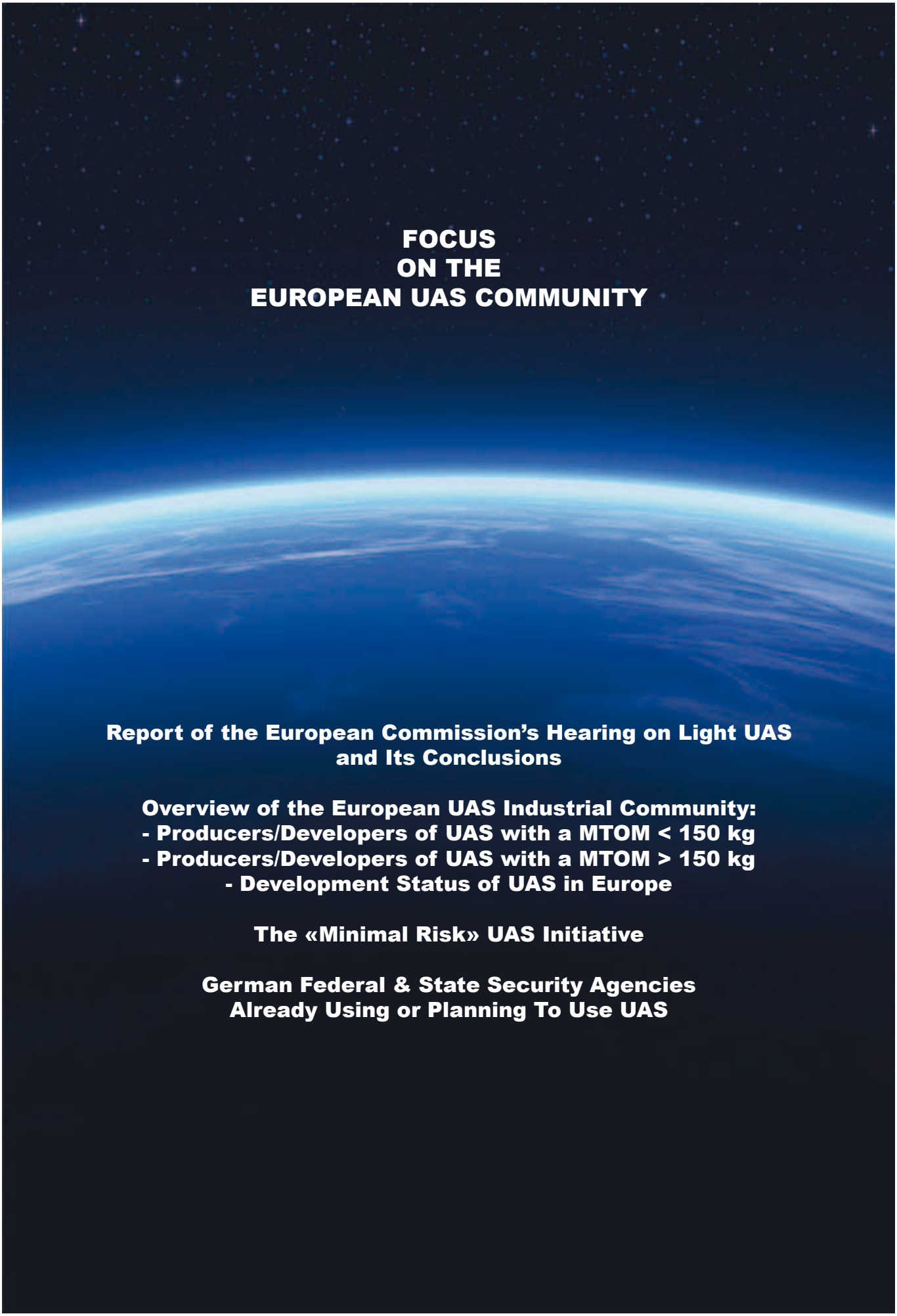

FOCUS ON THE EUROPEAN UAS COMMUNITY

Report of the European Commission's Hearing on Light UAS and Its Conclusions

Overview of the European UAS Industrial Community:
- Producers/Developers of UAS with a MTOM < 150 kg
- Producers/Developers of UAS with a MTOM > 150 kg
- Development Status of UAS in Europe

