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LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG

Ministère de la Mobilité et des Travaux publics

Direction de l'aviation civile

A l'attention de M. P. JAEGER & G. PIERLOT

Subject: Joint letter regarding the consultation sur l'Opinion 01/2020 de l' Agence Européenne de la Sécurité Aérienne concernant la future réglementation « U-Space »

Dear M. Pierlot

On 13 March 2020, the European Aviation Safety Agency (EASA) published a proposal to regulate the co-habitation in the European airspace of manned and unmanned aviation.

This proposal on a high-level regulatory framework for the U-space is based on the three following objectives:

1. To enable manned and unmanned aircraft to operate safely by setting up of a Common Information Service (CIS).
2. To create a competitive European market for U-space services.
3. To meet environmental, security and privacy requirements. This regulation, once adopted, will define the integration of drones into traditional, safe airspace.

We fully support the ambitions of the Opinion to safely integrate drones into Europe's airspace, to create a competitive U-space services market. Luxembourg and Europe cannot stay behind other global markets. From safety, public security, capacity, as well as economic sustainability perspective, it is desirable to have in place a performance based regulatory framework as soon as feasible to handle accommodation of drones in the short term and "complete integration in all classes of airspace" in the long term.

Our main concerns on the draft regulation is that the proposed text does not establish a robust regulatory and safety framework as it either fails to recognise necessary safety and security objectives or fails to assign responsibilities associated with these objectives.

The Regulation needs to have embedded within the aforementioned objectives as it is set to have a profound impact not only on the emerging technologies of U-Space and related services, but on the provision of Air Navigation Services as well.

1. Operating safely

Firstly, I would like to draw your attention to the first objective set by EASA: to enable manned aviation to operate safely.

Whilst the U-space is not restricted for manned aviation, in particular General Aviation, there will be a new obligation to provide the position at regular intervals when flying as uncontrolled traffic within the U-space.

The information will have to be of sufficient integrity, accuracy, continuity and availability as well as security to allow the USSPs to make use of this data for the provision of U-space services. Although it is not specifically presented in the draft proposal as to what exact technologies the aviation actors will be obliged to be equipped with, the document mentions that EASA will aim to explore how the aggregation of multiple technologies and initiatives can serve to improve the current safety levels for the GA and to allow for unmanned operations to take place. We cannot accept as such for new technological solutions to be required from General Aviation to become U-space cooperative. We are having a problem to equip our member's planes at our own expenses in order to create an operational benefit for others, i.e. UAV operators.

If low-cost ADS-B transponders are being used on UAS for identification purposes, as article 3.5.8 seems to suggest, it must be ensured that they are not the sole source of information. Further, they should be compatible with current and future infrastructure requirements. And finally, it should be ensured that ADS-B transponders do not negatively affect the integrity of the 1090MHz frequency band nor saturate the system.

Finally, on the safety topic, the application of minimum height requirements and a minimum distance from settlements and open-air assemblies of persons shall be considered especially for VLL operations to protect the safety of those on the ground, even in the event of contingencies and emergencies.

2. That brings us to the second topic of VLL

The Opinion rightfully acknowledges that in case of specific actors of general aviation certain operations still may occur in VLL for emergency or contingency reasons. This is connected to the fact that specific general aviation actors, such as gliders and balloons, are heavily dependent on the wind and cannot always control their path and intent. Stating that it will be "evaluated" how they will be able to make their position available to the relevant USSP's is simply not good enough and this aspect shall be further addressed to ensure the safety of people who have the right to enjoy common airspace. There are further cultural aspects that the EASA simply omitted, such as flying paramotors or even children playing with a kite.

AOPA Luxembourg and FAL, we clearly do not accept *de facto* privatisation of the VLL in favour of the UAS, whereby the benefits go to the UAS operators and the burdens to the population and the endangered pilots/users of the VLL.

The ICAO airspace classification scheme and UAS airspace categorisation must be coherent. An exclusion of manned aviation from certain parts of the airspace for the benefit of UAS operations would be neither desirable nor practicable and is not in line with the objective of EASA to ensure fair integration of drones with manned aircrafts.

3. The third topic covers the UTM.

An UTM system shall always enable UAS operators to adequately separate their UAS from manned aviation and protect all airspace users from hazardous proximity to and collisions with their UAS. The implementation of a “buffer zone” between UAS VLL flights and the 500ft height boundary can ensure the required target level of safety for manned aviation flights taking place above 500 feet.

