Realização

DCA-BR Organização Brasileira para o Desenvolvimento da Certificação Aeronáutica

Apoio

ANAC

CAvEx

NOVOTEL

BRVANT

SANTOS LAB

Patrocínio

AEL AEROELETRÔNICA

AGX tecnologia

EMBRAER Defense Systems

eSysTech Embedded Systems Technologies

Gyrofly

KONATUS

PRICE INDUCTION BRASIL

SENTIENT

SOL·EN·TECH

TBX

xmobots

GLOBAL ACCESS INITIATIVE

Federating The International UAS Community

National UAS Conference

Sao José dos Santos, Brazil

27 October 2010

UAS: THE GLOBAL PERSPECTIVE with a Focus on Light UAS

Peter van Blyenburgh

Presentation Overview

Federating The International UAS Community

- Introduction to UVS International
- RPA or UA?
- Terms & Definitions
- Categories & Industrial base
- UAS in service
- Military applications
- Out-of-country deployments
- Governmental non-military applications
- The current problems

28 Slides

- Addressing the problems
- EUROCAE WG73
- ICC
- JARUS
- ICAO

9 Slides

- Survey for the EC on non-military LUAS applications
- EC DG MOVE Hearing on LUAS
- The current LUAS situation
- Conclusions
- Recommendations

23 Slides

Total: 60 Slides

What is UVS International?

Federating The International UAS Community

1997	Non-profit association founded in Paris, France as Euro UVS
1999	EURO UVS is registered in Den Haag, The Netherlands
2004	Changed its name to UVS International – Global Scope
	Operates: Out of offices in Paris, France
2010	263 Corporate & Institutional Members in 34 countries
	111 Honorary Members - 24 countries & 7 international orgs
	Nat. military & CAAs + EASA + EDA + EUROCONTROL + FAA + NATO
www.uvs-info.com	World's largest generic UAS & UGV web site

CAA = Civil Aviation Authority
EDA = European Defence Agency
EASA = European Aviation Safety Agency
FAA = Federal Aviation Administration

Members & Affiliations

✪ = Honorary Mbrs ■ = Corporate Mbrs

Federating The International UAS Community

✪ Argentina	✪ ■ Germany	✪ ■ Portugal
✪ ■ Australia	■ Greece	■ Russian Fed.
■ Austria	✪ Hungary	✪ Singapore
■ Belarus	✪ India	✪ ■ Slovenia
✪ ■ Belgium	■ Indonesia	✪ ■ South Africa
✪ Botswana	■ Israel	✪ ■ South Korea
■ Brazil	✪ ■ Italy	■ Spain
✪ ■ Canada	■ Japan	✪ ■ Sweden
■ China	■ Latvia	✪ ■ Switzerland
✪ ■ Czech Rep.	✪ ■ Luxembourg	■ Turkey
✪ ■ Denmark	✪ ■ Netherlands	✪ ■ UK
✪ ■ Finland	✪ ■ New Zealand	✪ ■ USA
✪ ■ France	✪ ■ Norway	

263 Members
38 Countries
10 International Organizations

Working Groups Instigated by UVSI

- UAV DACH (WG)
- IWGLUAS
- ICC

Partner Organizations

- ADE, India
- Expo-Ecos
- AVBS, Czech Rep.
- European Air Sports Ass.
- Eurosatory (COGES), France
- Intern. Aviation Grp, China
- Japan UAV Association
- RCAPA, USA
- UAS Norway, Norway
- UATAR, Australia
- UAV DACH, Germany (Ass.)
- UAVS, UK
- Unmanned Systems Canada
- UVS France, France
- UVS Korea, S. Korea

Creation instigated/encouraged/supported by UVS International

Member

- EUROCAE WG73 (Standing adviser)
- RTCA SC 203

Participant

- ICAO UAS SG
- EC UAS Conference Org. Committee

Mutual Memberships

- ATCA, USA
- EUGIN, Belgium
- EUROCAE, France
- The European Institute, USA

Board of Directors

12 countries represented

Federating The International UAS Community

Peter van Blyenburgh **Blyenburgh & Co., France** President (1st year - 7th mandate)	Jean Caron **EADS DS, France** Treasurer (1st year - 5th mandate)	Doug Davis **NMSU-PSL, USA** Secretary (1st year – 1st mandate)

Eduardo Carrillo **Boeing R&T Europe Spain** (1st year – 1st mandate)	Ian Glenn **ING Engineering Canada** (1st year – 2nd mandate)	Ole Vidar Homleid **Robot Aviation Norway** (1st year - 1st mandate)	David Kershaw **BAE Systems UK** (1st year – 2nd mandate)
Alexander Koldaev **Irkut Corp. Russian Fed.** (1st year – 2nd mandate)	Simo Makipaja **Patria Finland** (1st year – 1st mandate)	Gérard Mardiné **Sagem D & S France** (1st year – 1st mandate)	Steve May **General Atomics USA** (1st year – 2nd mandate)
Nick Miller **Thales Aerospace UK** (1st year – 4th mandate)	Itai Toren **Elbit Systems Israel** (1st year – 2nd mandate)	Robert Veenhuizen **CybAero Sweden** (1st year – 2nd mandate)	John Walker **The Padina Group USA** (1st year – 3rd mandate)

Observers: Gilles Fartek, Integra, Denmark
Tore Kallevig, Avinor, Norway
Mike Lissone, Eurocontrol, Belgium
Abdoulay N'Diaye, Thales, France

WHAT ARE WE TALKING ABOUT?

Remotely Piloted Aircraft (System)
or
Unmanned Aircraft (System)

Federating The International UAS Community

Europe

AIRCRAFT		
Certified/Approved		**Not Certified** (models)
Civil		**State** (Military & Non-Military)
< 150 kg	**> 150 kg**	
Piloted		**Pilot-less** (tethered objects)
Remote Pilot	**Optional Remote Pilot**	**Onboard Pilot**
Human		**Machine**
Pilot in Command		

REMOTELY PILOTED AIRCRAFT

Purpose-Built Aircraft	Converted Aircraft
Civil	State (Military & Non-Military)

Europe

< 150 kg

> 150 kg

LUAS





UAS




OPA














TERMS & DEFINITIONS – 1/4

Federating The International UAS Community

Produced by the UVS International-instigated Interim Working Group on Light UAS (IWGLUAS)
Submitted to EUROCAE, EUROCONTROL, FAA & ICAO for consideration

Aircraft **ICAO Annex 8**	Any machine that can derive support in the atmosphere from the reaction of the air other than the reaction of the air against the earth's surface.
Unmanned	No person on board capable of exercising any control over the aircraft.
Unmanned aircraft (UA)	An aircraft designed to operate with no person on board capable of exercising any control over the aircraft.
Light Unmanned Aircraft (LUA)	Unmanned aircraft with a mass of less than 150 kg.
Unmanned aircraft system (UAS)	The combination of unmanned aircraft (UA), the system elements necessary to enable the taxiing, take-off/launch, flight and recovery/landing of UA, and required to accomplish its mission objectives.