The «Minimal Risk» UAS Initiative

German Federal & State Security Agencies Already Using or Planning To Use UAS

European Commission
Directorate General Mobility and Transport

REPORT OF THE HEARING ON LIGHT UAS BRUSSELS, BELGIUM - 8 OCTOBER 2009

Unmanned Aircraft : A New Field for Civil Aerospace Development

Aviation has been mainly developed along the concept of aircraft operated with a pilot operating on board. The idea to use unmanned or remote piloted aircraft for specific applications emerged at the earliest ages of aviation, but the necessary technology was lacking to rend it viable. The evolution over last years in the aerospace sector is now providing all the necessary technical tools to make the insertion of unmanned aircraft in the airspace a reality. Therefore, unmanned aircraft is becoming new paradigm for aviation, creating new potential usage, but requiring an adapted approach compared to the one applied to manned aircraft.

First approach to Unmanned Aircraft (UA)

From a definition point, an unmanned aircraft (UA) is a pilotless aircraft, in the sense of Article 8 of the Convention on International Civil Aviation, which is flown without a pilot-in-command on-board and is either remotely and fully controlled from another place (ground, another aircraft, space) or programmed and fully autonomous.
Whether the aircraft is manned or unmanned does not affect its status as an aircraft, each category of aircraft having the potential for future unmanned versions. Unmanned aircraft must be differentiated from aircraft used for recreational purposes and designated as model aircraft, unmanned aircraft being used only for commercial or aerial work purposes. Non-power driven aircraft are excluded from the unmanned aircraft family.
The following terms are also encountered for the designation of unmanned aircraft (systems): drone, RPV (remotely piloted vehicle), UAV (unmanned aerial vehicle, unmanned air vehicle), UAV system. The term unmanned aircraft system (UAS) is now preferred by the sector, covering the flying vehicle itself and all the components necessary to accomplish the mission objectives.

In Europe unmanned aircraft are divided in two major groups, which are each regulated by different authorities:
- UA with a maximum take-off mass of more than 150 kg. These systems are regulated by the European Aviation Safety Agency (EASA);
- UA with a maximum take-off mass of less than 150 kg, commonly designated as Light UAS. These systems are regulated by the national civil aviation authority.

The emergence of civil applications for Unmanned Aircraft

The Unmanned Aircraft Systems (UAS) are currently principally used by the military, but there is a growing interest for non-military usage in the civil environment for a number of governmental functions, like border control, fire fighting, ground traffic surveillance, and pollution control. Unmanned systems reduce human life exposure in long, dull, dirty or dangerous air missions. They provide potential economic savings and environmental benefits with less fuel consumption, less CO2 emission, and less noise than for manned aircraft.
Current military UAS types are now migrating into civilian roles and applications, while newer designs are being tailored specifically for the civil market. The development of unmanned aircraft also contributes to the improvement of manned systems, in particular in support of single pilot operations and for the development of anti-collision systems, and shall be a valuable enabler for testing and implementing new technologies and procedures for the aviation as a whole.
In the short-term, the majority of systems used will be small or mini-UAV systems that are easier to use within the present air safety regulatory framework. Procurement of light unmanned aircraft systems is facilitated by the low required financial outlay, the less sophisticated payload requirements (when compared to military) and the lower training burden. By the middle of the next decade, European government use of UAS is expected to grow consistently for non-military applications[1].

Insertion of Unmanned Aircraft in European Airspace: The Challenge Ahead

The absence of European legal framework for UA integration

The full and seamless integration of unmanned aircraft in European airspace is a huge challenge for the whole aviation community. The emergence of the unmanned aircraft market is currently quite limited due to the impossibility to routinely fly unmanned aircraft within national airspaces and across national borders. The absence/lack of a European regulatory framework encompassing civil and military unmanned aircraft, prevents the development of legally authorized unmanned aircraft operations.
This situation does not allow the industry to build pertinent business plans and to develop new products adapted to their clients.

