



# 107th FAI Annual General Conference

Kuala Lumpur, Malaysia  
4 and 5 October 2013

## Agenda Item 9.3.

### Report Expert System & Expert Groups

Beat Neuenschwander, Executive Director



Agenda # 9.3 – Report on the FAI Expert System and Expert Groups

### Agenda

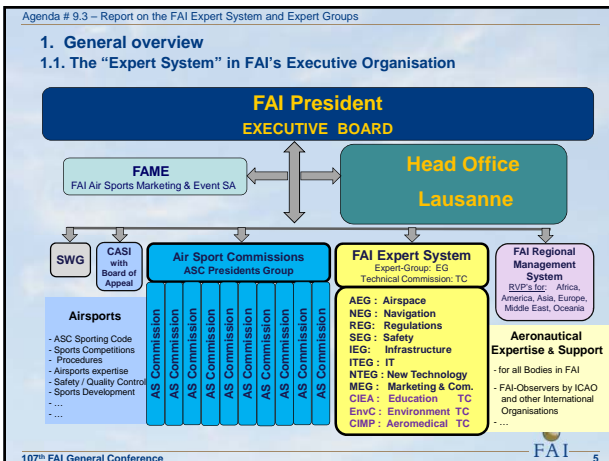
- General Overview of the Expert System
- Actual situation of the Expert System and Expert Groups
- Tasks 2013 to the Expert Groups
- «The UAS challenge» – measures taken by FAI
- Planned actions for 2014
- Expert Group results 2013, presented by the PoC's :
  - Airspace AEG Günther Bertram
  - Navigation NEG Lars Holmström
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  - New Technology NTEG Visa Matti Leinikki
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Agenda # 9.3 – Report on the FAI Expert System and Expert Groups

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Agenda # 9.3 – Report on the FAI Expert System and Expert Groups

### 1. General overview

#### 1.2. The structure for the "FAI Expert System"



**8 Expert Groups**

Airspace	Expert Group	AEG
Navigation	Expert Group	NEG
Safety	Expert Group	SEG
Regulation	Expert Group	REG
Airport Facilities	Expert Group	REG
New Technology	Expert Group	NTEG
IT	Expert Group	ITEG
Marketing and Com.	Expert Group	MCEG

**3 Technical Commissions**

Education	TC	CIEA
Environmental	TC	EnvC
Medico-Physiological	TC	CIMP

**FAI's Aeronaautical 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 airports» by ICAO and other international aviation organisations!



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**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
Airport Facilities	Expert Group	FEG	<i>planned but not yet realised</i>	
Marketing & Com.	Expert Group	MCEG	<i>requirement has to be checked</i>	
3 Technical Commissions				
Medico-Physiological	TC	CIMP		
Education	TC	CIEA	<i>transition in Exp Group ?</i>	
Environmental	TC	EnvC	<i>transition in Exp Group ?</i>	



**2. Actual situation and experiences**

**2.2. Experiences**

**Expert Groups in operation are working well !**

- **Total 40 Experts** from 16 countries ensuring a high-level and wide international spectrum
- **The FAI-EB monitors closely all important activities**
- **EB-directors and Sec.Gen. are supporting specific actions:**
  - Otto Lagarhus (Safety; Regulation)
  - Beat Neuenschwander (Airspace; Navigation)
  - Sec.Gen: Jean-Marc Badan (IT; New Technology)
- Tasking- and reporting processes, deadlines, specific briefings etc
- 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)



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**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 reports/presentations are fixed in the GC- agenda**



### 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 ...**



### 3.1. 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 107<sup>th</sup> Gen Conf



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

- UAS (RPAS) developments in wide areas, UAS-activities worldwide
  - UAS are a challenge for airports / GA = **a challenge for FAI**
  - 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 airports
  - „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 airports / GA**
  - **Cost-driving regulations**
  - **Need of special avionic equipment for other airspace users**
  - **Any compromises in safety**
  - ...



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

**Measures taken by FAI:**

1. **FAI tasked 2013 the Expert Groups «Navigation» and «Airspace»** to analyse this issue and to study existing ICAO and NATO documents (also EASA-, SESAR-, US- etc doc's) and to establish a report with proposals to EB  
The „Expert Group's „Regulation“ and «Safety» are also involved and carefully watching this process.
  2. **Organising a special UAS-briefing for FAI Experts in Switzerland 2013**
  3. **The Executive Board intends to make clear statements to ICAO and other international regulatory institutions, to maintain the flexibility for all airspace-users and to avoid restrictive and cost-driving regulations for GA/recreational-av. and airports.**
- Goal:** **To Establish an «FAI Policy-Paper», which can be used:**
- **on strategic/international level by FAI President & Executive Directors**
  - **by NAC's and Aero-Clubs for discussions with national authorities**
  - **by airport commissions and by all our members**  
(organising meetings, events, competitions, ...)