Non-Recreational Purposes

Acronyms are invariant and refer both to singular & plural.

TERMS & DEFINITIONS – 2/4

Federating The International UAS Community

Produced by the UVS International-instigated Interim Working Group on Light UAS (IWGLUAS)
Submitted to EUROCAE, EUROCONTROL, FAA & ICAO for consideration

Unmanned aircraft system (UAS)

Non-Recreational Purposes

The combination of unmanned aircraft (UA), the system elements necessary to enable the taxiing, take-off/launch, flight and recovery/landing of UA, and required to accomplish its mission objectives.

UAS system elements

- Unmanned aircraft
- Control station(s) / pilot station(s)
- Software
- Health monitoring
- Communication link (s) (command & control + data)
- Data terminal (s) (payload exploitation)
- Payload (s)
- Launch & recovery systems
- Flight termination system (s)
- Support & maintenance equipment
- Power generation, distribution & supply
- Air traffic control communications equipment (voice + data)
- Handling, storage & transport equipment
- All required documentation related to aforementioned

Acronyms are invariant and refer both to singular & plural.

TERMS & DEFINITIONS – 3/4

Federating The International UAS Community

Produced by the UVS International-instigated Interim Working Group on Light UAS (IWGLUAS)
Submitted to EUROCAE, EUROCONTROL, FAA & ICAO for consideration

UAS operator (UAS-o)	The legal entity approved for the operation of a UAS.
UAS crew (UAS-c)	All persons assigned by an Operator to fulfil specific functions relative to correct & safe UAS operation.
UAS commander (UAS-cdr)	The person who has overall authority & responsibility for the safe operation of a UAS during a specific mission. The UAS-cdr may also fulfil the UAS pilot function.
UAS pilot (UAS-p)	The person in direct control of the UA whilst the engine is running and responsible to the UAS-cdr. The UAS-p may have direct control of more than one UA.
UAS crew member (UAS-cm)	A person assigned by the UAS Operator to perform specific duties prior to UA flight, during the operation of the UAS, and after recovery or landing of the UA.

Acronyms are invariant and refer both to singular & plural.

TERMS & DEFINITIONS – 4/4

Federating The International UAS Community

Produced by the UVS International-instigated Interim Working Group on Light UAS (IWGLUAS)
Submitted to EUROCAE, EUROCONTROL, FAA & ICAO for consideration

Automatic	Execution of a predefined process that requires UAS-c initiation.
Communication link	A data link to transfer voice or data between the UAS crew, air traffic control, airspace users and other data users.
Control link	A data link for up-linking command instructions and down-linking status between the UA and the control/pilot station (s).
Data link	A term referring to all interconnections to, from and within the UAS. It includes control, communication, and payload links.
Control station (CS) / Pilot station (PS)	A facility or device (s) from which a UA is controlled for all phases of flight. There may be more than one control station as part of a UAS.
Optionally piloted aircraft (OPA)	Aircraft that may be operated by an onboard pilot or without an onboard pilot.
Payload	All elements of a UA that are not necessary for flight but are carried for the purpose of fulfilling specific mission objectives.

UAS CATEGORIES

		Mass	Range	Flight Alt.	Endurance	
η	Nano	< 0,025 kg	< 1 km	100 m	< 1 hour	
μ	Micro	< 5	< 10	250	1	
Mini	Mini	< 20/25/30/150◆	< 10	150 m ◆	< 2	
CR	Close Range	25-150	10 - 30	3.000	2 – 4	
SR	Short Range	50-250	30 - 70	3.000	3 - 6	
MR	Medium Range	150-500	70 - 200	5.000	6 - 10	◆
MRE	MR Endurance	500-1500	> 500	8.000	10 - 18	◆
LADP	Low Alt. Deep Penetration	250-2500	> 250	50 - 9.000	0,5 - 1	
LALE	Low Alt. Long Endurance	15-25	> 500	3.000	> 24	
MALE	Medium Alt. Long Endur.	1000-1500	> 500	5/8.000	24 - 48	◆◆
HALE	High Alt. Long Endurance	2500-5000	> 2000	20.000	24 - 48	
Strato	Stratospheric	>2500	> 2000	> 20.000	> 48	
EXO	Exo-stratospheric	TBD	TBD	> 30.500	TBD	
UCAV	Unmanned combat AV	>1000	+/- 1500	12.000	+/- 2	◆
LET	Lethal	TBD	300	4.000	3 - 4	◆
DEC	Decoys	150-500	0 - 500	50 - 5.000	< 4	◆
TGT	Aerial Targets	10-10.000	5 – 200	50 – 10.000	> 0,5	◆

◆ = According to national legal restrictions

◆ = Can currently be armed
◆ = Capable of carrying ordnance
◆ = Expendable

International UAS Activity

Federating The International UAS Community

2010 = 1247 Systems - 500 Producers - 54 Countries

	✪	■	■	■
Algeria	✪			
Argentina	✪	■	■	
Australia	✪	■	■	
❖Austria		■	■	
Bahrain	✪			
Belarus	✪	■	■	
❖Belgium	✪	■	■	
Botswana	✪			
Brazil			■	■
❖Bulgaria	✪	■	■	
Canada	✪	■	■	
Chile		■	■	
China (PR)	✪	■	■	
Colombia	✪		■	■
❖Croatia			■	■
❖Czech Rep.	✪	■	■	
Egypt	✪			
Equator		■	■	
❖Finland	✪	■	■	
❖France	✪	■	■	
❖Germany	✪	■	■	
❖Greece	✪	■	■	
❖Hungary	✪	■	■	
India	✪	■	■	
Indonesia	✪		■	■
Iran	✪	■	■	
Israel	✪	■	■	
❖Italy	✪	■	■	
Japan	✪	■	■	
Jordan	✪	■	■	
Malaysia	✪	■	■	
Mexico	✪	■	■	
❖Netherlands	✪	■	■	
New Zealand		■	■	
❖Norway		■	■	
Pakistan	✪	■	■	
Philippines	✪		■	
❖Poland	✪	■	■	
❖Portugal			■	■
Qatar	✪			
❖Romania	✪	■	■	
Russia	✪	■	■	
❖Serbia		■	■	
Singapore	✪	■	■	
❖Slovakia		■	■	
❖Slovenia		■	■	
South Africa	✪	■	■	
South Korea	✪	■	■	
❖Spain	✪	■	■	
Sri Lanka	✪		■	■
❖Sweden	✪	■	■	
❖Switzerland	✪	■	■	
Syria	✪			
Taiwan	✪	■	■	
Thailand	✪		■	■
Tunisia			■	■
Turkey	✪	■	■	
UAE	✪	■	■	
❖UK	✪	■	■	
Ukraine	✪	■	■	
USA	✪	■	■	