UAS integration within the Single European Sky context

a) The difficulty to achieve a single internal market

The European industry needs sufficient economies of scale to be confident of a return on their investments in the unmanned aircraft segment. The future military market for unmanned aircraft alone is insufficient to effectively amortise the high costs of development and certification, unit production costs being uncompetitive or even unaffordable. In the future, internationally competitive unmanned aircraft therefore need to transcend the civil, security and defence sectors.

b) The difficulty to operate in European airspace

The Single European Sky (SES) aims to establish a European air traffic management environment capable to accommodate the future growth of aviation in Europe, while maintaining a high level of safety and a good quality of service.
It provides a set of measures enabling safer, greener and more cost-efficient flights, putting the needs of airspace users at the core of the system. SESAR is the technological pillar of the

[1] Single European Sky ATM research

SES, and brings together all aviation stakeholders to develop, validate and deploy a new generation of air traffic management system throughout Europe over the next thirty years.
The Single European Sky, complemented by the SESAR Programme, provides the overarching context for enabling the safe access to the airspace for all legitimate airspace users without any discrimination. Specific constituents like unmanned aircraft clearly have to be considered in that context.

c) First attempt to inventory the obstacles

Under its 6th Framework Programme, the European Commission supported the INOUI[2] project, which aimed through a holistic approach to identify the necessary requirements to insert unmanned aircraft in the future Air traffic Management (ATM) environment (SESAR). INOUI federated most of the current efforts made by the sector through civil-military cooperation and a multidisciplinary approach, bringing together industry, authorities, international organizations and agencies, air navigation service providers, and others.
INOUI assessed future operational concepts for unmanned aircraft and identifies procedures and requirements, evaluating the necessary actions to be taken to insert unmanned aircraft at the earliest possible point in time. Certification requirements and related processes were also looked at, as well as the potential benefits from System Wide Information Management (SWIM). It also addressed safety issues for UAS and aimed to develop high level safety objectives and requirements.
INOUI has produced several deliverables publicly available and covering concepts for civil UAS operations, and the definition of the future unmanned aircraft environment, UAS certification, safety criteria and the scope of related risks. The INOUI project results were presented to the unmanned aircraft stakeholder community in a final dissemination forum in December 2009.

Methodology followed by the European Commission

The European Commission is assessing what could be its potential role to support the emergence of the unmanned aircraft sector. Before launching concrete actions, it is necessary to fully understand the potential European industry baseline, the potentialities and benefits offered by UAS to the European citizens, and the existing obstacles to the market emergence.
In order to achieve this, the EC shall meet the various stakeholders of the UAS segments through dedicated hearings and a high level Conference, which will take place in April 2010.
The insertion of unmanned aircraft has been integrated in the Single European Sky work plan and was presented to the Single Sky Committee (SSC) and to the Industry Consultation Body (ICB) in July 2009.

Objectives of the Light UAS Hearing Conducted on 8 October 2009

The first hearing dedicated to unmanned aircraft took place on Thursday 8th October 2009. It was dedicated to the Light UAS segment, which is composed of unmanned aircraft with a maximum take-off mass of less than 150 kilograms. The main objectives of this event were:
- To understand the current European Light UAS industrial base and the current Light UAS applications in Europe.
- To identify potential obstacles, enablers and best practices in Europe;
- To exchange directly with the European Light UAS community views and assess the future potential role of EC for the insertion of Light UAS.

Conduct of the Hearing

A wide representation of the European Light UAS sector

The event was attended by 49 European representatives of the civil Light UAS community. The hearing gathered governmental authorities, manufacturers, flight service (aerial work) providers, national police forces, fire brigades, national and international associations and working groups, research organizations, EUROCAE, and the European Defence Agency (EDA).