In VFR flight, electronic means of mitigating mid-air collision such as ADS-B and air traffic control (ATC) advisories are considered optional and secondary to a visual lookout. There is therefore heavy emphasis on the human eye’s ability to see traffic in close proximity.

This doctrine is inadequate for shared airspace between manned aircraft and UAV. For even the sharpest-eyed pilot, the UAV will be difficult or even impossible to see at a safe distance. Therefore, UAS must carry the burden to “sense and avoid” manned aircraft and other obstacles

Information on airspace must be human-interpretable and user-friendly so the UAS pilot can check the conformance of the UAS position and adjust its flight path according to live requirements. UAS shall be able to receive real-time information via a constant and robust data connection to process it.

The UTM system should provide guidance and set boundaries to UAS operation. To ensure the UAS has the utmost freedom of operation possible, the remote pilot or an autonomous system shall be assisted by on-board functionalities, such as “remain well clear” and “collision avoidance”, potentially allowing UAS to separate themselves. Notwithstanding this, the final responsibility for the safe conduct of the flight rests with the pilot-in-command.

Right-of-way rules, compatible with manned aviation, with priorities to certain flights and in relation to the flight phase should be adopted. Manned aviation traffic shall always have priority over flying UAS machines, as it carries humans, with no exceptions.

For operation in the UTM system a new flight regime comparable to VFR/IFR shall be developed taking into account the specific operational environment of UAS operation in VLL and the necessity for the safe operation of manned aviation.

Telecommunication networks used for UTM will always have to cope with the anticipated total number of users and provide the required datalink capability. 5G technology would clearly enhance the quality and security of the telecommunications networks used by UTM, but it takes quite some time before a nationwide coverage is reached in Luxembourg (the first frequency auction procedure just started) Therefore, alternative procedures for areas without coverage or insufficient bandwidth capacity must be developed.

To conclude on the topic of UTM, we think all service providers connected to the UTM system shall be certified and subject to oversight to ensure the safety of the system and the integrity of data.

Ensure interoperability of UTM with manned aviation and existing ATM systems is therefore essential for the success of the U-Space legislation implementation.

4. The fourth concern with this Opinion relates to the costs of the UAV integration and the role of DAC

Moreover, despite IAOPA's (*International Council of Airplane Owners and Pilots*) calls, EASA did not ensure in the Opinion that General Aviation will not be burdened with the cost of the U-space implementation.

Clearly, general aviation has managed for decades without such U-space services, and thus this requirement seems not to be in line with the main goal of the proposal – to ensure fair integration of drones.

The financing of a UTM system shall be achieved via public funding or with user fees. Cross-financing through fees paid by the manned aviation industry and our pilots is clearly not the right way forward.

The opinion outlines that pricing of common information service (CIS) will be set at the national level, i.e. DAC Luxembourg. This means that together we must ensure that the airplane owners and our pilots will not be weighed down by the integration of drones.

We draw the attention of DAC that traditional aviation may be required to purchase new technology to facilitate drone integration.

We therefore, like to liaise with DAC about the implementation of the legislation, as EASA left certain issues within the national competencies. This means that DAC will have full authority on the designation of the U-space airspace – you will have the power to decide how the airspace is designed, accessed, restricted, etc. – as well as over the pricing of common information service (CIS).

5. A fifth concern with this opinion concerns the noise and visual pollution

Our Luxembourgish Member of the European Parliament, Ms Tilly METZ, filed a parliamentary question on December 20, 2019, addressed to the European Commission and EASA:

“The EASA is currently working on a draft opinion on a U-space regulatory framework. The implementation of a European drone services market will drastically change the nature of European airspace, which until now has been carefully regulated.

The existing EU regulations for drones address their environmental impact, introducing inter alia a maximum permitted noise level. However, a great many questions remain concerning their ecological effects and the consequences for the well-being of EU citizens. Drone operators are seeking to deploy large numbers of commercial drone models, which would lead to a significant amount of visual and noise pollution.

Considering the recent rapid developments in drone technology and the wide range of potential uses for drones, does the Commission believe that the existing regulations will sufficiently protect the environment and the well-being of EU citizens?”

The obtained answer MEP Tilly METZ received was:

“Ensuring societal acceptance of increasing drone operations in the EU has been one of the Commission’s key priorities since the adoption of the Aviation Strategy for Europe in 2015.

With the support of the European Union Aviation Safety Agency (EASA), the Commission developed a comprehensive regulatory framework for drones, which not only aimed to strengthen aspects related to safety, but also covered the fields of security, privacy and data protection, as well as noise and emissions.