✪ = UAS in Inventory		■ = Producing Countries		■ = Ongoing R&D		■ = Future Producers?	
World total	49	World total	44	World total	54	World total	9
Europe	16	Europe	23	Europe	22	Europe	2

UAS Categories (I)

Non-Recreational Purposes

Federating The International UAS Community

Nano

Micro

ProxDynamics, Norway
Hornet 1 – 15 grams

TU Delft, Netherlands
Delfly – 3 grams

NRL, USA
Mite

AeroVironment, USA
Wasp I

Miraterra, USA
DragonSlayer

Mini

Sirehna –DCNS), France
Elsa

SurveyCopter, France
Copter 1

EADS DS & SurveyCopter, France - ***Tracker (DRAC)***

Elbit Systems, Israel
SkyLark I

Mini (Lighter-Than-Air)

PixScene, France
Airstar

Skive Aviation, Switzerland
Skive

Gates Technologies, France
GT AirCat
(no longer in production)

UAS Categories (II)

Non-Recreational Purposes

Federating The International UAS Community

Yamaha, Japan
RMax II

EMT, Germany
Luna

Schiebel, Austria
Camcopter

CybAero, Sweden
CR

Close Range (CR)

Elbit Systems Israel
SkyLark II

Singapore Technologies, Singapore
SkyBlade II

Adv. Ceramics Research (BAE Systems), USA ***Silver Fox***

ATE, South Africa
Vulture MK II

Schiebel, Austria
S-100

VTUL a PVO, Czech Rep
Sojka III

Aerovision, Spain - ***Fulmar***

Short Range (SR)

UAS Categories (III)

Non-Recreational Purposes

Federating The International UAS Community

Aurora FS, USA
GoldenEye 50

BAE Systems, UK
Phoenix

Yakovlev, Russia
Pchela

Sagem, France
Crecerelle

Short Range (SR)

AAI Corp., USA
Shadow 200

Sagem, France
Sperwer

RUAG, Switzerland
Ranger

Northrop Grumman, USA
FireScout

Medium Range (MR)

EADS DS, France
Orka

Rheinmetall Defence, Germany
KZO

IAI-Malat Div., Israel & Northrop Grumman, USA
Hunter

Bell Helicopter, USA
Eagle Eye

UAS Categories (IV)

Federating The International UAS Community

Non-Recreational Purposes

U-Tacs (Thales, UK & Elbit Systems), Israel
Watchkeeper

Sagem, France
Sperwer B

IAI-Malat Div., Israel
E-Hunter

Denel Aerospace, S.Africa
Seeker II

Selex Galileo, Italy
Falco

AAI Corp, USA
Shadow 600

Medium Range Endurance (MRE)

EADS DS, France &
Galileo Avionica, Italy
Carapas

EADS DS, France &
EADS DE, Germany
CL289

Selex Galileo
Italy
Nibbio

Low Altitude Deep Penetration (LADP)

UAS Categories (V)

Non-Recreational Purposes

Federating The International UAS Community

Boeing & InSitu Group, USA
ScanEagle

Aerosonde (AAI), Australia
Aerosonde Mk III

Boeing & Insitu, USA
Integrator

Low Altitude Long Endurance (LALE)

General Atomics AS, USA
Predator A

EADS DS, France
Eagle 1

Elbit Systems, Israel
Hermes 1500

Boeing, USA
A-160 Hummingbird

Denel Aerospace, South Africa
Bateleur

IAI-Malat Div., , Israel
Heron TP

Medium Altitude Long Endurance (MALE)

UAS Categories (VI)

Non-Recreational Purposes

Federating The International UAS Community

Medium Altitude Long Endurance (MALE)

BAE Systems, UK
Mantis

General Atomics AS, USA
Avenger

Elbit Systems, Israel
Hermes 900

General Atomics AS, USA
Predator B

EADS Military Aircraft Systems
France + Germany + Spain
Talarion

AeroVironment, USA
Global Observer

UAS Categories (VII)

Non-Recreational Purposes

Federating The International UAS Community

High Altitude Long Endurance (HALE)

Stratospheric Long Endurance (STRA LE)

Aurora Flight Sciences, USA
Odysseus

EuroHawk GmbH, Germany
(EADS MAS, Germany &
Northrop Grumman, USA)
EuroHawk

UAS Categories (VIII)

Non-Recreational Purposes

Federating The International UAS Community

BAE Systems, UK
Corax

EADS MAS, Germany
Barracuda

Saab, Sweden
Sharc

Selex Alenia, Italy
Sky-X

Dassault, France + Euro consortium
Neuron

Unmanned Combat Aerial Vehicle (UCAV)

Boeing, USA
X-45A

Northrop Grumman, USA
X-47B

Boeing, USA
X-46

Northrop Grumman, USA
X-47A

UAS Categories (IX)

Non-Recreational Purposes

Federating The International UAS Community

EADS DS + Sirehna & Sinovia (Dyn'Aero), France
MCRISurveyor 2500

Boeing, USA
LittleBird

Aurora FS, USA - Aeronautics, Israel - Rheinmetall Defence, Germany (Diamond, Austria)

Irkut, Russia (Stemme, Germany)
Irkut 850

Excelnet, Malaysia
Eagle

Optionally Piloted Aircraft (OPA)

Sagem D&S, France (Stemme, Germany)
Patroller

BAE Systems, UK (J&AS Aero Design, Poland)
Herti 1A

Herti 1D

Converted Manned Aircraft

Model Aircraft

RECREATIONAL Purposes

Federating The International UAS Community

Toys

Model Aircraft (<20-25 kg & >20/25 & <150kg)

Very Large Model Aircraft (> 150 kg)

Military UAS in Service in per Country (Europe & USA)

Federating The International UAS Community

	LUAS	UAS	Total
Albania			
Austria			
Belgium		1	1
Bosnia			
Bulgaria		1	1
Croatia			
Cyprus			
Czech Rep.		1	1
Denmark		1✝	
Estonia			
Finland	1	1	2
France	2	3	5
Germany	1	2 + 2*	5
Greece		1	1
Hungary	1		1
Ireland		1	1
Italy	1	3	4
Latvia			
Lithuania			
Luxembourg			
Malta			
Macedonia			
Montenegro			
Netherlands	2	2	4
Norway			
Poland	1	1*	2
Portugal			
Romania		1	1
Serbia			
Slovakia			
Slovenia	1*		1
Spain		1 + 1*	2
Sweden		1	1
Switzerland		1	1
UK	1	3 + 1*	5
USA	18	14	32

		Europe	USA
Nr Systems	Light UAS (<150 kg)	11	18
	UAS (> 150 kg)	28	14
Total		39	32

No UAS in service
* = On order
✝ = Terminated

Military Applications

Federating The International UAS Community

CURRENT

- Command & Control Relay
- Decoy
- Battle Damage Assessment
- Psychological Warfare
- Reconnaissance
- Surveillance
- Target Designation
- Treaty Monitoring
- Weapons Delivery