Support for the hearing

A survey has been conducted by UVS International[3] specifically for the hearing. Conducted during the summer 2009, it provided a very useful overview of the current Light UAS sector involved in systems for non-military applications.
The hearing was also supported by 12 presentations given by European users of Light UAS:
- 6 governmental entities already using Light UAS for specific missions:
  - Estacion Biologica de Donana - Conseja Superior de Investigaciones Cientificas (CSIC), Spain ;
  - National Police, Anti-Drugs Force, The Netherlands;
  - Ministry of Interior, Directorate General of Federal Police, Germany;
  - Northern Research Institute, Norway;
  - Swedish Forestry Agency, Sweden;
  - West Midlands Fire Service, UK.
- 4 companies and 1 association:
  - Aeroart, France ;
  - Aerofilmphoto & Vision du Ciel, France;
  - Gatewing, Belgium;
  - HighEye, The Netherlands;
  - UVS International, The Netherlands;

Main areas of discussion

Four main domains of interest were covered by the discussions:
- Nature and specificities of the European Light UAS industry base;
- Current public and private applications taking place in Europe;
- Potential advantages and benefits of Light UAS to European citizens and users;
- Obstacles and difficulties relative to Light UAS operations and their development in Europe.

Content of the Discussions

The European industrial and developmental base for Light UAS

The size of the European Light UAS industry is significant, with an industrial and developmental base of 105 small and medium enterprises (SMEs) and 10 industrial entities[4] involved in this business. The SMEs are a significant dynamic force, especially in the field of systems dedicated to non-military applications. Numerous SMEs are also indirectly involved in the market through the development of payloads, specific parts of the UAS (battery, software, engines, etc.) or by the provision of services based on or using UAS.
Most of the SMEs investing in the Light UAS segment sector are not part of the traditional aviation community and their

[2] http://www.inoui.isdefe.es/INOUI/
[3] UVS International (Unmanned Vehicle Systems International) is a non-profit international association composed of 260 corporate and institutional members in 37 countries. Dedicated to the promotion of unmanned systems (air, ground & naval), it supports and represents the interests of its international members on a world-wide basis. Members represent all areas of industry, government (civil & military) and academia with an interest in unmanned systems (air, ground & naval).
[4] Industry is classified as having more than 250 employees and an annual turnover of over 50 Million €. An SME is classified as having less than 250 employees and an annual turnover of less than 50 Million €;

interests are therefore not represented by specific aviation-related associations.
The large companies are hardly involved in the development and production of Light UAS, principally because their overheads are too high to permit the supply of a final product for non-military applications at an acceptable market price. They are nevertheless often teamed with SMEs involved in the development and the production of Light UAS.
The European Industry is well developed in the field of Light UAS. However, the absence of harmonised rules and regulations to operate in European airspace, and the lack of the necessary political support (due to insufficient awareness) might jeopardize all the efforts made so far to keep this new emerging branch of the aerospace sector at the frontline.

Current applications based on the effective usage of Light UAS

The hearing showed that Light UAS are already used in Europe for a large spectrum of governmental and non-governmental applications.
The market for Light UAS already exists and presents many potentialities, which are in many cases not yet identified by many of the potential users. The potential interest relative to the use of Light UAS is being transformed, step by step, into factual use by governmental authorities (See Annex 2), despite a limited - and sometimes experimental - usage. Most of the current applications presented are of high value for the citizens, and could create motivation with new customers to evaluate the potential offered by unmanned aircraft systems, thereby significantly increasing the short/medium term market potentialities.
The use of Light UAS is significant for civil security operations, in particular for supporting the fight against building fires, post fire investigations, motorway road traffic collision monitoring, chemical cloud release monitoring, searching frozen lakes for missing persons (thermal). UAS greatly improve the pre-intervention situational awareness of the authorities, which can be of prime importance in case of dangerous environments like collapsed buildings (earth quakes), chemical clouds, floods, etc.
Light UAS are also widely used for the monitoring of wildlife and nature observation, and reveal excellent capabilities in support of the meteorological domain (better capabilities/ manoeuvrability than balloons). The following applications were also highlighted at the hearing: atmospheric and climate research, land monitoring (vegetation, fauna, hydrology, salt water infiltration) and ocean monitoring (sea-state, algae, sea-ice, and icebergs).
Light UAS are also capable to efficiently complement satellites, offering an excellent reactivity and a more permanent availability to the relevant authorities. UAS bridge the gap between what can be measured by satellites and what is measured at static ground-based research stations.
Most of the governmental non-military applications take place on an exemption basis without any existing legal framework, a potential risky situation for the whole UAS community, if any accident occurs. Very few national operational rules relative to aerial works are established, creating a legal barrier to the development of the market for manufacturers and aerial work suppliers.