On visual and noise pollution, limits reflecting the state of the art in the market have been introduced for small drones with a weight of less than 4 kg and which may be flown close to people by virtue of Regulation (EU) 2019/945(2). These limits may become even lower over time.

As to health effects of noise from drones, they will depend not only on the limits on the product itself, but mostly by the number and the way they will be operated.

In addition, further local noise constraints can be set in respect of ‘UAS geographical zones’, according to the corresponding Union rules.

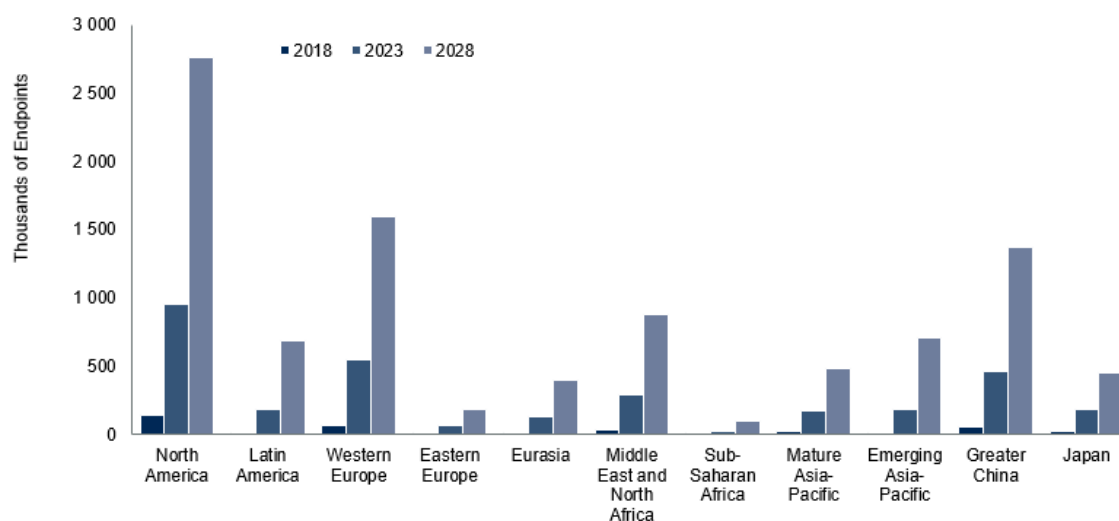
On emissions, Regulation 2019/945 already imposes that small drones must be powered by electricity. If managed properly, drone operations, particularly in urban areas, can contribute to the reduction of pollution, rather than causing additional adverse health effects for the citizens.”

In the meantime, the Opinion has been published and acknowledges the visual and noise topic only slightly, talking about *“minimum level of environmental protection that can be complemented by national measures”* as well.

Gartner published recently a study (Forecast: IoT Enterprise Drones by Use Case, Worldwide, 2018-2028), forecasting strong growth for UAV, with the installed base increasing by a 38% compound annual growth rate because multiple industries are adopting them to reduce operational costs. They

Figure 1-3 IoT Enterprise Drone Installed Base, 2018-2028 Regional (Thousands of Endpoints) [\(Top\)](#) [\(Front Page\)](#)

IoT Enterprise Drone Installed Base, 2018-2028 Regional



Source: Gartner (December 2019)

forecast more than 1.5 million UAV for Western Europe by 2028. The environmental impact of such a mass deployment needs to be assessed

The increased awareness of Luxembourgers and Europeans for noise and visual pollution and the environmental consequences is not addressed in this Opinion. It further entirely bypasses the fact that the noise made by road traffic was "systematically judged to be less annoying" than the high-pitched buzzing made by drones as a recent NASA study by showcased ¹. This Opinion is only providing lip service to the justified environmental concerns.

6. A Sixth Topic of Concerns is About the Security Approach as Such

This Opinion does not properly cover that UAS should be tested and certified under all environmental/weather conditions which can be encountered in VLL operation. The operational and environmental limits of a UAS must be clear to the pilot in order to maintain a safe flight envelope. This includes among other factors wind conditions, effects of precipitation, icing and other atmospheric disturbances.

Weather data in the form of coloured charts, reports and forecasts shall be easily human-interpretable to support the pilot with the safe execution of a flight. All BVLOS flight shall require a prior review of the relevant weather data by the UAS operator.

Altimetry systems of UAS should be compatible with the barometric reference used in manned aviation.

UAS should be equipped with a terrain and obstacle database and sensors that enable a safe operation close to the ground or near infrastructure. Depending on the length of the mission, live updates should be possible.