FUTURE

- Aerial Mine Detection
- Artillery Correction
- Battle Management
- Comms & Data Relay
- Digital Mapping
- Electronic Warfare
- Flight Path Recce
- NRBC Recce
- Perimeter Surveillance
- Radar Jamming
- Radar Saturation
- Sensor Delivery
- SIGINT
- Urban Warfare
- Offensive Missions:
  - -anti-radar
  - -anti-vehicle
  - -anti-ship
  - -anti-structure
- Maritime Surveillance

DRIVERS:
- Dangerous missions -> No risk to pilot
- Lesser political risks
- Information = Power & Permits Precision Strike
- Cost-Effectiveness in relation to manned A/C

Out-of-Country Military Deployments

Bosnia ’93-’96

France	Crecerelle
UN	Fox AT
USA	Gnat 750
	Pioneer
	Predator

Kosovo ’98-’99

France	CL-289
	Crecerelle
	Hunter
Germany	CL-289
UK	Phoenix
USA	Hunter
	Pioneer
	Predator

Kosovo ’05

Belgium	Hunter

Australia ’01 +++

USA	Global Hawk

Djibouti/Yemen ’02

USA	Predator

East Timor ’02

Australia	Aerosonde III

Solomon Islands ’03

Australia	Aerosonde III
	Avatar

Afghanistan ’01-now

Australia	Scan Eagle
Canada	Sperwer SkyLark
	Heron ScanEagle
France	Harfung DRAC
	Skorpio Sperwer
Germany	Aladin KZO
	LUNA
Italy	Predator A
Netherlands	Aladin SkyLark
	Sperwer
U.A.E.	In-country-built UAS
UK	Desert Hawk
	Hermes 450
	Herti
	Predator B
USA	Dragon Eye
	Global Hawk
	Pointer
	Predator A & B
	Raven Reaper
	Shadow 200

South Korea ’03

USA	Shadow 200

Angola ’03 - now

IL Serv. Supplier	Aerostar

Ivory Coast ’04

IL Serv. Supplier	Aerostar

Dem. Rep. of Congo ’06

Belgium	Hunter

Ivory Coast ’06

France	Skorpio

Iraq ’03 -now

Australia	Scan Eagle
	SkyLark
Italy	Predator A
Japan	RMax
Romania	Shadow 600
UK	Desert Hawk
	Hermes 450
	Phoenix
USA	Desert Hawk
	Dragon Eye
	Global Hawk
	I.Gnat
	Hunter
	MAV
	Pioneer
	Predator A & B
	Puma
	Raven A & B
	Scan Eagle
	Shadow 200
	Silver Fox
	Snow Goose
	Tern
	Wasp

Haïti - USA

Global Hawk
ScanEagle

Seychelles

Predator A

Somali Coast

ScanEagle

Lebanon ’06

France	Sperwer (NU)

Kosovo ‘07

France	Sperwer

Chad ’08

France	SkyLark I
	CL289

Potential
Governmental Non-Military UAS Applications

Customs Authorities
- Coastal patrol
- On-shore border patrol
- EU maritime surveillance
- EU on-shore border patrol

Civil Security
- Avalanche survivor search
- Coastal water surveillance
- Maritime search & rescue

EU Civil Security
- Maritime surveillance

Regional Fire Brigade
- Forest fire surveillance

National Fire Brigade
- Forest fire surveillance
- Natural disaster monitoring

USEP Study Results

Civil Security & National Police
- Contamination measurement
- Systematic search ops
- Natural disaster monitoring
- Emergency medical/food supply

Police Authorities
- Information gathering (in buildings)
- Special ops, anti-terrorist
- Urban law enforcement
- Pre-intervention info gathering
- Urban riot control
- Perimeter defence
- Hostile protest control
- Criminal investigation (several days)
- Surveillance of public gatherings
- Road traffic surveillance
- Delivery of non-lethal disabling means
- Coastal border immigration control
- Ship lane surveillance
- Permanent police surveillance
- Land border immigration control
- Maritime immigration control
- EU land border immigration control

Environmental
- Local science missions
- Atmospheric measurements
- Wild game surveillance
- Fishery control
- Ozone measurements
- Weather assessment
- Crop monitoring
- Sandbank shift measurement
- Glacier & ice cap monitoring

Contractor Supplied Flight Services
- Training
- Terrain mapping
- Aerial photography
- Monument inspection
- Network comms relay (small theatre)
- Network comms relay (large theatre)
- Emergency comms network

The seeds of a totally new service industry

WHAT ARE THE PROBLEMS?

Federating The International UAS Community

Most military UAS are still "user specific"
High development costs + low volume production =
High acquisition cost & high ownership cost

Military UAS are too expensive to transition to non-military applications

No standards — No airworthiness norm
No certification norms — No ATM regulations
Involved communities do not speak the same language

<u>The Critical Issues</u> :

- Sense & Avoid
- Spectrum & Bandwidth
- Security
- Insufficient R&D funding

Flight in non-segregated airspace is impossible

<u>Result</u> : The markets for the following 3 sectors cannot emerge:
- non-military governmental - scientific - commercial

This Is NOT The Solution !

Federating The International UAS Community

WHAT SHOULD BEEN DONE ?

Federating The International UAS Community

♦ INDUSTRY SHOULD BE THE DYNAMO

- ♦ National approaches with cooperation between:
  - Industry - Gvmt Authorities - Stakeholder Orgs - Academia
- ♦ National efforts [civil & military] in Europe & USA should be coordinated to form a harmonized approach (in cooperation with ICAO, EC, EASA, EDA, Eurocontrol, FAA, NATO)
- ♦ European & USA efforts to be coordinated internationally (beyond Europe & USA) with: Australia, Brazil, Canada, China, India, Japan, N.Zealand, Russia, Singapore, South Africa, South Korea, UAE
- ♦ International approaches to be harmonized at earliest possible stage
- ♦ Standards (functional requirements) to be consensually defined with implication of the national CAAs & Air Navigation Service Providers
- ♦ A common terminology in English should be defined

International Civil Aviation Organization (ICAO) should be engaged

EUROCAE WG73 on UAS

UAS MTOM > 150 kg – EASA Rules

Participation	International industry & regulatory authorities Participation is funded by the participants
	3-4 annual plenary meetings of 2 to 3 days each
	Participation open to all from all countries
Activities	Coordinated with EASA & RTCA
Chair	Tore Kallevig, Avinor, Norway
Sub-Groups	1 UAS Operations & Sense & Avoid (>150kg) 2 Airworthiness & Continued Airworthiness (>150kg) 3 Command & Control, Communication & Spectrum 4 Light UAS (MTOM < 150kg) & VLOS Operations
Objective	Creation of UAS-related standards & guidance material for submission to EASA & national aviation authorities for consideration

EUROCAE WG73 on UAS

SG4 on LUAS (MTOM < 150 kg)

LUAS Responsibility : National CAAs

OBJECTIVE

Create a guidance document around which to bring the European CAAs together & propose a harmonized approach to the operation of LUAS.