Potential advantages and benefits of Light UAS for citizens

Light UAS provide authorities with new possibilities that did not exist before with manned aircraft. They limit physical risks for civil servants in dull, dirty and dangerous environments, due to the absence of crew on board and the non necessity to be physically involved on site.
Light UAS are easy to transport, relatively simple to deploy, easy to launch and recover, and show real advantages in terms of durability, modularity, silence, substantial autonomy and high degree of controllability.
The absence of pilots onboard the air vehicle brings new potentialities in terms of protection of the environment, noise abatement, reduced fuel consumption and CO2 emission. Light UAS present a high level of mobility and reactivity, supplying authorities with a rapid response capability in support of outdoor and indoor operations. Simpler than any manned aircraft systems developed for similar activities in terms of deployment and use, Light UAS have low cost operations and are less demanding in terms of resources allocated.
Light UAS allow long time surveillance, modularity through fusion of data coming from multiple onboard sensors (electro-optic, infrared, radar, etc…), and operations under extreme conditions.
Light UAS also complement data obtained from manned aircraft and satellites to better fit user's requirements, while creating possibilities of synergies of systems by combined operations. Unmanned aircraft systems enable persistent observation on demand, with a crew replacement that does not affect operations.
The user base for Light UAS is very large, enabling the use of these systems for all types of missions and by a large customer base. They also offer possibilities for operations run by public and private entities, thereby creating new business opportunities for the sector. Most current non-military Light UAS applications take place within visual line-of-site and at altitudes inferior to 150 meters, and are therefore outside airspaces used by manned aircraft. Consequently, a significant number of applications could rapidly be fulfilled with the existing Light UAS technology.

Current obstacles to Light UAS development

a) Lack of legal European environment

In Europe, no harmonised rules and standards exist for the insertion of unmanned aircraft. The certification and operational requirements for Light UAS with a minimum take off mass below 150 kg are the responsibility of the European National Aviation Authorities (NAA). The European Aviation Safety Agency (EASA) is responsible[5] for unmanned aircraft above the 150 kg limit. Due to the complexity of the task, very few States have developed ad hoc legislation and certification processes, and currently no harmonisation has taken place between national regulations. However, several States are attempting to address this topic within the JARUS initiative[6].
The absence of legal framework hampers the development of the European Light UAS market and adversely impacts the possibilities to conduct cross-border operations and the exchange of systems and personnel between national authorities. This situation also obliges the manufacturers to adapt the specifications of the systems for each Country where they are to be deployed or sold, generating an unbearable complexity and important additional costs. Because of this situation unmanned aircraft operations are principally restricted to segregated areas, which is a strong limitation to the full exploitation of the potential capabilities and qualities of Light UAS.
The International Civil Aviation Organization (ICAO) has engaged activities related to the insertion of unmanned aircraft, but the development of ICAO rules is not foreseen before a long time. Additionally, ICAO does not consider

[5] According to Article 4.4 of EC Regulation 216/2008
[6] JARUS (a regulatory working group consisting of the national civil aviation authorities of 15 countries: Australia, Austria, Belgium, Canada, Czech Rep., France, Germany, Italy, Malta, Netherlands, South Africa, Spain, Switzerland, UK)].

itself competent in the field of Light UAS.

b) Lack of training and licensing requirements

There is no harmonisation of European standards relative to the recruitment, training and licensing of personal involved in Light UAS operations, procedures and proficiency levels. This situation prevents operators and pilots to have a common base of knowledge and skills, and prevents the implementation of similar procedures and mutual recognition of Licences. This is also a brake to the mobility in Europe of the qualified staff.
A dual civil/military approach to the training and licensing issue could provide military pilots with the possibility to operate Light UAS in a mixed environment and provide them with a better perspective in terms of recycling from military jobs into non-military ones, when retirement time comes around.