That is why AOPA Luxembourg and the Fédération Aéronautique Luxembourgeoise calls on any UAV to be registered in a common European database, following uniform data requirements and data-protocols. Minimum information should include a unique UAS identifier, information about the owner and operator, as well as a crash- and fire-proof plaque/device on the UAS.

7. Protection of Personal Rights and Societal Debate

Operating UAV's privately or commercially creates significant issues for individual rights and data privacy, these are among others:

- Putting persons and objects on the ground in danger of injury or death respectively damage or destruction
- Unauthorized imaging or sensing of personal information
- Unauthorized linking and processing recorded data with other personal data
- Not only the respect of GDPR regulations must be assured, but operations of UAV must be such that violations of individual rights and personal integrity are avoided.

¹ <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20170005870.pdf>

Given that Opinion will impact a wide array of lower airspace users in Luxembourg (rescue helicopters, gliders, sport aviation, hang-glidings, etc.) and that it has an environmental impact as well (new and widespread noise and visual pollution), it might be opportune to set-up a national conference and bring together the aviation and environmental stakeholders in order to have a truthful exchange of views and ensure that people of Luxembourg are not negatively affected by the integration of drones in the years to come.

The topic of UAS operation should be presented more effectively to a broader audience to give the society the ability to guide the legislative process with input from a well-informed and represented public.

This will help balance the needs and wishes of the UAS industry, other aviation stakeholders and those of the people.

Advances in technology shall be evaluated to find a healthy balance between what is technically possible and what is beneficial to society.

We miss that this Opinion is scalable, performance based and technology agnostic.

It is therefore essential that the Regulatory framework gives clear, unambiguous, proportionate and achievable legal obligations to all stakeholders concerned.

As we mentioned in the beginning of our letter that we support the ambitions of this Opinion, we offer our support to DAC to improve the current text at Luxembourg level with AOPA Luxembourg, FAL and via IAOPA on EASA/EC level. We think EASA should activate the SAB DRONE Committee (D.COM).

It is essential to ensure the transparency and efficiency of the EASA processes, especially during the Covid-19 crisis where resources will be scarce (e.g. less travel and more frequent remote meetings, and many stakeholders affected by overall budget cuts etc)

We need to create a pause and have more time to work all together
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8. Opportunities & final thoughts

Our requirements for safe integration of UAS into the National Airspace System should not be interpreted as wholesale resistance to change. To the contrary, we view the UAS industry as rich with opportunities for personal manned aviation, with potential benefits of new participants, infrastructure, technology, and more.

In 2012, the University of Luxembourg established at the SnT an Automation & Robotics Research Group (ARG). Their main research covers sensing & control for autonomous vehicles & robots, distributed networked automation and control and engineering of complex mechatronic / cyber-physical systems. There is a lot of knowledge developed in Luxembourg about the developments in the areas of: increasing mission autonomy for S-UAV's (localisation, mapping, etc.), aerial manipulator for a new range of applications: service, inspection, logistics. Further, intruder UAV's and protection of area's against UAV, obstacle avoidance as such.

These are innovative services related to UAV which are scalable and exportable for a country as Luxembourg and contributable to the overall society.

On the other hand, we are not convinced by the societal gains of mass deployment of parcel and food deliveries to individuals.



In summary, AOPA Luxembourg and the Fédération Aéronautique Luxembourgeoise point out that:

- They fully support the creation of a sound and safe regulatory framework for U-Space and the related activities.
- New technological solutions to be required from General Aviation to become U-space cooperative must be proportional and take advantage of already existing technologies.
- An exclusion of manned aviation from certain parts of the airspace for the benefit of UAS operation would be neither desirable nor practicable and is not in line with the objective of EASA to ensure fair integration of drones with manned aircrafts.
- UAS must carry the burden to “sense and avoid” manned aircraft and other obstacles, Manned aviation traffic carrying persons shall always have priority over flying UAS robots, with no exceptions.
- service providers connected to the UTM system shall be certified and subject to oversight to ensure the safety of the system and the integrity of data.
- The environmental impact of such a mass deployment needs to be assessed, in particular high-volume traffic, noise and visual pollution;
- The rights of all persons in the range of UAV regarding their physical integrity, imaging, sensing and protection of personal data must be ensured.
- UAV need to be certified and registered. performance of the UAV related for example to manoeuvrability or to meteorological conditions must be clearly defined and classified.

The privileges of our members (Pilots and Airplane Owners and the Aeroclubs represented by the Fédération Aéronautique Luxembourgeoise to safely navigate the airspace as they currently do, will always be our priority, and a non-negotiable condition of our support for UAS integration.

Best Regards




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