## UAS-Briefing for FAI Experts

Zurich Airport, sept 3rd 2013



Beat Neuschwander, FAI Executive Director



## Agenda

### Session 1:

- **FAI - Welcome adress** FAI Executive Director
  - FAI's Organisation with Expert System
  - UAS – a challenge for world airports / FAI
- **Swiss Airforce** Swiss Airforce  
Cdr 84<sup>th</sup> UAS Trg Cmd
  - 15 year experiences with UAS-operations
  - Missions in complex civ. / mil. airspaces

### Lunch break

### Session 2:

- **armasuisse** (swiss defence procurement agency) armasuisse  
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 Gouvernement / Departement of Defence:

**SWISS Airforce:** Col Adrian Fischer, Cdr 84<sup>th</sup> UAS-Trg Command  
**armasuisse :** Mr Roland Ledermann, PM Unmanned Aircraft Syst

### FAI-Experts: Participants from 6 Nations:

- Executive Board Director's: Beat Neuenschwander Switzerland (chair)  
Otto Lagarhus Norway
- Expert Group Navigation: Lars Holmström / PoC Sweden  
Henry Leuthold Switzerland
- Expert Group Airspace: Günther Bertram / PoC Germany  
John Brady United Kingdom
- Expert Group Regulation: Philip Bärtschi 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 Zürich  
 Mrs Fiona Lombardi Section Airspace // BAZL NCAA / Nat Civil Aviation Authority  
 Mr Markus Famer 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 also 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 NCAA are fully involved in the process
- The actual Swiss UAS «Ranger» successfully passed several safety assessments, conducted by skyguide.



## Conclusion

- The Swiss Air-Force accomplished more than 4300 missions (7'500 flight hours) with different payloads/sensors in civil-airspace categories **C,D,E and G**

### 25% civil-gouvernement «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)



Schweizerische Eidgenossenschaft  
 Confédération suisse  
 Confederazione Svizzera  
 Confederaziun svizra

## ADS 95 "RANGER"



BDO Kdo 94



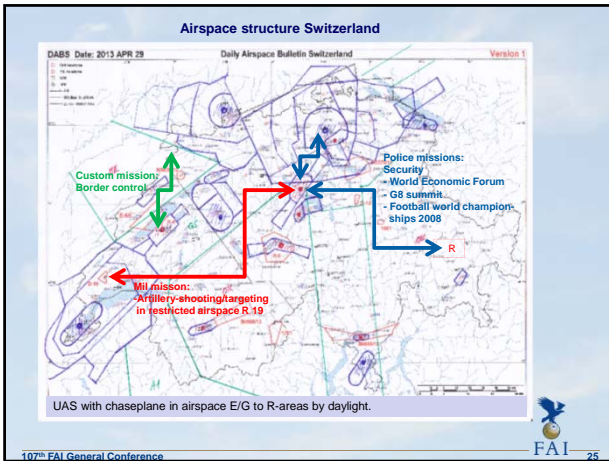
## Conclusion

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







### 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. 2015, op-readiness 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 techn. equipment.

**Goal: No negative impact for GA / airports !**

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### 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 programm and results.

The tests started in summer 2013.


**First phase:**  
Tests with electro-optics sensors and a «sense and avoid» software.

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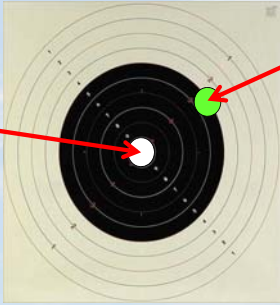



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## Sense & Avoid requirements



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





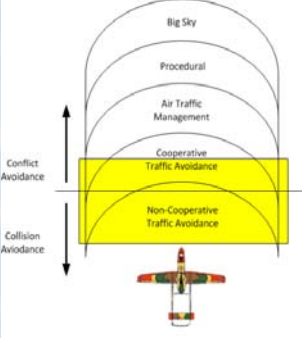
S&A requirements (skyguide, SAF and armasuisse)  
Year: 2014

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## Sense and Avoid



Standard situational awareness for the UAS pilot



**Sense and Avoid**


- Provide additional situational awareness to the UAS pilot
- Warnings and de-conflicting advise to the UAS pilot
- Executing collision avoidance maneuver without any inputs from the UAS pilot

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## Sense and Avoid



### Sense and Avoid Sensors

<ul style="list-style-type: none"> <li>▪ Transponder</li> <li>▪ ADS B</li> <li>▪ TCAS 2</li> <li>▪ Flarm</li> </ul>	}	«cooperative»
<ul style="list-style-type: none"> <li>▪ Electro-optic</li> <li>▪ Radar (not yet integrated)</li> </ul>	}	«non-cooperative»

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## Final statement

Switzerland is one of the leading nations in Europa, 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.

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## Running steps

1. Each Expert Group had to take out the main issues from this briefing and to finalize the «Exp-Group Report» 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).

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#### 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



#### 4. Planned actions for 2014

##### 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



*Thank you for your attention*



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- IT             ITEG      Visa Matti Leinikki