A "sanitized & adapted" version of the latest update of UK CAA's CAP722 has been reviewed & commented on by ICC participants. Consolidation of the comments has taken place.

The consolidated document has been reviewed by the members of EUROCAE WG73

The final guidance document will be submitted to the EUROCAE Council for approval

Hereafter, the final guidance document will be made available to all European & non-European CAAs, as well as other interested parties.

NOTES

The start-up of a separate EUROCAE WG on LUAS is being considered

The "Minimal Risk" LUAS (< 2 kg) initiative has been launched

JARUS

Joint Authorities for Rulemaking on UAS

International coordination group initiated & chaired by CAA The Netherlands

Objective Definition of a common and harmonised set of airworthiness, operational and airspace requirements for Light UAS.

CAA Participants	Observers	Coordinated With	Feeds Inputs To
1 Australia 2 Austria 3 Belgium 4 Brazil 5 Canada 6 Czech Rep. 7 France 8 Germany 9 Italy 10 Malta 11 Netherlands 12 Norway 13 South Africa 14 Spain 15 Switzerland 16 UK	EASA EUROCONTROL	Transport Canada FAA, USA	ICAO EASA Eurocontrol Eurocae WG73

Deliverable

A single set of draft airworthiness, operational & airspace requirements, accepted by participating countries.
These draft requirements will be available to industry and other UAS stakeholders for consultation.

Outreach All European & non-European CAAs can join

JARUS

Joint Authorities for Rulemaking on UAS

Delivered

- JARUS UAS-FCL: Draft proposal for UAS Flight Crew Licence
- JARUS CS-LURS: Draft proposal for technical certification requirements for Light unmanned rotorcraft (<600 kg)
- JARUS System Safety Proposal CS-LURS.1309: Draft proposal for technical system safety requirements

These documents will be finalised within EUROCAE WG 73

Upcoming

- JARUS UAS OPS: Draft proposal for UAS Operator requirements
- JARUS CS-LUAS: Draft proposal for LUAS technical certification requirements (<150 kg) (fixed wing)

International Civil Aviation Org.

27 Jun 2005	ICAO issues a State letter + questionnaire regarding UAS. Sent to 43 States & 9 international organizations.
23 & 24 May '05	- ICAO exploratory meeting on UAS; - Invitees: States & internat. orgs having replied to State letter.
Conclusions	- ICAO to coordinate development of a strategic document to be used as the basis for development of regulations. - Informal "core group" formed to develop guidance document. - Request for ICAO UAS focal point to be evaluated by ICAO.
Core Group	CAA, UK ENAC, Italy Eurocontrol, Europe FAA, USA Min. of Transport, Germany RTCA, USA Transport Canada UVS International
9 Jan 2007	Draft guidance document submitted to ICAO
April 2007	Draft guidance document presented to ICAO Council ICAO Council approves start-up of ICAO UAS Study Group
Aug 2007	ICAO State letter announces creation of official UAS SG

International Civil Aviation Org.

ICAO UAS Study Group

Participation:

EUROPEAN COMMISSION - DG Mobility & Transport

16 STATES

CAAs of: Australia, Austria, Brazil, Canada, China, Czech Rep., France, Germany, Italy, Netherlands, Russian Fed., Singapore, South Africa, Sweden, UK, USA

9 INTERNATIONAL ORGANIZATIONS

CANSO, EASA, EUROCAE, EUROCONTROL, IAOPA, ICCAIA, IFALPA, IFATCA, UVS International

1st Deliverable In 2010

UAS Circular providing an overview of UAS activities incl. extensive background information for use by States in developing their regulatory frameworks.
The circular will also assist industry to understand what goals to aim for & what performance-based Standards And Recommended Practices (SARPs) are to be anticipated in the future.
A preliminary list of terms & explanations is included.

International Civil Aviation Org.

Global ATM Forum On Civil/Military Cooperation - ICAO HQs - 19-21 Oct '09

Historic Event

1st Civil/Military event organised by & taking place at ICAO
1st time UAS are an official agenda item at an ICAO Plenary Meeting

Participation

433 Delegates - 216 State repr. (civil & military), 46 international orgs (incl. UVS International), 38 industry repr., 28 ICAO repr., 10 ANSPs, 50 exhibitor repr.

Conclusions

ICAO, States, Military Authorities & Partners will endeavour to work together for mutual benefit:

- use ICAO as an open forum for civil/military cooperation, collaboration & sharing of best practices;
- develop a new ICAO manual on civil/military cooperation;
- disseminate ICAO State letter to advise States & international orgs of the C/M Forum and the follow-up actions;
- Cooperation toward assuring safe & efficient integration of UAS into non-segregated airspace;
- Cooperation on ATM security issues;
- ICAO will propose agenda item to be included on the agenda of the 37th Session of ICAO Assembly addressing Civil/Military cooperation;
- ICAO will ensure that momentum gained is strengthened at high levels in State administrations & international orgs;
- Assembly working paper will propose an amendment to Assembly Resolution A36-13 Appendix O, Coordination of Civil and Military Air Traffic, aimed at strengthening States' commitments to enhance cooperation between civil & military authorities.

Survey on LUAS Applications For European Commission

Non-Military Applications for Light UAS

EC Request

In June 2009, the European Commission DG TREN requested UVS International to conduct this fast track non-funded world-wide survey

Participation

120 Organizations from 27 countries

Australia	Austria	Belgium	Brazil	Canada	Cyprus	Czech Rep.
France	Germany	Greece	India	Israel	Italy	Netherlands
Norway	Pakistan	Portugal	Romania	Russia	S. Africa	Spain
Sweden	Switzerland	Taiwan	Turkey	UK	USA	

16 European countries

11 non-European countries

And:

- 3 International associations
- 1 International regulatory working group (JARUS) including :
  - 15 national CAAs + FAA + EASA + Eurocontrol
- 2 Multi-national working groups (INOUI & UAV-DACH)

Survey Presentation & Remittance

At the European Commission's Hearing on Light UAS in Brussels, Belgium on 8 Oct 2009

Survey on LUAS Applications For European Commission

Non-Military Applications for Light UAS

Inputs Received from 120 Organizations

Australia	6	incl. 1 national ass. & 1 national WG
Austria	2	
Belgium	4	
Brazil	2	
Canada	6	
Cyprus	1	
Czech Rep.	3	incl. 1 national ass.
France	13	incl. 1 national ass.
Germany	5	
Greece	1	
India	2	
Israel	1	
Italy	3	
Netherlands	3	
Norway	6	incl. 1 national ass.