c) Lack of airspace access

Very few Countries have defined specific rules for the Light UAS access to the airspace, and currently no harmonisation exists between the approaches taken. The criteria to operate in proximity of populated areas or in urban areas are not harmonised, creating differences in the way to operate.
For Light UAS operations below 150 meters, where no interference can occur with manned aviation, rules and equipment applied are still derived from manned aircraft standards, and are therefore not adapted to their specific needs.
Most of the time, the delivering of flight authorisations for aerial work is subject to long procedures, which are identical to manned aircraft activities. Made on a case-by-case basis, at a local level, the time to get a permit may range from a few days to several weeks. In many cases, local authorities are not familiar with those new systems and the lack of regulation and harmonisation of legislation causes long procedures due to the difficulty to address the authorisation of unmanned aircraft flights. Aerial work suppliers and their customers are therefore obliged to plan the flights far in advance and to submit the necessary applications well ahead of time. This situation adversely affects the potential use of Light UAS for emergency missions or governmental use, and diminishes the added value of flexibility and mobility required for such applications.

d) Common certification processes and standards: A must for the industry

In Europe, no harmonised technical airworthiness code has been developed for Light UAS, and no type approval/ certification process is in place. The UAS sector below 150 kg is composed of aerial vehicles of very different types, capabilities, size and weight. Therefore, adaptation shall be required to accommodate them on the basis of their intrinsic relevant risk levels.
The Light UAS community needs a single certification process applicable in all EU States that should provide national authorities with:

- A single set of safety rules applied uniformly in all States;
- A clear affordable process with clear steps and specific outcomes;
- A short process to enable fast track certification for Light UAS deployed in emergency and time critical deployments;
- A set of rules allowing minimum segregation for operations. In many States, the grant of an aerial work license to a UAS operator is almost impossible, as no appropriate framework for certification of the unmanned aircraft systems exist. This affects the development of professional activities based on Light UAS utilisation for governmental and commercial use.

e) The absence of definition of safety levels

The perception of the safety levels and requirements is not harmonised among Countries and is subject to frequent changes. The safety criteria are currently based essentially on risk assessments, and no systematic and pan-European approach exists for their definition. The requirements applied too Light UAS are most of the time identical to those applied to manned aircraft and therefore do not necessarily meet the specifities of unmanned aircraft systems.
In the field of safety, there is a great fragmentation of the developments related to the system components contributing to enhance the level of reliability and safety, such as: shock absorbing and frangible airframe structures, electric propulsion units, fail safe systems, automatic take-off and landing/recovery systems.
The absence of a federated research and development effort is therefore limiting the possibility to obtain results and appropriate answers for the industry. The European approach should permit to get short term solutions and benefits and to ensure convergence of choices.

f) The absence of common requirements

Unmanned systems are characterized by a separation between the pilot in command and the aerial vehicle. Compared to manned aircraft, this requires additional communication sub-systems to ensure a permanent and reliable dialogue between the various constituents of the system, and in particular between the pilot and the aircraft.
Dedicated solutions for UAS are mainly derived from existing technologies and procedures. However, specific developments are probably necessary in order to better match Light UAS requirements, due to the importance of getting miniaturised systems, low power consumption systems, which may also vary depending on the type of UAS used, the type of missions, the flight environment and the distance between the pilot the vehicle.
Light UAS need to rely heavily on communication, navigation and surveillance (CNS) technologies that are essential for ensuring their safe, efficient, secure, and reliable integration into the airspace. This is also essential to ensuring that flight operations are transparent to other airspace users and air traffic controllers, and that they do not have a negative impact on current safety levels.
UAS missions need a data link to control and command the unmanned aircraft, and another data link to down-link onboard payload. The safe and secure command and control of unmanned aircraft can only be guaranteed with a high level of safety, if the necessary connectivity exists, and the required frequency and bandwidth to control the unmanned aircraft are available, in particular when the unmanned aircraft is beyond the line-of-sight of the control station or outside radio coverage. The knowledge of all flying parameters (down-linked to the control station by telemetry) is essential to ensure the appropriate handling of the aircraft, and when automatic phases of flight are conducted, the pilot must, in the case of unexpected or emergency situations, be able to take over direct control of the unmanned aircraft.
The lack of dedicated radio frequencies seriously hampers unmanned aircraft that must have access to appropriate spectrum frequencies to operate. Operators are currently not able to rely on dedicated and interruption-free data links using dedicated and secure frequencies.
Satellite systems can play an essential role in this command and control capability, since they offer the possibility to control the unmanned aircraft any place where satellite coverage exists. The use of satellites also enables the necessary transfer of appropriate data with an acceptable level of permanence and reliability, which is essential for the

