chaseplane.

Next step: to evaluate a technology without any impact or specific regulations for other airspace users!
- Aircrafts equipped with ADS-B, FLARM, XPDR Mode S etc. are recognized by UAS. The information is displayed in the ground-control-station to provide best situation-awareness to the UAS pilot.
- Different technologies as electro-optics, IR and Radar will be tested so as to be able to detect all airspace users (incl. gliders, balloons, paragliders etc) without XPDR or other tech. equipment.

Goal: No negative impact for GA / airsports!

Sense & avoid tests
«Sense and Avoid» flight tests are planned in 2013 and 2014.
- A highly modified Diamond DA-42 will be used for the tests. The Test-aircraft is capable of flying with and without crew on board. It is at the same time a manned aircraft or an UAV depending on the test programme and results.

The tests started in summer 2013.
First phase:
Tests with electro-optics sensors and a «sense and avoid» software.

ELBIT, «HERMES 900»

Short List Candidates

IAI, «HERON 1»

Sense & avoid tests

armasuisse test-airplane R-711 (special DA42)
Sense & Avoid requirements

S&A requirements (FAA / EASA)
Year: > 2020?

S&A requirements (skyguide, SAF and armasuisse)
Year: 2014

Sense and Avoid

Sens and Avoid Sensors
- Transponder
- ADS B
- TCAS 2
- Flarm
- Electro-optic
- Radar
  (not yet integrated)

Sense and Avoid

Final statement
Switzerland is one of the leading nations in Europe, experienced with UAS-missions in complex airspaces and advanced in research and tests for the new «sense and avoid» technology.

The Swiss governments overall goal is:
- «No negative impact for GA / airports, due to UAV’s capability to detect and avoid all airspace users»
- all cooperative and non-cooperative «targets» in VFR/IFR cond !

This goal is highly appreciated and supported by the FAI
- We are convinced from this philosophy and we think, that this is the right way, and should be the only one way, to the future
- FAI is willing to make this statement to all international regulators, institutions and aeronautical world federations.
- FAI is supporting all national aviation federations to do so and to convince the national governments to follow the same way.

Running steps
1. Each Expert Group had to take out the main issues from this briefing and to finalize the «Exp-Group Reports» to EB and HO
2. Our main interest are UAS which are operating from about 300 ft/ground up to FL 160. For UAS classification, we use international standards and we don’t define FAI-own criterias.
3. Otto Lagarhus will analyse the reports and the UAS-inputs to establish a «FAI Policy-Paper», which can be used:
   - on strategic/international level by FAI President & Executive Directors
   - by all our members for discussions with national authorities
4. A first draft of this «FAI Policy-Paper» was discussed at the Executive Board meeting and Otto Lagarhus will present it to the GC.
5. Each PoC of an EG has prepared a short presentation of the results from Expert Group tasks 2013 in general (UAS was only one issue).

Agenda
- General Overview of the Expert System
- Actual situation of the Expert System and Expert Groups
- Tasks 2013 to the Expert Groups
- «The UAS challenge» – measures taken by FAI
- Planned actions for 2014
- Expert Group results 2013, presented by the PoCs:
4. Planned actions for 2014

**FAI Executive Board / Head Office:**

- Finalise the FAI «Policy Paper»
- Make an official and clear FAI statement to ICAO
- Nominating an FAI representative for ICAO and if possible, also for other in Int. Organisations
- Tasking Expert Groups with new issues
- Appointing new Experts (or exchange) if needed
- Coaching/supporting/monitoring POC’s / Expert Groups
- Information about results to all NAC’s and Commissions

**FAI Expert Groups:**

All Expert Groups had in 2013 also the task, to propose important items as new tasks for 2014 and to study this issues deeper

We are looking forward to the coming presentations of the PoC’s about the reports and their proposed next steps in the Expert Groups

---

**Agenda**

- General Overview of the Expert System
- Actual situation of the Expert System and Expert Groups
- Tasks 2013 to the Expert Groups
- «The UAS challenge» — measures taken by FAI
- Planned actions for 2014

**Expert Group results 2013, presented by the PoC’s:**

- Airspace (AEG) Günter Bertram
- Navigation (NEG) Lars Holmström
- Regulation (REG) Otto Læggaard
- Safety (SEG) Otto Læggaard
- New Technology (NTEG) Visa Matti Leinikki
- IT (ITEG) Visa Matti Leinikki

---

**Thank you for your attention**