Quantity of Contributors per Country

Pakistan	1	
Portugal	1	
Romania	1	
Russia	1	
S. Africa	2	
Spain	10	
Sweden	3	
Switzerland	5	
Taiwan	1	
Turkey	2	
UK	11	incl. 2 national ass.
USA	18	
International Associations		3
International Regulatory WG		1
Multi-National WG		2

11 Non-European countries

Survey on LUAS Applications For European Commission

Non-Military Applications for Light UAS

Breakdown of Contributors By Stakeholder Category

Abbreviation	Stakeholder Category	Qnty
FSP	Flight Service Provider	23
FCS	Flight Service Customer	1
Gvt	Governmental Entity	13
Gvt Research	Governmental Research	5
Gvt Operator	Governmental Operator	8
Industry	Company > SME	16
Ass. Internat.	International Association	3
Ass. Nat.	National Association	6
RA	Regulatory Authority	17
RSP	Regulatory Service Provider	1
Research	Research Organization	18
SME	Small & Medium-Sized Enterprise	69
Stan. Org.	Standards Organization	1
UAS T&E	UAS Test & Evaluation	4
Uni	University	11
WG Multi-Nat.	Multi-National Working Group	2
WG Nat.	National Working Group	1

Flight Service Provider:
Non-governmental UAS operator conducting aerial work

Industry:
Personnel: > 250
Turnover: > 50 million Euro

Operator:
Legal entity deploying the UAS

SME:
Personnel: < 250
Turnover: < 50 million Euro

Note:
Contributors can fall into more than one stakeholder category

Survey on LUAS Applications For European Commission

Non-Military Applications for Light UAS

Inputs Received from 120 Organizations

139 Completed Application Matrixes

Australia	3
Austria	3
Belgium	4
Brazil	2
Canada	6
Cyprus	1
Czech Rep.	1
France	11
Germany	9
Greece	1
India	2
Israel	1
Italy	7
Netherlands	11
Norway	5

Pakistan	1
Portugal	1
Romania	2
Russia	2
S. Africa	5
Spain	21
Sweden	2
Switzerland	5
Taiwan	1
Turkey	3
UK	7
USA	21
International Associations	NA
International Regulatory WG	NA
Multi-National WG	1

11 Non-European countries

Survey on LUAS Applications For European Commission

Non-Military Applications for Light UAS

Types of Aircraft Involved

	APPLICATIONS	
	Current	Desired
Fixed Wing	**57**	**31**
Rotary Wing	**49**	**33**
- single rotor, not shrouded	13	10
- single rotor, shrouded	5	5
- bi-rotor	16	6
- tri-rotor	2	1
- quadri-rotor	12	11
- hexa-rotor	1	
Flexible Wing	**7**	**5**
Motorized Para-Foil	**3**	**2**
Lighter-than-Air	**6**	**5**

Survey on Non-Military Applications for Light UAS – The European Situation

176 Euro LUAS Producers/Developers

SMEs		117
- Producing LUAS	104	
- Producing UAS	13	
Gvmt Research Entities		5
- Producing LUAS	4	
- Producing UAS	1	
Industry		24
- Producing LUAS	12	
- Producing UAS	12	
National Consortia		10
- Producing LUAS	4	
- Producing UAS	6	
Inter-European Cooperation		12
- Producing LUAS	8	
- Producing UAS	4	
International Cooperation		8
- Producing LUAS	0	
- Producing UAS	8	

	SME	Industry
Personnel:	< 250	> 250
Turnover:	< 50 million Euro	> 50 million Euro

313 UAS Produced/Developed

Light UAS (<150 kg)		252	80,5%
-SMEs	208		
-Gmvt Research Entities	7		
-Industry	21		
-National Consortia	8		
-European Cooperation	8		
-International Consortia	0		
UAS (>150 kg)		61	19,5%
-SMEs	17		
-Gvmt Research Entities	0		
-Industry	23		
-National Consortia	8		
-European Cooperation	4		
-International Coop.	9		

252 LUAS Referenced by MTOM

MTOM	Qnty	Percentage
< 1,5 kg	41	16,3%
1,5 – 8 kg	69	27,4%
8 – 25 kg	64	25,4%
25 – 150 kg	78	30,1%

Survey on LUAS Applications For European Commission

Quantity of UAS & LUAS Models Produced in Europe & USA

	LUAS	UAS	Total
Austria	3	2	5
Belgium	2		2
Bulgaria	2		2
Croatia	1	1	2
Czech Rep	2	1	3
Finland	1		1
France	51	6	57
Germany	29	7	36
Greece	3	1	4
Italy	26	9	35
Netherlands	15	1	16
Norway	14	1	15

	LUAS	UAS	Total
Poland	5		5
Serbia	4		4
Slovakia	1		
Slovenia	3		3
Spain	22	3	25
Sweden	4	4	8
Switzerland	15		15
UK	44	12	45
European Coop.	8	5	13
Internat. Coop.		9	

European Total	Light UAS	252	**Total 313**
	UAS	61	
USA Total	Light UAS	203	**Total 341**
	UAS	138	

Survey on Non-Military Applications for Light UAS (LUAS)

CURRENT Non-Military LUAS Applications - Worldwide

SCIENTIFIC & RESEARCH

- Aerial photogrammetry (BE,CH,DE,NL)
- Agricultural monitoring (ES, UK, US)
- Arctic research (DE, NO, UK, US)
- ATM Research (DE, ES)
- Climate monitoring (NO)
- Coastal mapping (NL)
- Coastal zone studies (NL)
- Crop monitoring (US)
- Forestry management/research (SE)
- Geophysical survey (BR)
- Glacier & ice cap monitoring (DK, NO)
- Iceberg monitoring (NO)
- Invasive species identification/analysis (US)
- Marine mammal monitoring (US)
- Meteorological research (DE, NO, US)
- Ocean & sea research support (NO)
- Plant growth vigour mapping (US)
- Salt water infiltration detection (NL)
- Thermal imaging of buildings (heat wastage)
- Vegetation identification (US)
- Volcano monitoring (JP)
- UAS sensor research (CA, (DE,ES,FR,NO,US)
- Wildlife census (ES, US)

SECURITY-RELATED

- Border surveillance (IL, US)
- Crowd surveillance (CH, CN, FR, ZA)
- (Forest) Fire fighting support (ES, HU, UK, US)
- International summit surveillance (CA, FR)
- Maritime & Sea lane surveillance (BE, ES)
- Natural disaster site surveillance (CN,HT, IN, RU, US)
- Police applications (CA, DE, FR, NL, UK, ZA)
- Regional surveillance (Gasa & Occupied Territories)
- Road traffic surveillance (CH)
- Experimentation (AT, AU, BE, CA, CH, CN, CZ, DE, ES, FR, IT, MY, NL, NO, SG, PT, SE, SI, ZA, UK)

CONTRACTOR SUPPLIED AERIAL WORK

- Advertising (light-than-air UAS) (indoor & outdoor)
- Aerial data collection (AU,AT,BE,CH,ES,IT,NL,SE,UK)
- Aerial photography & video (many countries)
- Agricultural fertilizer dispensing (CN, JP, KR)
- Agricultural insecticide spraying (CN, JP, KR)
- Cinema (aerial shots & special effects)
- Critical infrastructure inspection (FR, NL)
- Forest fire operations support (ES, US)
- Historical monument inspection (FR)
- Illegal cannabis cultivation detection (NL)
- Magnetic field survey (AU)
- Oil & gas pipeline monitoring (RU)
- Terrain mapping (BE, DE, NL)