safe operation of UAS in segregated and non-segregated airspace. Appropriate high speed data links should be available to ensure that maximum benefits shall be provided to UAS operations.

g) Weather conditions: a natural adversity of Light UAS operations

Light UAS are sensitive to the changes impacting their environment, like wind speed, turbulence, rain, hail, snow, icing, low temperatures, which effect both the operators and the equipment. Therefore, it is necessary to ensure that common operational standards, mandatory on-board equipment and crew skills are defined to ensure maximum reliability of the system in all situations. .

h) Miscellaneous elements to be further addressed

The responsibility and liability of the different actors involved in the operations of Light UAS are not precisely defined, as the role and the main obligations of the stakeholders concerned being different from one State to another.
The insurance regime applied to Light UAS operations must be clearly defined, divergent policies being applied by companies. The cost of the insurance can be prohibitively expensive and beyond the funding capabilities of unmanned aircraft operators, as in some cases the insurance companies compensate the absence of legal framework by an overcharging. It is not sure at this stage, that a single insurance policy is sufficient to cover a UAS operator.
Export restrictions might be applied for Light UAS, as some Countries classify them as military equipment, or dual purpose systems. A restriction to the export of certain UAS sub-assemblies and/or components also impacts the exportability of the UAS.

Conclusions and Recommendations

This first hearing has been a real success and a fruitful exercise. The Light UAS community has provided the Commission with a great number of elements of appreciation the current situation relative to Light UAS, allowing a better understanding of their requirements, and permitting to define the line of action required for the introduction of Light UAS into European airspace.

The hearing demonstrated that light UAS are already used by a significant number of governmental authorities, in particular for police, customs, border control, fire fighting, natural disasters, and search and rescue missions.

Unmanned system-related technologies are of strategic importance for Europe, with many potential spin-off applications, possibly even including for manned aviation. Like it was the case with space, unmanned aircraft may catalyse developments for complex technologies, including low fuel consumption, fuel cells, small large capacity batteries, computers and systems, green engines, sensors.

Light unmanned aircraft can be viable and competitive products, if they are low cost entry-level solutions for customers. Once a legal framework exists, a totally new aerial work service supply industry should sprout rapidly.

A minima European regulation could speed up the emergence of the market, the routine deployment of Light UAS being hampered by the current regulatory situation in Europe. The fast-track creation of dedicated standards and rules and regulations would be beneficial for the European Light UAS industrial community and provide civil society with a very wide range of benefits. In addition, it would make it possible for a totally new aerial work supply community to form, thereby not only creating new jobs, but also a new market for Light UAS.

Non-military Light UAS operations are currently mainly conducted at altitudes inferior to 150 meters above ground level and within visual line-of-sight. In that condition, the operational environment does not conflict with flights of manned aircraft. This calls for the development of specific rules for Light UAS, simpler than those existing for manned aircraft, or that will be required for unmanned aircraft with a mass of more than 150 kg.

The European legislation should be very simple, covering essential elements like certification of UA system, training and licensing of the pilots and flight crew, responsibilities and obligations of all stakeholders, liability security and insurance issues, licence to operate, reliability of the components, maintenance matters, and security aspects. The legislation should take into account the specificities of Light UAS, but should ensure the maximum safety and security level, maintaining the current overall safety level. Rules and standards should be in equation with the aviation standards currently applicable for manned aircraft (equivalent level of safety), but should put the lowest possible constraints on manufacturers and users.

The full and seamless integration of Light UAS into the airspace shall require an important amount of common efforts from the aviation sector. A lot of work has already been done in these domains and could be used for the development of harmonised rules & standards at European level. The European Commission should support such harmonization efforts by federating the activities and developing European standards and rules applicable uniformly throughout Europe.

Detect & Avoid is a critical factor relative to the operation of Light UAS beyond visual line of sight, and it can be considered as the necessary enabling technology required to integrate Light UAS into non-segregated airspace. The possibility of launching a call for a funded study and technology demonstration relative to detect & avoid specifically for Light UAS should be investigated.

Without prejudice to the right of States to certify UAS below 150 kg, and taking into account the advantages of European harmonization, it is considered necessary to develop national legislation, based on consensually agreed criteria, in all European Union countries. The development of such harmonized rules and regulations would permit to ensure the recognition of the various certificates and licences between the countries of the European Union, as well as to provide all Light UAS manufacturers with similar standards.

The establishment of common European standards should allow trans-border cooperation between authorities, multi-lateral operations, and the transfer of systems and crews from one country to another (i.e. for security, atmospheric sensing, meteorological, environmental and research applications, and to address natural disaster crisis such as earth quakes, floods, forest fires, oil spills, etc). A single set of rules for Europe would favour the creation of an open and fair European market.

It is necessary to harmonise the requirements and limitations for Light UAS certification and operations within Europe, but also to harmonise the requirements with a number of non-European Union regulators such as the FAA, Transport Canada and Civil Aviation Safety Authority Australia. Europe should produce a single set of draft airworthiness, operational and airspace requirements to be applied on a voluntary basis by aviation authorities. The process should be based on the examination of existing standards and best practices.

As most manufacturers and aerial work service providers will have the intention to sell their products or their services outside the limited remit of their national boundaries, a single set of

rules for Europe would favour the creation of an open and fair European market. This shall be the case not only for the 27 European Union States, but also in all the countries having bilateral or multilateral agreements with Europe for aviation (currently 38 States in the Single European Sky implementation region).

A significant number of European and non-European national aviation authorities are jointly endeavouring to develop specific rules for Light UAS, which may be applied at European level. It is required to implement methodology in Europe to ensure full cooperation between existing working groups like JARUS[7] and EUROCAE WG73 and other EU and non-EU initiatives that address UAS-related topics of interest. All the work done may constitute an excellent baseline material to be used to further, at European level, the aspired to harmonised rules and regulations. The hearing demonstrated that the European Commission can play an important role in the support of this process.

It has been understood that, due to the specific characteristics of Light UAS and the large number of SMEs involved with these systems, the Light UAS community should probably need to be recognized as a separate stakeholder group.

Therefore, it was understood that the Light UAS community should be recognized as a separate stakeholder group and should benefit of ad hoc working arrangements clearly separated from the activities conducted for other segments like MALE[8] or HALE[9] systems.

In particular, it is recommended that standardisation groups like EUROCAE evaluate the possibility of starting up dedicated activities aiming to develop specific solutions for Light UAS, with the view to speed up their insertion by producing dedicated standards. This suggestion is motivated by the following:

1) The large number of SMEs involved with the development of Light UAS;
2) SMEs are unable to participate in working groups on the same basis as Industry, mainly due to insufficient personnel, time & financial restrictions;
3) The standards for Light UAS have a specific and diverging nature in comparison to UAS with a maximum take-off mass superior to 150 kg;
4) The work methodology adopted, must be designed to specifically accommodate SMEs.

Furthermore, it is recommended that the European Light UAS community designate a representational entity to express their views and voice their interests. High political awareness of UAS matters, at national and European level, has to be improved, or created. To that end, the European Commission shall address the Light UAS dimension during the high-level UAS conference that it is organising in Brussels, Belgium on 21st April 2010.

[7] JARUS (a regulatory working group consisting of the national civil aviation authorities of 15 countries: Australia, Austria, Belgium, Canada, Czech Rep., France, Germany, Italy, Malta, Netherlands, South Africa, Spain, Switzerland, UK)].
[8] Medium Altitude Long Endurance
[9] High Altitude Long Endurance