Survey on LUAS Applications For European Commission

Non-Military Applications for Light UAS

UVS International's Recommendations

European LUAS-Related REGULATORY MATTERS

♦ LUAS INDUSTRY (Products & Services) = PRINCIPALLY SMEs

- **LUAS should be the EC's number 1 priority – LUAS are here NOW**
- **European CAAs should agree on a common approach to LUAS through JARUS**
- **National LUAS positions/visions should be created through co-operation between:**
  - **Industry (producers & services)**
  - **CAAs**
  - **Air Navigation Service Suppliers**
  - **Government Authorities**
  - **Academia**
  - **Other Stakeholder Orgs**
- **National associations & Working Groups & Centres of Competence to be used to organize national inputs within the framework of the International UAS Coordination Council**
- **European standards (functional requirements) for LUAS should be rapidly & consensually defined in EUROCAE, in coordination with NATO & EUROCAE WG73**
- **Traditionally not recognized UAS stakeholders (model aircraft community) should be involved**
- **EUROCAE should federate SMEs & other stakeholders in a separate WG with a work methodology geared specifically to SMEs**
- **Common terminology in English to be defined (in co-ordination with EUROCAE WG73 & ICAO)**
- **LUAS community should be recognized by the EC as a separate stakeholder**

Survey on LUAS Applications For European Commission

Non-Military Applications for Light UAS

UVS International's Recommendations

European UAS-Related INDUSTRIAL & R&D MATTERS

- Political awareness of UAS & LUAS-related technologies & their potential should be created
- Unmanned system-related technologies (air, ground, naval, space) should be recognized by the EC as being of strategic importance for Europe
- In this context, the importance & dynamic force of SMEs should be recognized by the EC
- Definition of requirements for R&D, studies, and technology demonstrations should be better coordinated amongst all EC DGs & EC agencies in order to avoid duplication
- Increased funding is required for LUAS R&D, study contracts & technology demonstrations
- Development of S&A systems for certain categories of LUAS should be funded by the EC
- EASA should be given the financial & personnel means of their responsibilities & ambitions
- The access of the LUAS community to EC-funded study results should be improved
- Number of European technology demonstrations should be increased
- Public awareness of unmanned systems & their societal benefits should be improved

EUROPEAN COMMISSION

DG MOVE Hearing on Light UAS – Brussels, Belgium – 8 Oct 2009

Historic Event	**1st European Commission Hearing on UAS**
Participation	**49 European LUAS community stakeholder representatives (industry & gvmt)**
Objective	**Present the conclusions of the survey on non-military applications for LUAS** **Create awareness with the EC on:** **- The ongoing non-military LUAS activities in Europe (governmental non-military, research, commercial);** **- Most current non-military UAS activities in Europe concern LUAS;** **Give the LUAS community the opportunity to voice their opinion on the existing problems;** **Give the LUAS community the opportunity to propose actions for consideration by the EC to resolve the current problems.**
Conclusion	**The EC's Hearing conclusions are published in the 2010 UAS Yearbook**

EC 1st UAS Conference – Brussels, Belgium – 1 July 2010

EUROPEAN REGULATORS

Federating The International UAS Community

EASA – European Aviation Safety Agency

31 Member States

Austria, Belgium, Bulgaria, Cyprus, Czech Rep., Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Rep., Slovenia, Spain, Sweden, Switzerland, United Kingdom

EUROCONTROL – European Organization for the Safety of Air Navigation

38 Member States

Albania, Armenia, Austria, Belgium, Bosnia & Herzegovina, Bulgaria, Croatia, Cyprus, Czech Rep., Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, former Yugoslav Rep. of Macedonia, Turkey, Ukraine, United Kingdom

Regulators currently involved with UAS regulations

SE & UK CAAs have published new UAS regulations; DGAC is in the process of doing so; CZ CAA has produced a draft proposal for a national UAS regulation.

ICC

International Coordination Council

International advisory working group initiated by UVS International

Objective

Within the framework of UVS International's Global Access Initiative:

- **Contribute to increasing international awareness of UAS-related matters;**
- **Give national & multi-national working groups the possibility to make their voice heard globally;**
- **Increase the dual-directional flow of information in all regulatory matters between all ICC members;**
- **Be instrumental to organize and supply national inputs to international working groups, or other UAS-related international efforts;**
- **Contribute to standards work within EUROCAE WG73 SG4 on Light UAS.**

Current Participants

European Air Sports	Korea UVS, S. Korea	RCAPA, USA
UAS Norway	UATAR, Australia	UAV-DACH, Germany
UAVS, UK	Unmanned Systems Canada	UVS France
UVS International		

Coordination

The start-up of the ICC was coordinated with:

- **the chairman of EUROCAE WG73 SG4 on Light UAS;**
- **the chairman of JARUS.**

ICC

International Coordination Council

Principal

- Open to the international Light UAS (<150 kg) community;
- No single organization dominates;
- Increase the flow of information to all;
- Promote international coordination, cooperation & understanding.

Drivers

- Implement the recommendations produced by the Interim Working Group on Light UAS;
- Permit the international Light UAS community to contribute in a significant way to the standards work concerning Light UAS within the framework of EUROCAE WG73 SG4;
- Create a structure & methodology permitting SMEs & SMIs to contribute without over-stressing their personnel, time & financial limitations;
- Permit the national entities to elaborate their contribution in their national languages & supply national opinion papers in English.

Harmonization

- The national position papers are harmonized in EUROCAE WG 73 SG4 on Light UAS;
- Each ICC member delegates one or several representatives to participate in EUROCAE WG 73 SG4 on Light UAS.

Light UAS Working Group

SG1 - LUAS SAFETY ASSESSMENT

Federating The International UAS Community

SAFETY ARGUMENTS

- Safety Assumptions
- Management
- Operations
- System Description
- Safety Performance
- Developments
- Managed Evolution
- Safety Case Control
- Assurance of Compliance
- Acceptability of Safety Performance

SAFETY MANAGEMENT

- Safety Policy
- Safety Organisation
- Emergency & Incident Procedures
- Flight Operations Risk Assessment
- Flight Operations & Application Process

FLIGHT OPERATIONS

- Concept of Operations
- Flight Trials
- Flight Trial Objective
- Flight Demonstration
- Flight Demonstration Objective
- Generic Risk Assessment
- Radio Frequency Protection

SYSTEM DESCRIPTION & SAFETY ASSURANCE

- UAS Design & Description
- Aircraft Guidance & Control System
- UAS Crew
- Pilot Station
- Communication Systems
- Additional Pilot Station Systems
- Telemetry System
- Launch & Recovery Systems
- Main Hazards & Mitigation

SAFETY PERFORMANCE

- Incident Handling
- Safety Surveys

Light UAS Working Group

SG2 - FLIGHT CREW LICENSING

Federating The International UAS Community

GROUND SCHOOL

- Air Law
- Aircraft General Knowledge
- Flight Performance & Planning
- Human Performance & Limitations
- Meteorology
- Navigation & Communications
- Operational Procedures
- Principles of Flight
- Communications

FLIGHT ASSESSMENT

- Flight Envelope
- Asset Management
- Methods of Command & Control
- Navigation & Communications
- Crew Management
- Emergency Procedures
- Ground Handling
- Launch & Recover
- Departure & Arrival
- Maintenance & Support
- Mission Systems
- Systems Performance
- Investigation Procedures

Light UAS Working Group

SG3 - OPERATOR LICENSING

Federating The International UAS Community

ADMINISTRATION

- Basic Concepts
- Legal Requirements
- Organisational Requirements
- Appointments & Responsibilities
- Accident & Incident Reporting
- Investigation Handling
- Medical Policy
- Recruitment, training & currency requirements

FLIGHT OPERATIONS

- VFR & IFR
- VLOS, ELOS, BLOS, BRLOS Operations
- LOS Communications
- Satellite Navigation
- Satellite Communications
- Operating & Weather Minima
- FIR / International Transit
- High Altitude
- Low / Ground Level
- Long Duration (days, weeks, months)

FLIGHT PLANNING

- Basic Concepts
- Light UAS Performance
- Operational Planning & Briefing
- Equipment & Payload Carriage
- Extreme Weather Operations
- Navigation & Communications
- Aerodromes, Launching & Landing Sites
- Night Flying
- Flight Time & Duty Hours
- Documentation

APPLICATION SPECIFICS

- Aerial Imagery (photography, video, photogrammetry)
- Aerial Sensing (scientific & research)
- Utilities (oil, gas, power lines, communications)
- Emergency Services (police, fire)
- Security Services
- Urban Operations
- Multi-Aircraft Operations
- Disaster Management

Light UAS Working Group
Input & Information Flow

GLOBAL ACCESS INITIATIVE

Federating The International UAS Community

Australia, Canada, Czech Rep., France, Germany, Norway, Spain, UK + European Air Sports, RCAPA

UVSI ICC National Inputs

Individual Companies & Organizations

LIGHT UAS WORKING GROUP

CAAs : Australia, Austria, Belgium, Brazil, Canada, Czech Rep., France, Germany, Italy, Malta, Netherlands, Norway, South Africa, Spain, Switzerland, UK

JARUS

ASTM

WG73

RTCA SC203

SAE International

European Commission - DG MOVE

ICAO

EASA

Eurocontrol

EDA

National Military Authorities

NATIONAL AUTHORITIES

National Implementation

National Qualified Entities

= Work Inputs

= Draft Documents

= Comments

= Final documents

Current Status of Co-ordination & Co-operation

Federating The International UAS Community

- DG MOVE, Eurocontrol, FAA & ICAO are playing dynamic federating & leading roles
- EASA has produced its A.NPA after wide international consultation
- UAS standards work in EUROCAE WG73 & RTCA SC203 is progressing
- EUROCAE & RTCA are coordinating their UAS activities
- Eurocontrol has produced the UAV-OAT document
- EASA & Eurocontrol & FAA are coordinating their UAS activities
- National CAAs in Australia, Austria, Belgium, Brazil, Canada, Czech Rep., France, Germany, Italy, Malta, Netherlands, Norway, South Africa, Spain, Switzerland, UK have formed JARUS to coordinate & harmonise their activities relative to LUAS
- JARUS has produced its first deliverables
- ICAO has started up the UAS Study Group which has produced an advisory circular
- EC DG TREN has organized its first Hearing on LUAS (Oct '09)
- ICAO's Global ATM Forum on Civil/Military Coop. (Oct '09) had UAS on the agenda
- EUROCAE WG73 SG4 on LUAS has produced an advisory circular for CAAs
- EC-funded INOUI Consortium has produced its final report
- EC has organised its first UAS conference to create political awareness
- EC is organising a "high level group" which will actively promote LUAS access to airspace + identify & fund required R&D & technology validation demonstrations
- The upcoming World Radio Conference has UAS on the agenda

Conclusion: A coordinated European & international approach is becoming reality

Global Access Initiative

Instigated by UVS International **in Aug. '05**
co-ordination with UNITE/ACCESS 5

Encourage creation of national UAS industry working groups, organizations & associations to create National Visions.

Reach out to all relevant stakeholders on a global scale.

Facilitate the international exchange of information.

Promote & coordinate collaboration on international scale.

Promote early stage international harmonisation of UAS-related standards, rules & regulations permitting UAS insertion into non-segregated airspace, while maintaining or increasing current flight levels.

www.uvs-info.com

World's largest generic UAS web site

Make all information pertaining to work ongoing internationally regarding the introduction of UAS (all categories) into non-segregated airspace available to ALL .
Reference docs [military - regulatory authorities - studies - white papers (scientific, government & commercial user groups)]

CONCLUSIONS

Federating The International UAS Community

UAS access to non-segregated airspace is a GLOBAL ISSUE

Significant national & international efforts are underway

No single country can come up with the "global" solution

International coordination & cooperation is crucial

Experience, study results & information should be shared

- Regulatory Authorities
- Industry
- Military
- Government
- Internal Security
- Academia
- Scientific Community

National Visions + European UAS Vision + North American Vision → **Global UAS Vision**

ALL international stakeholders should be involved

Participation in EUROCAE &/or RTCA WGs is encouraged

Obtaining High Level Political Support Is Now Imperative

RECOMMENDATIONS

Federating The International UAS Community

Brazilian **participation in:**

Is encouraged

- **EUROCAE WG73**
- **Working Group on Light UAS**
- **Global Access Initiative**
- **“ Minimal Risk ” UAS initiative**
- **UAS Petition Letter Initiative**

Brazilian Stakeholders

Regulatory Authorities	Industry	Military	Government	Internal Security	Academia	ANSPs
	Research / Scientific Community				Regional Government	

are invited to join & form the Brazilian national UAS vision, give Brazil a concerted national UAS voice towards the international UAS community, and become active participants in the ICC

The Brazilian UAS stakeholders are invited to become members of UVS International and support its actions for the international UAS community

Brazilian UAS Vision + **European Union Vision** / **North American Vision** / **Other National Visions** → **Global UAS Vision**

UVS INTERNATIONAL

86 rue Michel-Ange
75016 Paris, France

Tel.: 33-1-46.51.88.65
Fax: 33-1-46.51.05.22

pvb@uvs-international.org
pvb@uvs-info.com

www.uvs-international.org
www.uvs-info.com

Federating, Instigating, Coordinating, Cooperating, Promoting, Disseminating Information for the Benefit of the International Unmanned Systems Community